



European  
Commission

# Mediterranean



Fifth Work Plan of the  
European Coordinator

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Mobility  
and Transport

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## **Disclaimer**

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## **Version**

Final

## Abbreviations

bn	Billion
CEF	Connecting Europe Facility
CINEA	European Climate, Infrastructure and Environment Executive Agency
CNC	Core Network Corridor
DG MOVE	European Commission – Directorate General for Mobility and Transport
EC	European Commission
EIA	Environmental Impact Assessment
ERTMS	European Rail Traffic Management System
ERDF	European Regional Development Funds
EU	European Union
GDP	Gross Domestic Product
IWW	Inland waterway
km	kilometre
KPI	Key performance indicator
m	metre
mm	millimetre
mn	Million
MoS	Motorway(s) of the Sea
MoT	Ministry of Transport
MTMS	Multimodal Transport Market Study
MS	Member States of the European Union
n.a.	not available / not applicable
MED	Mediterranean (Corridor)
p.a.	per year / annual
RFC	Rail Freight Corridor
RRT	Rail Road Terminal
t	tonne
TEN-T	Trans-European Transport Network
TMS	Traffic Management System
WG	Working Group
WP	Work Plan

### Country Codes after ISO 3166:

IT	Italy
FR	France
HR	Croatia
HU	Hungary
SI	Slovenia
ES	Spain
UA	Ukraine

# 1 Towards the Mediterranean Corridor 5<sup>th</sup> Work Plan

## 1.1 Introduction

The 5<sup>th</sup> Work Plan for the Mediterranean Core Network Corridor falls in a specific and tragic moment. Since the last Work Plan in September 2020, the COVID-19 pandemic triggered unprecedented movements restrictions, borders closure that led to a reduction of traffic, and serious interruptions to the supply chain. The Russian invasion in Ukraine changed dramatically the geopolitical situation in Europe and indisputably will impact our transport system. The current situation demonstrates how essential a high quality infrastructure network is for Europe, not only for its internal market but for the overall cohesion. Both the war and the pandemic showed the need for more interoperable, multimodal, connected and resilient trans-European transport network. The implications for the Mediterranean Core Network Corridor are unknown at this time. However, the conflict demonstrated a need for greater connectivity with Ukraine. Currently, our Corridor ends in Ukraine and it should remain so. The Mediterranean Corridor needs this connection and requires a reinforced effort to build a robust cross-border crossing between Hungary and Ukraine. In this context my call for maintaining the current alignment of the Mediterranean Corridor.

Since the last work plan, the European Commission issued a number of proposals with a view to keep the supply chains and transport network operating. To keep freight moving freely, a proposal on the Green Lanes initiative was adopted in March 2020 (at the start of Covid-19 pandemic).

In December 2020, the Commission proposed the **Sustainable and Smart Mobility Strategy (SSMS)**<sup>1</sup> presenting concrete actions in the field of transport to contribute to the goals set in the European Green Deal. The Strategy sets targets concerning the modal shift and travel by rail to be reached by 2030 and 2050. It outlines ways to achieve those goals including a recommendation to better align the Core Network Corridors with the Rail Freight Corridors.

In July 2021, two important legislative documents were adopted: the Connecting Europe Facility Regulation (**CEF 2**)<sup>2</sup> and the **Smart TEN-T Directive**<sup>3</sup>. The **CEF 2** describes the new financial framework for the use of EU funds in supporting the development of the TEN-T network in line with the European Green Deal objectives for the period of 2021-2027. The **Smart TEN-T Directive** sets out the streamlining measures aimed at reducing delays encountered in the implementation of TEN-T projects.

To enforce the European Green Deal, the Fitfor55 Package<sup>4</sup>, including the proposal of Regulation for alternative fuels transport infrastructure, the proposals for increasing the ambition of the EU Emissions Trading System, the ReFuelEU Aviation and FuelEU Maritime initiatives was also proposed in July 2021.

In response to tragic events in Ukraine and the need to maintain transport connectivity with our eastern neighbour (now an EU candidate country), the European Commission

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<sup>1</sup> EUR-Lex - 52020DC0789 - EN - EUR-Lex (europa.eu)

<sup>2</sup> Regulation (EU) 2021/1153 of the European Parliament and of the Council establishing the Connecting Europe Facility for the period of 2021-2027.

<sup>3</sup> Directive (EU) 2021/1187 on streamlining measures for advancing the realisation of the trans-European transport network) was formally adopted by the European Union (EU).

<sup>4</sup> EUR-Lex - 52021DC0550 - EN - EUR-Lex (europa.eu)



proposed in May 2022, an action plan for EU-Ukraine Solidarity Lanes<sup>5</sup>. The main objective to facilitate Ukraine's agricultural export. The TEN-T network remains a principal tool to achieve it.

Finally, in December 2021, the European Commission adopted a legislative proposal for a **revised Regulation for the development of the trans-European transport network (TEN-T)**. The proposal is the result of an evaluation of the existing legal framework, Member States and stakeholder consultation. The revised TEN-T Regulation shall contribute to the objectives of the **European Green Deal (EGD)** and of the **Sustainable and Smart Mobility Strategy (SSMS)**. The proposal is accompanied by an update of the 2013 TEN-T planning methodology, a report on the implementation of TEN-T during the years 2018 and 2019 as well as a communication on the extension of the TEN-T network to the EU neighbouring third countries.

In order to adequately address the objectives of the EGD and SSMS, the revision of the TEN-T Regulation aims at reinforcing the contribution of the TEN-T network to the decarbonisation and digitalisation objectives of transport policy. The revised TEN-T Regulation includes incentives to shift transport demand towards more sustainable forms of transport. The aim is two-fold:

- a) to increase the number of passengers travelling by rail through the development of a competitive and seamless high speed rail network throughout Europe; and
- b) to shift a substantial amount of freight onto rail, inland waterways, and short sea shipping.

It is important to mention that the document is the proposal of the European Commission based on its experience in implementing the TEN-T network until today. The final version, including new standards, configuration of the network, characteristics of sections will depend on the outcome of negotiations between co-legislators (European Parliament and the Council). I hope that they will be finalised by the end of 2023.

The Commission proposal introduces a number of **new or reinforced infrastructure requirements**.

- **Rail transport:** the proposal introduces the requirement of P400 loading gauge on the entire network and the extension of existing core network requirements to the entire comprehensive network (22.5 tons axle load, 740 m train length) or to the extended core network (100 km/h line speed). In addition, a minimum line speed of 160km/h is introduced for passenger lines of the core and the extended core network and the installation of ERTMS on the entire network by 2040 while decommissioning existing national class B systems is made mandatory.
- **Waterborne transport:** the revised Regulation defines a "good navigation status" through minimum requirements (2.5 m navigable channel depth and 5.25 m height under bridges) that shall be complemented by specific requirements per river-basin.

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<sup>5</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS An action plan for EU-Ukraine Solidarity Lanes to facilitate Ukraine's agricultural export and bilateral trade with the EU.

- **Short sea shipping:** shall be promoted in a wider perspective by integrating all components of the maritime dimension into a new concept called European Maritime Space.
- **Road transport:** the focus is on improving the quality of roads in order to increase road safety and to augment the number of rest areas and safe and secure parkings along the TEN-T network.
- **Multimodal freight terminals:** the proposal foresees an increase in the number of **multimodal freight terminals** along the TEN-T in order to promote multimodality.
- **Urban nodes:** the number has significantly increased, by lowering a threshold of a minimum number of inhabitants to 100.000 inhabitants. The result is that each NUTS-2 region is represented on the TEN-T map.
- **Changes to network structure:** the nine Core Network Corridors are integrated with the eleven Rail Freight Corridors in a common set of "European Transport Corridors". For the Mediterranean Corridor, this will involve a change in its alignment, including a shift in the Corridor's eastern boundary ending in Zagreb.
- **European Coordinators:** work plans will be drafted every four years, complemented by annual status reports. On their basis, the Commission shall adopt implementing acts for priority section sections. The role of Coordinators as observers in single entities for the implementation of cross-border projects shall be institutionalised.
- **New deadlines:** intermediary deadline of 2040 (extended core network) is proposed to be introduced for the new standards on the core network and for advancing the existing standards to the comprehensive network, notably the development of ERTMS.

My Work Plan aims to present the state of implementation of the Mediterranean Core Network Corridor. For the first time, it assess state of implementation of sections that were added to the Corridor following the adoption of the CEF II Regulation. My ambition is to show good examples of progress achieved, to focus on current and future compliance issues within the MED Corridor, to inform about the state of implementation with regard to key standards agreed by the TEN-T Regulation, to list remaining challenges and persistent bottlenecks that have to be addressed if we want to achieve a full compliance of the network along the Mediterranean Corridor by 2030. Finally, I present the most important recommendations regarding implementation, financing and funding of projects.

As previous Work Plans, this document takes into account results of the many discussions and exchanges with ministers, officials and stakeholders from the Corridor countries.

Recognising the importance of continuing to engage in dialogue, we have adapted to the situation through the remote organisation of the 15<sup>th</sup> and 16<sup>th</sup> Corridor Forum Meetings (March and November 2021), as well as three working group meetings on the impacts of COVID-19 (December 2020) and a discussion on challenges in completion of the the corridor by 2030 (May 2021), the extension of the MED CNC (November 2021). As the pandemic conditions improved, two working groups, with physical presence, were organised with regard to respectively freight (March 2022) and passenger (June

2022) transport along the Mediterranean Corridor while the 17<sup>th</sup> Corridor Forum Meeting is planned for September 2022.

In addition, many discussions with the European Coordinator on the challenges of rail took place on board the **Connecting Europe Express**, in September 2021. This train travelled for 36 days across 26 countries and visited many cities situated along the Mediterranean Corridor.

This Work Plan is the last one adopted under the current TEN-T Regulation but the first one which evaluates state of implementation of new transport sections added following adoption of the CEF II Regulation<sup>6</sup>.

The overall objective remains unchanged. The aim is to develop and complete a competitive and interoperable TEN-T network at highest standards. The way of achieving it is nevertheless adapted proposing a gradual approach developed in three steps: the core network by 2030, the extended core network by 2040 and the comprehensive network by 2050 (as reflected in the Commission's proposal on revised TEN-T guidelines).

I try to adapt each work plan to new realities in order to capture better political priorities of the European Commission. Therefore, in this document a reader will also find comments and analysis related to the deployment of alternative fuels along the Corridor, the development of urban nodes, the Green Deal, the contribution of the Recovery and Resilience Fund, and the inclusion of military mobility in the network development.

This report is a result of collaborative efforts of the Member States and the European Commission.

Over the past two years progress was made despite the COVID pandemic which interfered with planning and construction processes due to lockdowns, interrupted supply chains, and increasing prices for transport services.

I would like to thank the Mediterranean Corridor members for their efforts that made this progress possible.

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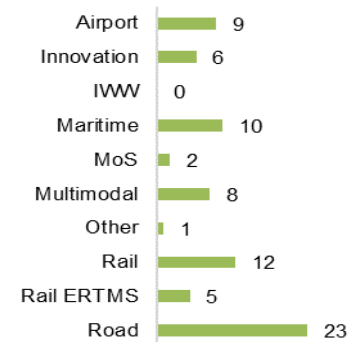
<sup>6</sup> <https://eur-lex.europa.eu/eli/reg/2021/1153/oj>

## 1.2 Achievements along the Corridor

Since the last Work Plan published in September 2020, 76 projects have been fully completed on the Corridor. Thirteen of them contributed to the full achievement of compliance with TEN-T standards as indicated in the map below<sup>7</sup>.



**Figure 1: Projects completed since the 4<sup>th</sup> Work Plan (adopted on August 2020) until 30.06.2021, by country, with requirements achieved**



**Figure 2: Projects completed since the 4<sup>th</sup> Work Plan to 30.06.2021, by category**

I would like to mention some of the common success stories we achieved so far on the Mediterranean Corridor:

- Zidani Most – Celje upgrade aimed at the fulfilment of all TEN-T standards in accordance with compliance with the TEN-T Regulation 1315/2013, in particular regarding line speed of 100 km/h, axle load of 22.5 ton and the accomodating of 740m trains. The works on the Zidani Most-Rimske Toplice section, was completed in May 2021. The overall completion is expected in 2023.
- The M70 expressway section between Letenye and Tornyiszentmiklós crossing the Hungarian and Slovenian border opened for traffic in December 2019.
- The demolition and reconstruction of the (E80) Polcevera motorway viaduct in Genoa following its collapse on 14 August 2018. The accident led to a severe bottleneck in Genoa with huge inconveniences both for motorway flows and for the city road system. The work was completed in August 2020. The length of the reconstructed infrastructure was approximately 1,100 metres, with a height of approximately 30 metres.
- Wide range of investments continued in Spain. They included civil works and preparatory administrative procedures (studies, project preparations etc...). In 2020, the main achievements include the implementation of mixed gauge in several stations in the Castellón area, as well as in the Castellbisbal-Martorell section (including the branch to the Seat car factory) and between Sant Vicenç de Calders and the Vila-seca junction. Urban integration works, progressed both in Murcia and Almería with the digging of tunnels in Santiago el Mayor, Senda de los Garres and El Puche. Track renewal works have also been completed on the Algeciras-Almoraima section (Algeciras-Bobadilla railway line) and in San Roque station, allowing the circulation of 740-metre-long trains. In 2021, progress is notable with Sagunto-Teruel Zaragoza railway line, the main achievements

<sup>7</sup> Cut-off date for the database analysed - June 2021.

include the awarding of electrification works between Zaragoza and Teruel and further modernisation of the line, including the renewal of sleepers, new sidings, the increase in axle load, the improvement of safety and the upgrade of the signalling system in the Monreal del Campo-Sagunto and Bifurcacion Teruel-Caminreal sections. All these elements will lead to increased capacity of the line.

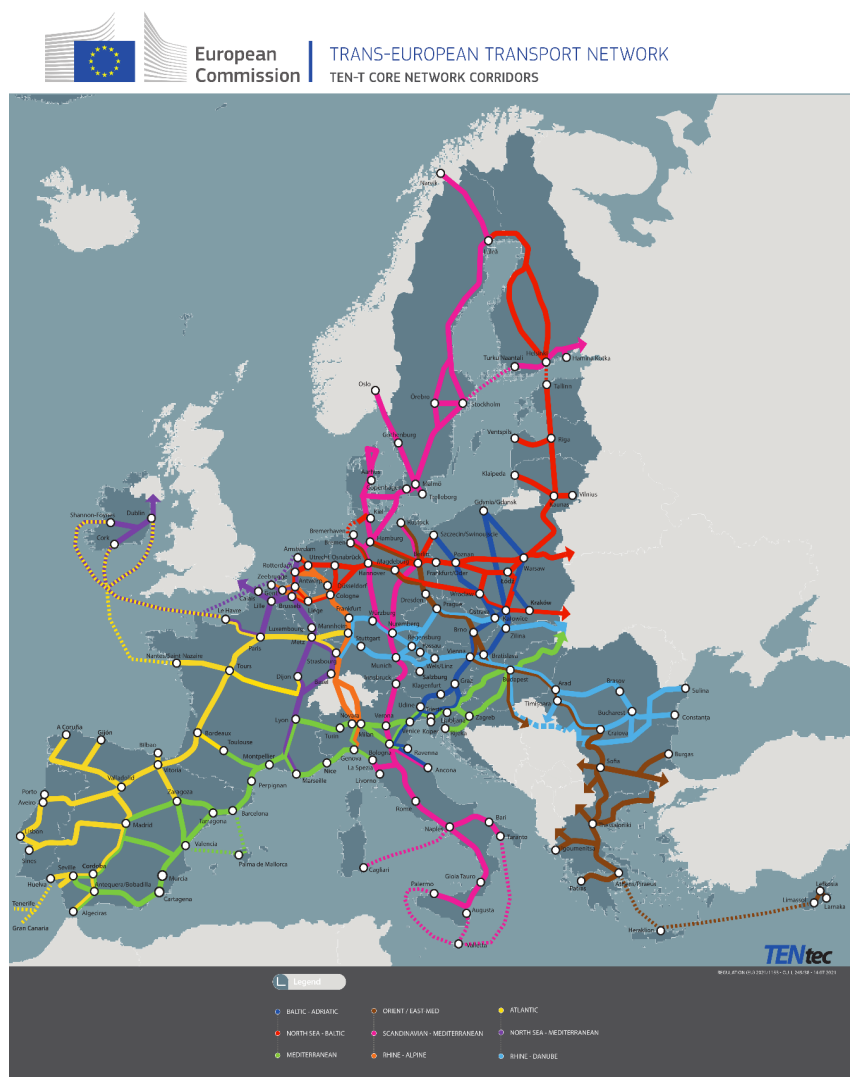
- The development of a multimodal platform with interconnection to Adriatic Gate container terminal, reconstruction of Rijeka-Brajdica railway station and establishment of intermodal yard in the port of Rijeka.
- Works are on-going in Lyon for the improvement of the railway node, with a first phase to be finished in 2023. The works include a complete restructuration of the Lyon Part-Dieu station and multimodal hub, a new track with platform and several operational and safety improvements. This is of particular importance since Lyon Part-Dieu is one of the major railway hubs in Europe, hosting new international high-speed services. Studies are also on-going to further define the long-term works to be done in the railway node, with the perspective of major capacity increase.

## Characteristics of the Corridor

### 1.3 The new alignment under CEF 2

The **Mediterranean Corridor** is one of the TEN-T Core Network Corridors (CNC) depicted in Figure 3 (green line), linking the ports in the south-western Mediterranean region to the centre of the EU, following the coastlines of Spain, France, and crossing the Alps towards the east. It runs across northern Italy and continues east, through Slovenia, Croatia and Hungary up to the Ukrainian border.

Several segments of the MED Corridor overlap with other CNC's, including the Atlantic, North Sea – Mediterranean, Rhine – Danube, Rhine – Alpine, Orient/East - Mediterranean, Scandinavian-Mediterranean and Baltic-Adriatic corridors, making it one of the most interconnected in Europe.



**Figure 3: The 9 TEN-T Core Network Corridors**

As a result of CEF II Regulation (2021 – 2027)<sup>8</sup>, the Mediterranean Corridor was extended in Spain, France and Italy and reached the total length of 11410 km.

<sup>8</sup> <https://eur-lex.europa.eu/eli/reg/2021/1153>

The Corridor is composed of the following branches:

- Algeciras – Bobadilla – Madrid – Zaragoza – Tarragona;
- Madrid – Valencia – Sagunto – Teruel – Zaragoza;
- Sevilla – Bobadilla – Murcia;
- Cartagena – Murcia – Valencia – Tarragona/Palma de Mallorca - Barcelona;
- Tarragona – Barcelona – Perpignan – Narbonne – Toulouse/Marseille – Genova/Lyon – La Spezia/Torino – Novara – Milano – Bologna/Verona – Padova – Venezia – Ravenna/Trieste/Koper - Ljubljana – Budapest;
- Ljubljana/Rijeka – Zagreb – Budapest – UA border.

New sections include:

In **Spain**, the rail network is extended including the high-speed lines Zaragoza – Teruel – Sagunto and Madrid – Valencia, as well as the conventional line Alcazar de San Juan – La Encina. Accordingly, the MED road network in Spanish territory is extended to include the Madrid – Valencia and Zaragoza – Teruel – Sagunto road sections.

In **France**, the new alignment provides for the addition of the Toulouse – Narbonne and Marseille – Ventimiglia rail and road sections.

Finally, in **Italy** several sections are added to the Mediterranean Corridor including the Ventimiglia – Genova, the Genova – La Spezia – Novara and the Milano - Bologna lines.

The MED Corridor extends also in terms of nodes, adding 10 core nodes distributed per mode of transport as follow:

- Ports: Palma de Mallorca, Genova and La Spezia;
- Airports: Palma de Mallorca, Genova;
- RRT: Toulouse;
- Urban nodes: Palma de Mallorca, Toulouse, Nice and Genova.



Figure 4: MED CNC Alignment under revised CEF Regulation (EU) 2021/1153

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

TEN-T Regulation (EU) 1315/2013 puts forward binding minimum infrastructure targets for the Core Network Corridors' transport infrastructure that need to be met by December 2030. The monitoring is assured by Key Performance Indicators (defined for all modes of transport). This section provides an update on current compliance (as of June 2021).

### Rail compliance

**Electrification** is ensured on almost all of the Corridor's railway lines, except Bobadilla-Algeciras and Zaragoza – Teruel - Sagunto. General problem of the Corridor is the use of 3 voltage systems. It raises the issue of interoperability, a point particularly visible at the cross-border sections:

- 1.5 kV DC (on conventional lines in France),
- 3kV DC (on conventional lines in Spain, Italy and Slovenia),
- 25kV AC (on high-speed lines in France, Spain and Italy; conventional lines in Croatia and Hungary).

**Track gauge** remains one of the main challenges. France, Italy, Slovenia, Croatia and Hungary feature the 1435 mm standard UIC gauge, whereas in Spain, the standard gauge (used on the high-speed lines) coexists with the Iberian gauge 1668 mm. This operational incompatibility is being addressed in Spain by putting in place a long-term investment plan with the objective of expanding the UIC gauge along the Mediterranean Corridor. The investments are ongoing or planned on most of the conventional lines of the Corridor. Several technical solutions are applied depending on the case: the installation of mixed gauge, the upgrade to UIC gauge, or the construction of new UIC gauge lines, such as the new high-speed line between Antequera and Granada, in operation since June 2019.

The Corridor's railway infrastructure allows the required **axle load** of 22.5 t on almost all the sections in Spain, Italy, Croatia, Slovenia and France, while limitations still exist on some Hungarian sections.

A **train length** of 740 m is only allowed on the French and Slovenian network, where, however, operational interventions may be required to operate trains of this length regularly, on a large part of the Hungarian network and on certain limited sections of the Spanish and Italian networks. On the rest of the Corridor, various train length restrictions apply, allowing a train length between 400m and 700m. This poses a problem of interoperability.

The required minimum **line speed** of 100 km/h for freight lines is achieved on the existing network in Spain, France, Italy, Croatia and Hungary, while limitations still exist on some Slovenian rail sections.

The map below summarizes graphically the railway parameters of "Electrification", "Track gauge = 1,435 mm", "Axle load ≥ 22.5 tons" and "Line speed ≥ 100 km/h". The map shows only existing lines and not missing links. Missing links are however represented on 2030 compliance map.



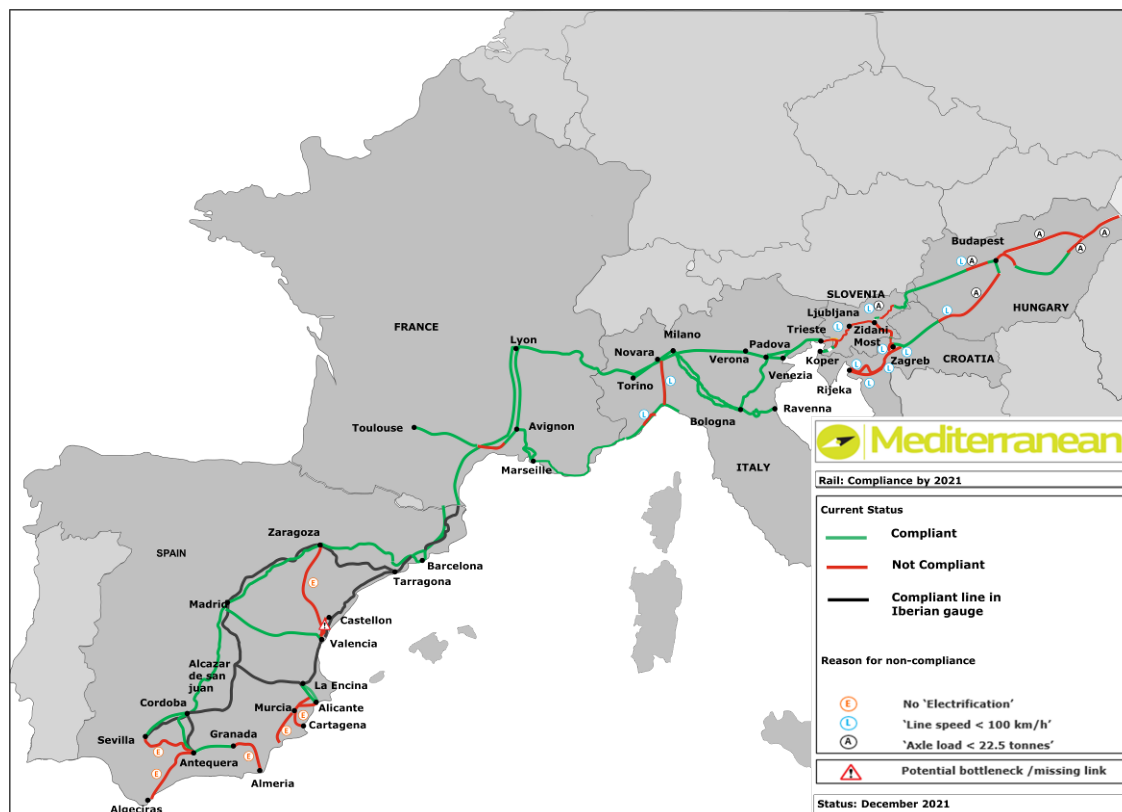


Figure 5: Rail compliance map by 2021 overview (current status)

### Rail Road Terminals compliance

The Mediterranean Corridor includes 20 core RRTs:

- 7 in Spain (Alcazar de San Juan, Antequera, Barcelona, Cordoba, Madrid, Murcia and Zaragoza);
- 3 in France (Avignon, Lyon and Toulouse);
- 7 in Italy (Bologna Interporto, Cervignano, Milano smistamento, Novara, Orbassano, Padova and Verona);
- Single terminals in Zagreb, Ljubljana and Budapest.

In this case and following the infrastructure requirements (Articles 28 and 39 of Regulation (EU) 1315/2013, the Key Performance Indicator (KPI) is defined as the **capability of handling all types of intermodal loading units and the accessibility for long trains and electrified access.**

In the year 2021, 17 terminals are able to satisfy the requirement. Projects are planned in order to ensure compliance in 2030 in the terminals of Antequera and Ljubljana.

The **accessibility for long trains** (740 m), is ensured by 11 RRTs in 2021 (Barcelona, Madrid, Murcia, Zaragoza, Bologna Interporto, Cervignano, Milano Smistamento, Novara, Orbassano, Padova and Budapest). Several other projects are planned in order to meet the KPI within 2030.

Finally, 14 terminals guarantee an **electrified access**. This standard is missing in Antequera, Barcelona, Ljubljana, Verona, Zagreb and Murcia.

## Inland Water Ways compliance

The Inland Waterways system belonging to the Mediterranean Corridor consists of:

- 9 inland ports (Sevilla, Marseille/Fos-Sur-Mer, Lyon, Cremona, Mantua, Venice, Trieste, Ravenna and Budapest);
- the Rhône river, between Lyon and Fos sur Mer, with extensions to the Port of Sète (by the “canal du Rhône à Sète”) and to the north (outside the Corridor) with the Saône river until Chalon-sur-Saône;
- the Po river and the IWW system of northern Italy, connecting the inland ports of Cremona and Mantua to Ferrara/Porto Garibaldi and Venice/Porto Nogaro/Monfalcone;

About 80% of the IWW network of the Corridor meet TEN-T requirements. The non-compliant sections include Pavia-Casale Monferrato and Piacenza - Pavia covering about 150 km, where the minimum width is about 8 m instead of 9.5 m and a short IWW section leading to Sete.

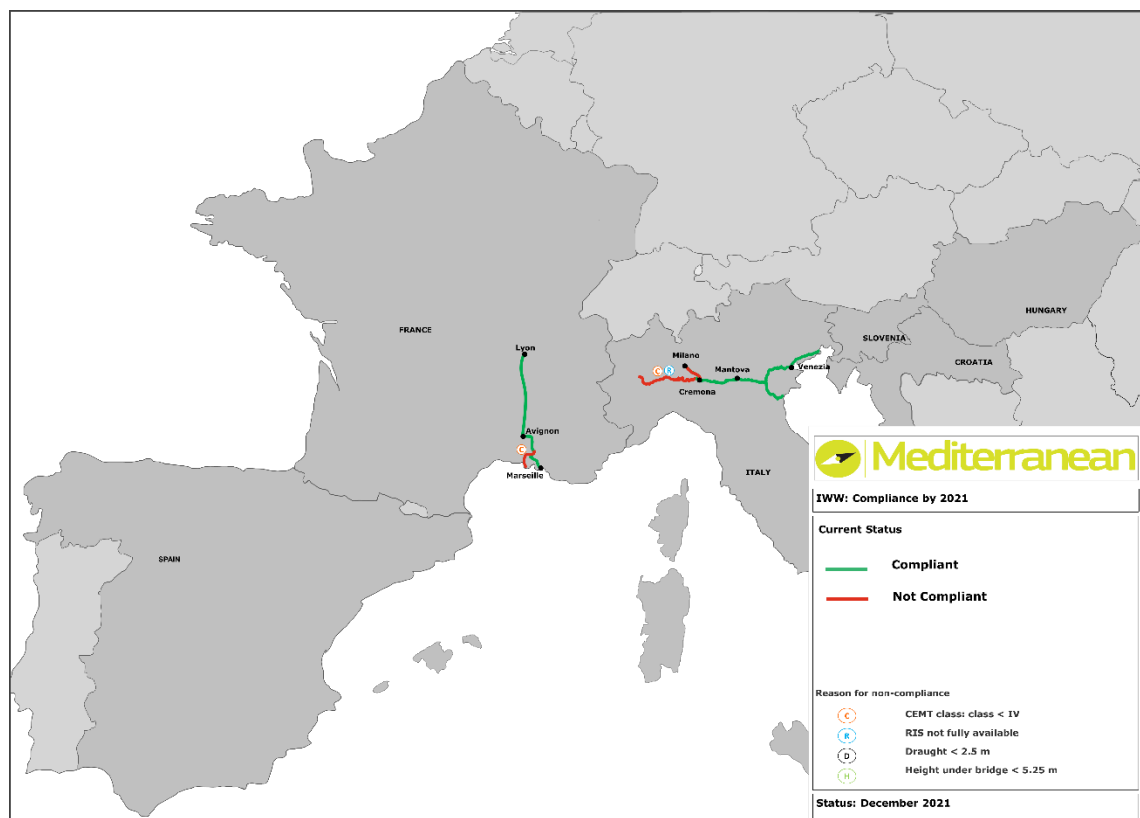


Figure 6: IWW compliance map by 2021 overview (current status)

## Road compliance

The road network included in the Mediterranean Corridor – after the CEF II Regulation entered into force – is about 7,300 km, with Spain covering about 50% of the entire Corridor.

As regards the parameter “**Motorway or Express roads**” only a few kms are not compliant such as the Hungarian sections close to the Ukrainian border. Actually the missing express road links between HU and UA is the main missing road link of the Corridor crossing an EU external border.

## Ports' compliance

There are 15 core ports in the Mediterranean Corridor, mainly located in the western part of the Corridor: Bahía de Algeciras, Sevilla, Cartagena, Valencia, Tarragona, Barcelona, Palma de Mallorca, Marseille/Fos-sur-Mer, Genova, La Spezia, Ravenna, Venezia, Trieste, Koper and Rijeka.

For these ports, Regulation (EU) 1315/2013 requires the **connection to the rail network by 2030**. All ports are reported to be already fully compliant with respect to this parameter. Nevertheless, several ports are further improving the rail connection with a view to improving the rail hinterland connection and thereby increasing possibilities for modal shift. For example:

- the investment in Valencia to improve the rail connection within the port's terminals and the Corridor for UIC gauge trains of maximum length of 750m;
- the new railway south access to Barcelona Port;
- the construction of additional rail connecting infrastructure network within the port of Koper;
- the port of Trieste (upgrading the port railway system inside and outside the port area);
- the port of Ravenna (Ro-Ro terminal and railway link).

## Airport compliance

The Mediterranean Corridor comprises 21 core airports:

- 7 are located in Spain (Valencia, Alicante-Elche, Sevilla, Málaga-Costa del Sol, Josep Tarradellas Barcelona-El Prat, Adolfo Suárez Madrid – Barajas and Palma de Mallorca);
- 4 airports are in France (Lyon Saint-Exupery, Marseille-Provence, Toulouse and Nice);
- 7 in Italy (Genova - Sestri, Bergamo-Orio al Serio, Milano – Malpensa, Milano – Linate, Venezia – Tesserà, Torino – Caselle, Bologna – Borgo Panigale);
- and one each in the capitals of Slovenia, Croatia and Hungary.

Out of these 21 airports, six are considered main airports in the meaning of Regulation (EU) 1315/2013, and thus subject to the provisions of Art 41(3), which requires the **connection to the trans-European transport network by 2050**, wherever possible: Adolfo Suárez Madrid-Barajas, Josep Tarradellas Barcelona-El Prat, Lyon, Malpensa, Linate and Budapest.

According to EU guidelines only airports having direct rail services linking the airport with high-speed lines or long distance TEN-T railway lines shall be considered as properly "connected with rail". Local or regional/suburban rail connections, although improving accessibility, are not sufficient for the full compliance with the Regulation. Under such assumption, only Lyon and Milano Malpensa airport can be considered currently as directly connected to high-speed rail.

Several projects are planned in order to improve airport accessibility on the Corridor:

- for Genova, Bergamo and Venezia airports a project has already been approved, with works expected within 2030;
- for Linate, a project planning to connect the airport with the underground line (Metro Line 4) is being implemented and is expected to be completed by 2022;

- a new long-distance train station is foreseen at Nice airport within the Provence Cote d'Azur new rail line project, and a metro (Toulouse aerospace express) is also in project connecting Toulouse airport and main railway station of Toulouse (Matabiau);
- for Adolfo Suárez Madrid-Barajas airport, the high-speed rail connection to Chamartín station is expected for 2030.

## 1.5 Evolution over time of the KPI's per Member State

### KPI Analysis

With the the addition of new links to the MED Corridor, it is an opportune moment to take a look at the collective results achieved so far in terms of the compliance of its network with the technical parameters of the TEN-T Regulation.

Accordingly, Table 1 presents the compliance percentage of the technical parameters per Member State in 2021. The level of compliance is calculated as the percentage of the applicable length of the network that fulfils each technical parameter. This means that KPIs that are applicable only to freight lines (e.g. axle load or train length) are calculated over the length of the network with mixed or freight use, not the total length of the railway network.

These values can be compared with those shown in Table 2 refers to the year 2015, published in the Mediterranean Corridor Work Plan of December 2016. A first analysis shows that there has been a slow but clear improvement in the compliance status of the network in terms of rail and road parameters. The situation is unchanged in terms of rail connection for airports, with only Lyon airport currently compliant, and in terms of IWW where the compliance status has remained unchanged.

It should also be mentioned that the 2021 KPIs analysis considers the characteristics of the Mediterranean Corridor including also the new sections and nodes added to the CNC due to the entry into force of CEF Regulation (EU) 2021/1153, so the comparison should be made with caution.

**Table 1: Compliance per Member States with TEN-T requirements by 2021**

KPI	Member State						Total	
	ES	FR	IT	SI	HR	HU	2021	2030
<b>Railways</b>								
Electrification	84%	100%	100%	100%	100%	99%	<b>92%</b>	<b>100%</b>
Track gauge	100% <sup>9</sup>	100%	100%	100%	100%	99%	<b>71%</b>	<b>84%</b>
Axle load	94%	100%	100%	100%	100%	27%	<b>91%</b>	<b>100%</b>
Line speed	100%	97%	92%	41%	100%	92%	<b>93%</b>	<b>99%</b>
Train length	17%	100%	4%	100%	0%	67%	<b>38%</b>	<b>72%</b>
<b>IWW</b>								
CEMT class	-	77%	80%	-	-	-	<b>79%</b>	<b>88%</b>
Draught > 2.5 m	-	100%	80%	-	-	-	<b>88%</b>	<b>93%</b>

<sup>9</sup> This percentage of Spanish rail MED Corridor applies only to lines built after the approval of the Regulation (2013) since pre-existing lines are exempt of being upgraded to UIC. All New lines are built in UIC or prepared for gauge migration. This does not mean 100% of the Spanish MED Corridor is physically in UIC gauge. The percentage of the network physically with UIC gauge in 2021 would be 43%.

KPI	Member State						Total	
	ES	FR	IT	SI	HR	HU	2021	2030
Bridge height	-	63%	70%	-	-	-	<b>67%</b>	<b>82%</b>
RIS	-	96%	62%	-	-	-	<b>75%</b>	<b>75%</b>
<b>Road</b>								
Type	100%	100%	100%	100%	100%	97%	<b>100%</b>	<b>100%</b>
<b>Ports</b>								
Rail connection	100%	100%	100%	100%	100%	100%	<b>100%</b>	<b>100%</b>
<b>RRT</b>								
Capability of intermodal units	71%	100%	100%	0%	0%	100%	<b>81%</b>	<b>90%</b>
740 m train terminal accessibility	57%	0%	75%	0%	0%	100%	<b>55%</b>	<b>65%</b>
Electrified train terminal accessibility	57%	100%	75%	0%	0%	100%	<b>67%</b>	<b>67%</b>
<b>Airports*</b>								
Connection to rail – all airports	57%	50%	43%	0%	0%	0%	<b>43%</b>	<b>67%</b>
Connection to rail (HS) - main airports	0%	100%	50%	-	-	0%	<b>33%</b>	<b>67%</b>

\* The KPI "Connection to rail – all airports" has been calculated considering all the airports of the core network directly connected with the railway network. The compliance value in 2021 decreases to 33% when applying the more restrictive criterion of rail connection with high-speed lines for the main airports of the core network (Connection to rail (HS) – main airports) with only Lyon and Milano Malpensa airports currently compliant. By 2030 all main airports will be compliant with this KPI except for Budapest airport where completion of the work is in doubt and Milano Linate for which an underground connection is planned (67%).

**Table 2: Compliance with TEN-T requirements by 2015 – Extract from Mediterranean Corridor Work Plan (December 2016)**

Parameter	2015
<b>Railways</b>	
Electrification	<b>92%</b>
Track gauge 1435 mm	<b>72%</b>
Axle load ( $\geq 22.5$ t)	<b>76%</b>
Line speed ( $\geq 100$ km/h)	<b>92%</b>
Train length (740 m)	<b>23%</b>
ERTMS implementation	<b>13%</b>
<b>Road</b>	
Type	<b>98%</b>

Breaking down the monitoring of KPIs at country level will better highlight where problems exist, particularly when it comes to the state of the rail infrastructure, which currently presents the main criticalities.

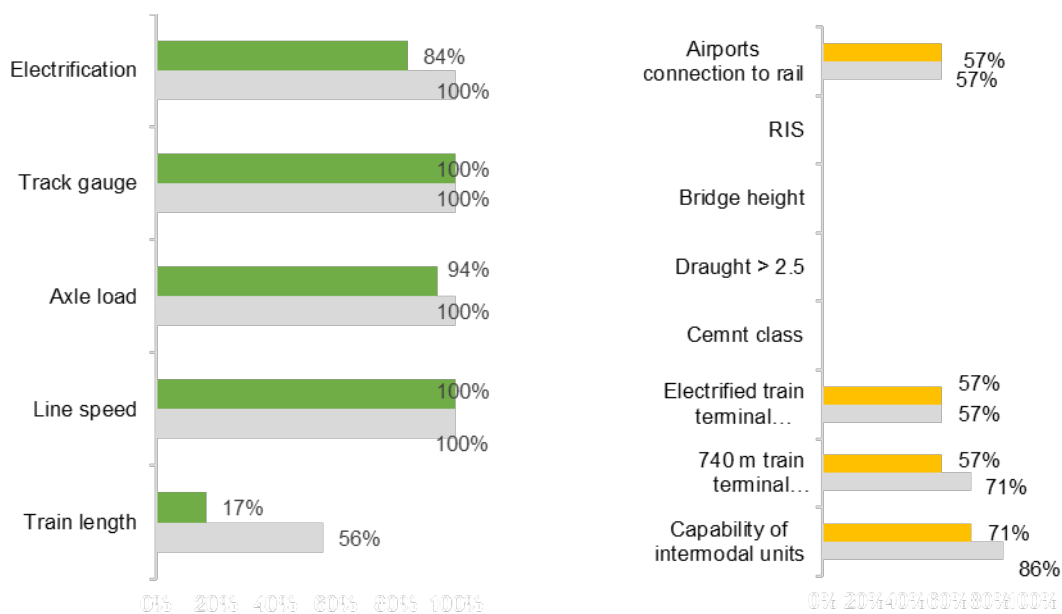
### Spain

**Electrification** lacks on sections Bobadilla-Algeciras and Zaragoza – Teruel – Sagunto, where compliance is planned for 2030. The required **axle load** of 22.5 t is allowed on almost all the sections in Spain as well as the required minimum **line speed** of 100 km/h for freight lines.

**Track gauge**, all lines will be compliant in 2030. However, it does not mean that all lines belonging to the Corridor will have international gauge. This is because pre-existing lines in Iberian gauge (prior to the approval of Regulation 1315/2013) are exempted from meeting this KPI.

Spain will be compliant with all rail KPI's in 2030 except for **train length** (expected level of compliance by 2030 of 56%). Currently only the conventional line Madrid-Valencia and the section between Barcelona and the French border can accommodate trains up to 740m long.

In terms of connectivity of nodal infrastructures to the Corridor, the **rail connection** between the airports and the railway network is currently poor in Spain (0% compliance for main airports), but major investments are being made in this area. It is worth mentioning the approval of the first phase of information study for the high-speed rail link of Adolfo Suarez-Madrid Barajas airport, and ongoing preparation of new access to El Prat airport in Barcelona. In terms of investments aimed at improving accessibility of **RRTs** works have been awarded for the rail link to the La Llagosta standard gauge multimodal terminal.



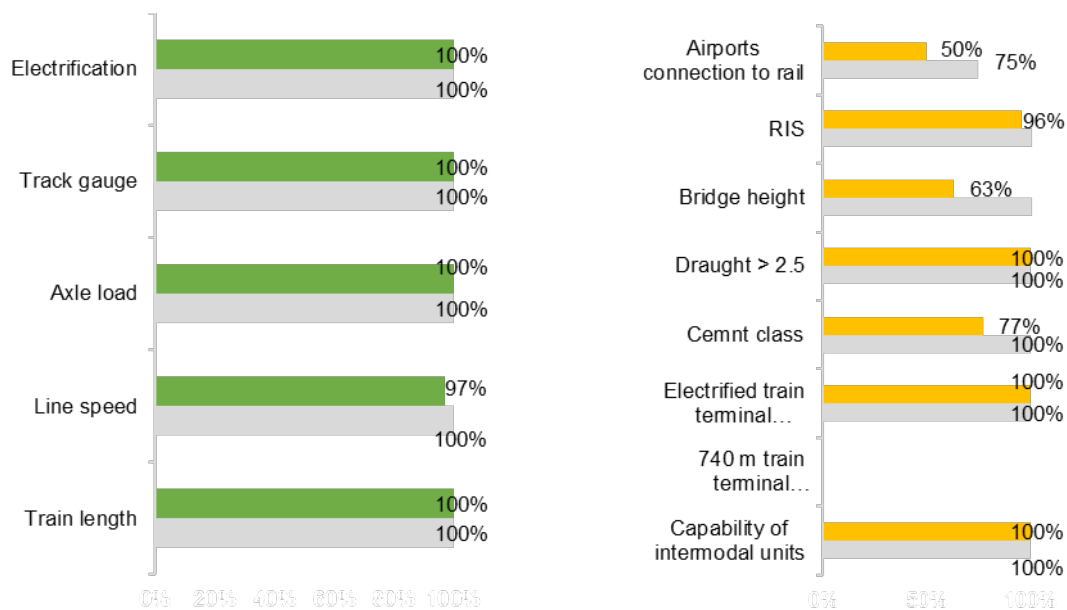
**Figure 7: Compliance with TEN-T requirements by 2021 and 2030 – Spain**

## France

Except for ERTMS, all rail sections of the French network of the corridor are compliant with the main TEN-T requirements, reaching a 100% compliance rate by 2021 in terms of **electrification, track gauge, axle load and train length**.

The required minimum **line speed** of 100 km/h for freight lines is achieved on the 97% of the rail sections, excluding the cross-border section with Italy (Border FR/IT IT <--> Menton and Menton <--> Nice).

Main issues concern timely ERTMS deployment, improved performance and capacity of RRTs.



**Figure 8: Compliance with TEN-T requirements by 2021 and 2030 – France**

## Italy

KPIs concerning **electrification**, **axle load** and **track gauge** reached full compliance.

The required minimum **line speed** of 100 km/h for freight lines is achieved on 92% of the railway network. Non-compliant sections include border sections with Slovenia (Border IT/SL IT / Sezana II - Villa Opicina) and some sections of the Genova node (Genova Sampierdarena – Genova P. Principe and Genova Voltri – Genova Sampierdarena). The use of such sections by freight trains will be reduced by the operation of the Giovi Pass (2024/2025) which will cause a rerouting of a significant share of freight trains on other sections of the Genova Node, reaching the target.

A **train length** remains a problem. 740 m trains are only allowed on 4% of the Italian network, with a limited number of already compliant sections located in Northern Italy.

A large number of investments is ongoing. Works on the cross-border sections Turin-Lyon and on the high speed railway link Terzo Valico dei Giovi foresee the achievement of all the railway KPIs. In addition, the new high-speed lines (Milano – Brescia – Verona – Vicenza – Padova), are expected to achieve all the railway KPIs. Other relevant planned works include the upgrading of some sections of the Mediterranean Corridor (Torino – Milano, Verona - Padova – Venezia, Venezia – Trieste, Bologna – Padova, Milano - Piacenza – Bologna, Genova – Ventimiglia) to 750 m train length.

Further efforts are required in terms of connectivity of nodal infrastructure to the Corridor. Several projects are planned to improve **airport accessibility**, including Genoa, Bergamo and Venezia airports, where accessibility upgrades are expected to be completed in 2030, and Linate, where the connection of the airport with the metro line (Line 4) is under construction and expected to be completed by 2022.

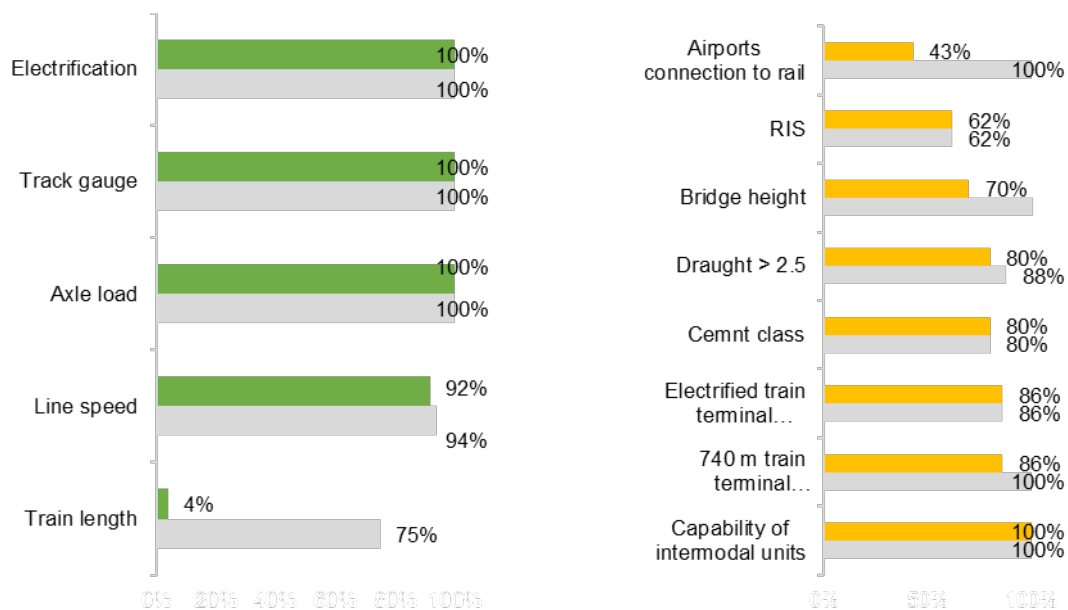


Figure 9: Compliance with TEN-T requirements by 2021 and 2030 – Italy

## Slovenia

**Line speed** represents the only category, which is currently not compliant. It will be achieved after the completion of the second track between Koper and Divača, as well as the upgrade of the section Zidani Most - Dobova.

As regards **train length**, while it is possible for trains 740m long to operate on the Slovenian railway network, certain operational measures or interventions may be required. In order for trains of this length to be able to operate regularly, further investments are needed in the future in railway sidings and in adapting of the signal safety devices.

Another pending issue is the completion of **cross-border sections** with Italy and Croatia. They are, in part, dependant on the agreement with other member states and the works, which can/will be conducted in these countries by 2030.

Among other critical issues, the Ljubljana RRT is not compliant with the KPIs "**Intermodal transshipment capacity**", "**Accessibility of the 740 m rail terminal**" and "**Accessibility of the electrified rail terminal**". However, by 2030 the Ljubljana container terminal is expected to be upgraded and modernised to meet the intermodal KPIs.



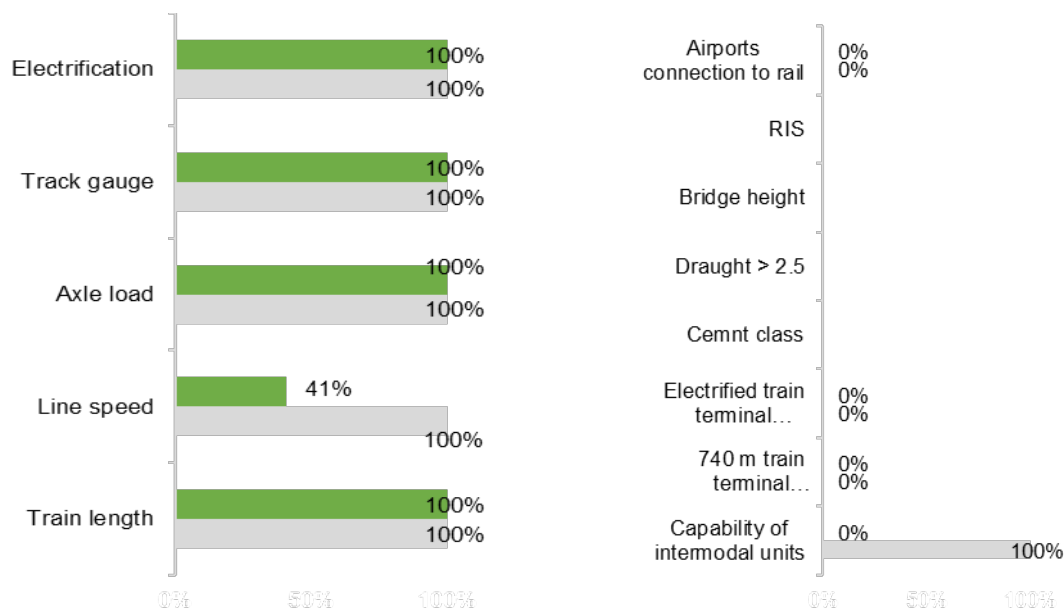


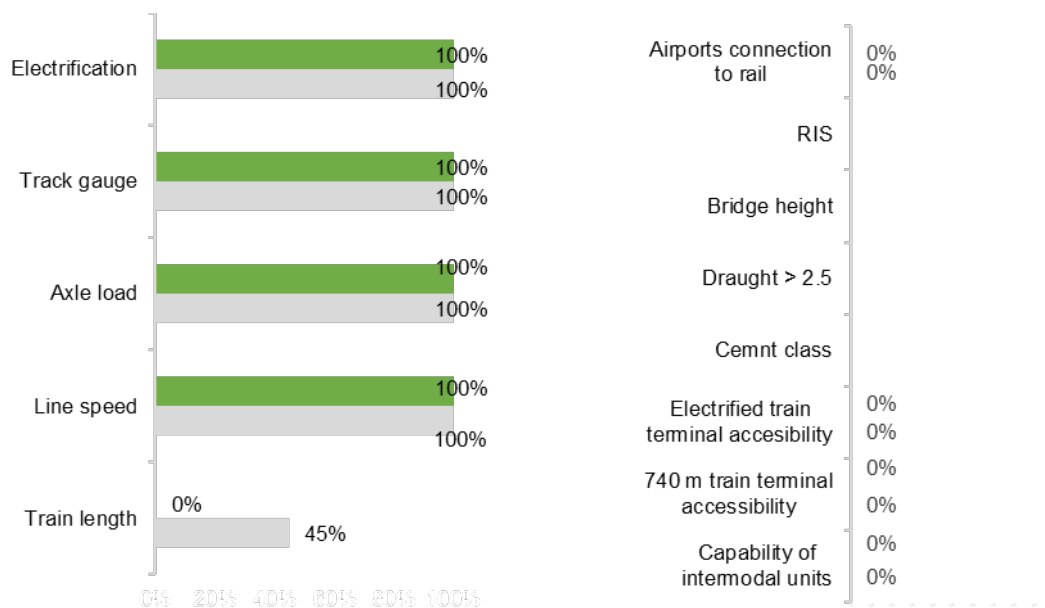
Figure 10: Compliance with TEN-T requirements by 2021 and 2030 – Slovenia

### Croatia

According to the data currently available, the Croatian network is already compliant with all railway KPIs, achieving a 100% compliance rate in terms of **electrification**, **track gauge**, **axle load** and **line speed**, except for the **train length** parameter which has currently a compliance level of 0%. Various restrictions are applied on the railway network, allowing a train length between 200 m and 500 m.

By 2030, different railway lines are scheduled to be upgraded including the sections Horvati <--> Karlovac and Dugo Selo <--> Botovo, for which the "train length" parameter will also be met. The level of compliance thus rises to 45%.

Major problems are identified in relation to rail links between **airport** nodes and the central rail network and **RRTs**. Zagreb airport, although belonging to the 21 core airports, is not one of the 6 considered to be major airports within the meaning of Regulation (EU) 1315/2013, and therefore subject to the provisions of Article 41(3), which requires connection to the trans-European transport network by 2050. On the other hand, in terms of "**Intermodal transshipment capacity**", "**Accessibility of the 740 m rail terminal**" and "**Accessibility of the electrified rail terminal**", the Zagreb intermodal terminal is currently not compliant with these KPIs although some investments are in the pipeline by 2030.



**Figure 11: Compliance with TEN-T requirements by 2021 and 2030 – Croatia**

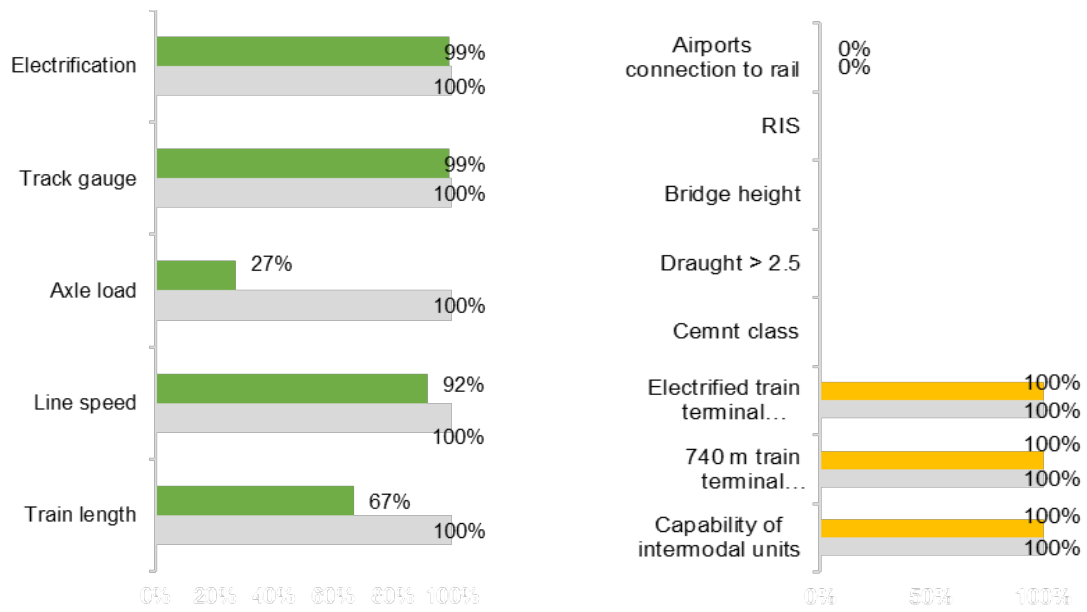
## Hungary

The most problematic KPIs are the **axle-load** and **train length** parameters. Most railway sections are ready for 21 tonnes compared to the 22.5 tonnes required by European standards. However, 22.5 tonnes may be allowed under special conditions (speed reduction and restrictions, etc.). The percentage of sections complying with the train length standard is 67%. On the non-compliant sections, restrictions are in place on the circulation of 740 long trains, with limitations up to 600/650 m. However, for both the parameters analysed, full compliance (100%) is expected by 2030.

The compliance status of the Hungarian network with respect to the **maximum speed** parameter is 92% at the current status. Non-compliant sections are Budapest Ferencvaros <--> Cegled where the maximum speed is 80 km/h between Ferencváros and Kőbánya-Kispest, between Kőbánya-Kispest and Cegléd it is 100 km/h and Murakeresztur <--> Gyekenyes (part 2) with speed limitations of 80 km/h on part of the section.

**Electrification** and **track gauge**, the compliance rate is 99%.

In terms of connectivity of nodal infrastructure to the Corridor, the Budapest Liszt Ferenc International airport is not yet connected to the main Hungarian railway passenger network (while the freight train connection is ready). However, this bottleneck is expected to be eliminated with the construction of a rail link providing good connection between the airport, Budapest city centre and several other destinations.



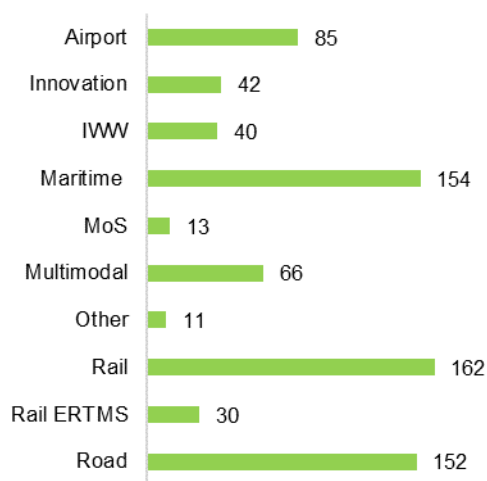
**Figure 12: Compliance with TEN-T requirements by 2021 and 2030 – Hungary**

## 2 Inventory of what has still to be realised by 2030

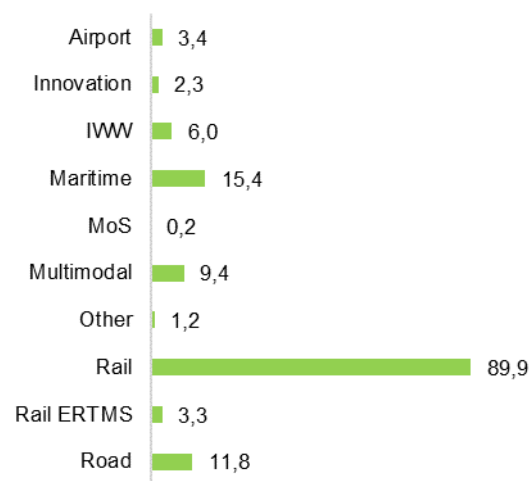
### 2.1 General description

The following chapter discusses the investments required for the development of the Mediterranean Corridor infrastructure by 2030 addressing the main problems and issues.

The analyses reported below are based on the 2021 Project List (projects necessary for the full completion of the Corridor), updated in cooperation with national and regional authorities, infrastructure managers and other relevant stakeholders. The time horizon of the project list is 2030. By the reporting date of 2021, 755 projects are included in the MED Project list. They can be categorized as shown in the graphs below.



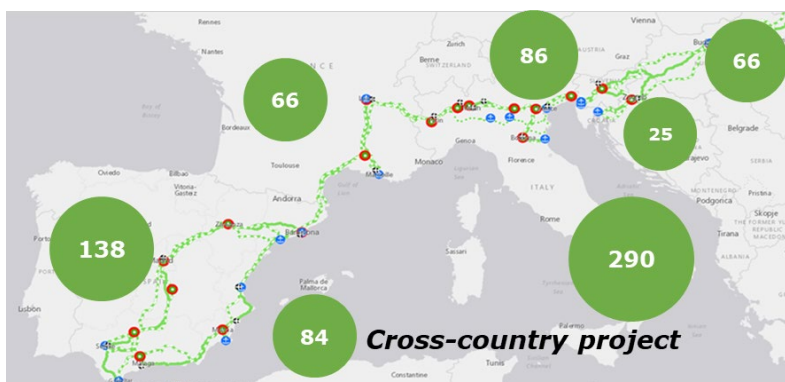
**Figure 13: Total number of projects per each project category**



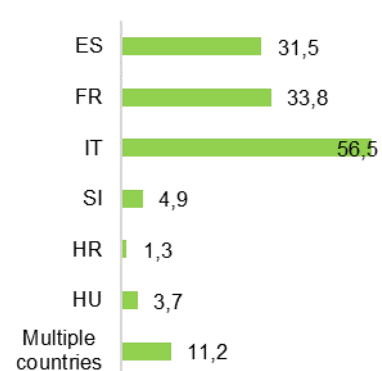
**Figure 14: Total cost of projects (€ billions) per each project category**

As represented in the figure above, rail is by far the most represented mode in the Project list for the Corridor, with about 25% (rail and ERTMS) of projects addressing necessary works (€ 93.2 billion).

The global number of projects and the cost per each MS are shown in the following figures.



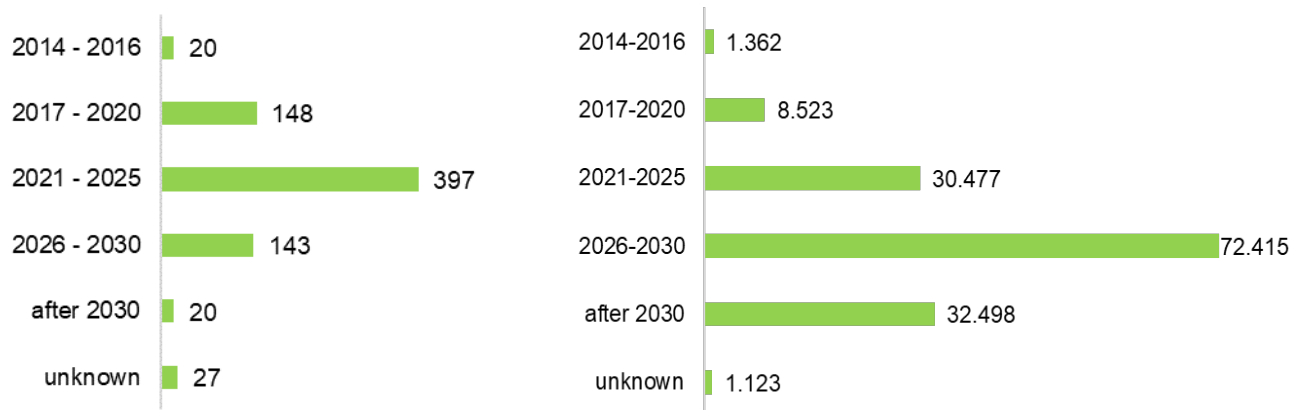
**Figure 15: Total number of projects per each MS**



**Figure 16: Total cost of projects (€ bn) per each MS**

Italy, France and Spain record higher costs (respectively, about 56, 34 and 31 billion €), while Slovenia, Hungary and Croatia follow with lower figures.

Out of 755 projects (+148 more than the 4<sup>th</sup> Work Plan – August 2020): 185 were already completed, 397 are to be completed by 2025 and 143 by 2030. Additionally, we estimate that 20 projects are programmed to be completed only after that target year and for 27 projects the completion end date is “not known”.



**Figure 17: Total number of projects by competition time cluster**

**Figure 18: Total cost of projects (€ billion) by competition time cluster**

The figure above highlights how a considerable part of costs has to be sustained for projects that will be completed after the 2030 target year (22%), while €1.1 billion are allocated to projects whose completion date is unknown (1%).

### Proposal for additional projects

An analysis of the sections currently not compliant with the TEN-T requirements but not covered by any infrastructure investment plan until 2030 was performed to identify the additional projects necessary to complete the Mediterranean Corridor.

The additional projects were identified based on country expert analyses on existing infrastructural gap on the corridor (not covered by projects already included in the Project List of Member States but considered, in our opinion, necessary to implement the Corridor).

The following figures summarize the additional projects proposed on the Corridor per each project category and Member States.



**Figure 19: Total number of additional projects per each MS**

**Figure 20: Total number of additional projects per each project category**

## Cost estimation

Total cost of projects included in the Project List is 146,4 Billion of Euro. It should be underlined that projects already completed since 2013 account for 10,5 bn €.

## Innovation and deployment of alternative fuels infrastructure

Implementation of projects in fields of deployment of alternative fuels' infrastructure, ITS and digitalisation within all transport modes, in urban nodes and, as appropriate in other areas that contribute to a sustainable, smart and efficient transport system, should be facilitated. 288 projects are connected to this typology of investment<sup>10</sup>. It amounts to about 32% (€ 45.6 billion) of the total investments allocated to the MED CNC, as summarized, per project category, by the following figures.

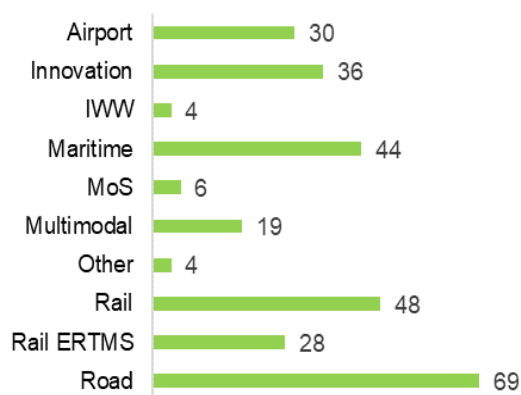


Figure 21: Total number of projects per each project category

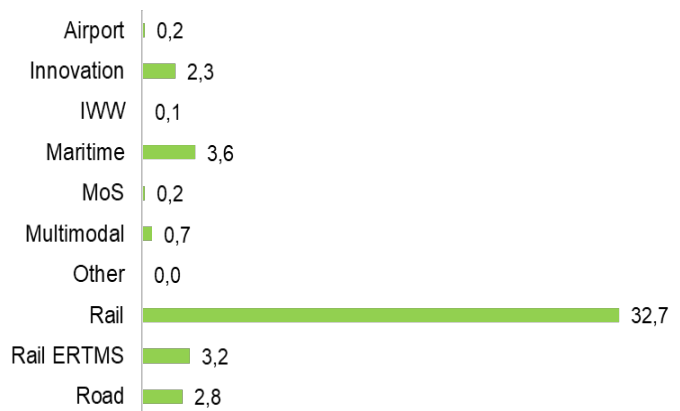


Figure 22: Total cost of projects (€ billion) per each project category

## 2.2 Rail & RRT

Out of 755 projects included in the MED project list, 192 relate to Rail + ERTMS mode for a total cost of € 93.2 billion. The analysis of the Project list shows that 94 projects concern the achievement of a specific rail KPI, which bodes well for the overall progress to be reached by 2030 on the whole rail network. Although the only KPI reaching full compliance is electrification, positive results can also be achieved in terms of:

- Axle load ( $\geq 22.5t$ ) (98% in 2030);
- Train length (740m) (72% in 2030);
- Track gauge (84% in 2030).

## 2.3 The ERTMS deployment 2023

### ERTMS Rail compliance

The total length of the MED corridor is 11.410 km, including the CEF 2 extension. According to the ERTMS European Deployment Plan (EDP) 3.080 km and 3.135 km are expected to be operational by 2021 and 2023. Overall, ETCS (European Train Control System) is in operation on 18% of MED, while GSM-R (Global System for Mobile

<sup>10</sup> Innovative projects are considered those involving some form of sustainable and future-oriented mobility, such as: (i) Clean fuels (IWW/Maritime, Road, Air) or (ii) Telematics application according Reg. 1315, Article 31 or (ii) Sustainable freight transport services according Reg. 1315, Article 32; excluding MoS.

Communications - Railway) on 49% of the corridor. In June 2022, 53% of the MED length planned in the EDP by 2023 was in operation with ETCS.

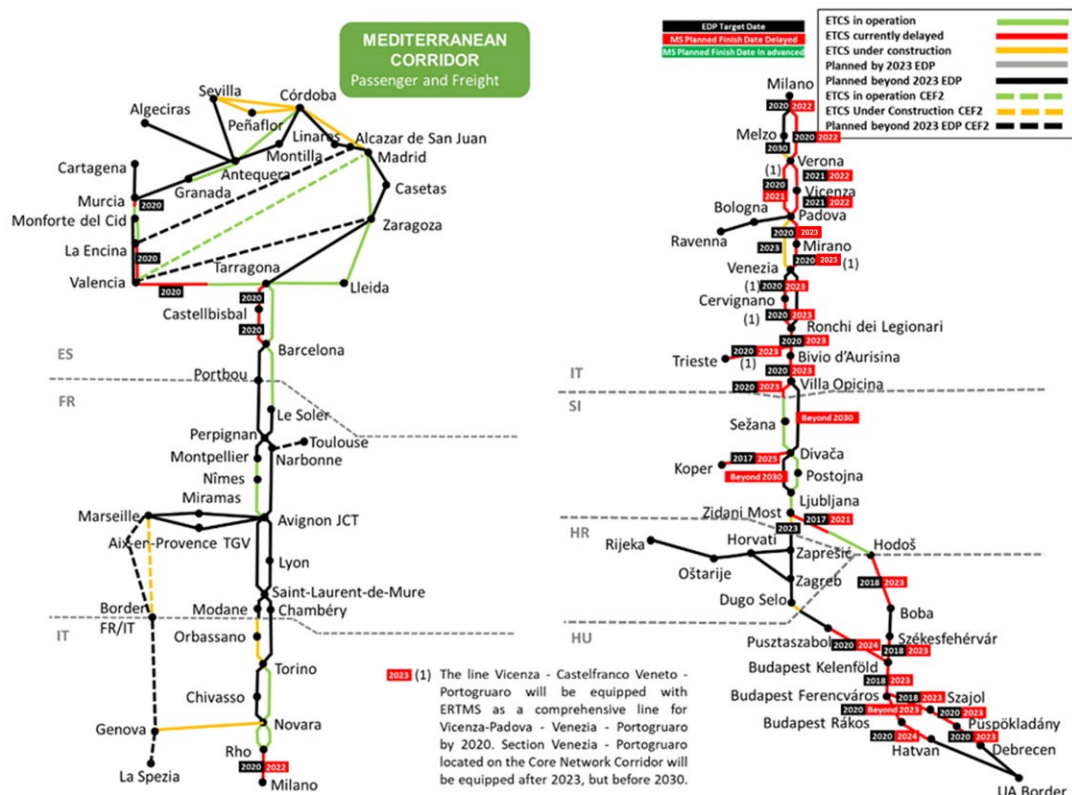
Given the current deployment figures and considering that some Member States have already notified delays in implementation, it will not be possible to meet the ERTMS EDP deadlines in this corridor by 2023.

The main bottlenecks threatening compliance with 2030 targets are the following:

- with the exception of the Marseille - France/Italy border line, French plans do not support that lines planned in the EDP beyond 2023 will be in operation by 2030;
- the commissioning of the planned high-speed line between Ljubljana, Divača and the Italian border is not included in the Slovenian deployment plan for 2030. However, the conventional line between those cities is already in operation, allowing for continuous ERTMS operations on the MED corridor;
- the Croatian deployment plan does not include a planned date for planned lines belonging to MED, i.e. the Oštarije - Rijeka line and a bypass line in Zagreb;
- the Hungarian deployment plan does not include a planned date for some MED sections, i.e. the Boba – Székesfehérvár section and the Hungarian sections next to the Croatian and Ukrainian borders.

### EDPD Compliance

The following scheme shows the state of play and deadlines for the ERTMS deployment in the MED corridor, considering the dates of the ERTMS EDP:



**Figure 23: State of play and deadlines for the ERTMS deployment in the MED corridor**

In Spain, most of the lines planned in the EDP by 2023 are already in operation, including one of the cross-border sections with France. According to the Spanish plans, all MED sections will be operational by 2030.

In France, there are already some lines in operation on MED. The Marseille - France/Italy border line is planned to be equipped with ERTMS by 2030, with a first section equipped by 2027. However, French plans do not support that sections planned in the EDP beyond 2023 will be in operation by 2030.

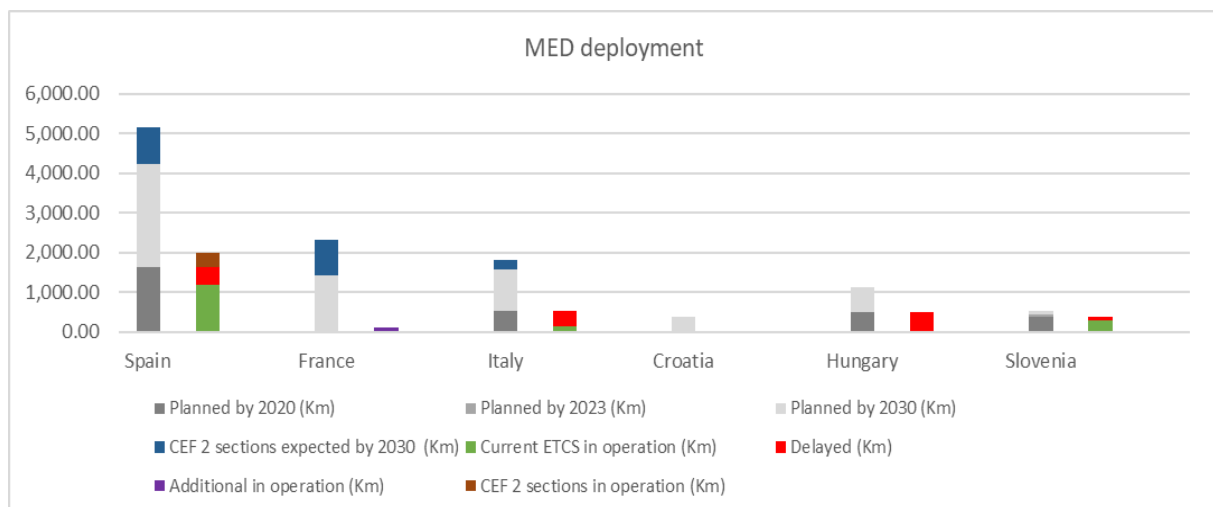
In Italy, there are already some lines in operation. Most sections planned in the EDP by 2020 are delayed until 2023. According to the Italian plans, other MED sections will be in operation by 2030.

Most of the lines planned in the EDP by 2023 are already in operation in Slovenia, including the Slovenian section next to the Italian border. According to the Slovenian plan, MED sections will be operational by 2030, except for the planned high-speed line between Ljubljana, Divača and the Italian border.

In Croatia, no lines will be equipped with ETCS by 2023, in line with the EDP deadlines. According to the Croatian plan, MED sections will be in operation by 2030 except for the planned line Oštarije – Rijeka and a bypass in Zagreb.

In Hungary, lines planned in ERTMS EDP by 2020 are delayed until 2021-2030. Sections planned in the EDP beyond 2023 are not included in the Hungarian deployment plan.

CNC corridors have been extended in 2021. The CEF 2 extension added to the MED corridor new sections in France, Italy and Spain that in the framework of CEF 1 did not belong to any CNC. Considering this extension, the total MED corridor length has been increased to 11 410 km.



**Figure 24: ERTMS deployment for each MS**

## 2.4 IWW & inland ports including RIS deployment plan

For inland waterways, 40 projects have been identified for a total amount of € 6 billion, contributing to the achievement of full compliance for all infrastructure requirements set by the regulation. They are distributed among the Member States as follows:

- 19 projects in Italy: major projects involve work on the implementation of class V standards (Ferrara – Porto Garibaldi, Po – Brandolo, Litoranea Veneta, Fissero-Tartaro- Canalbianco), measures to ensure safe navigation on the River Po and upgrading work at the port of Cremona and Mantova.
- 2 cross-border projects: aimed at operation of cross-border river information services based on exchange of RIS data.



## 2.5 Road transport (incl. ITS deployment)

152 road projects were included for a total cost of € 11.8 billion.

The road network is already very near to the compliance with respect to the parameter “motorway/express road” and the compliance of the whole road network is expected by 2030 with the completion of the section Vásárosnamény – Záhony (HU/UA order).

An improvement along the corridor is necessary in terms of secure parkings, availability of clean fuels as well as the deployment of intelligent transport system – important contributors to efficient, clean and economically viable transport. 42 projects in the list relate to the ITS development.

## 2.6 Maritime Ports

154 maritime projects were included for a total cost of € 15.4 billion.

The ports of the Mediterranean Core Network Corridor (CNC) handled 532 million tonnes of cargo in 2020<sup>11</sup> (around 16% of all cargo transiting through EU ports), **making it one of the most important CNC in terms of maritime traffic**. The CNC has a balanced mix of large ports (>50 million tonnes: Algeciras, Barcelona, Valencia, Marseille, Trieste and Genova), medium-sized ports (10-50 million tonnes: Cartagena, Tarragona, La Spezia, Ravenna, Venezia, Koper and Rijeka) and smaller ports (<10 million tonnes: Sevilla and Palma de Mallorca).

A modal shift from road to less carbon-intensive modes is one way to reduce the carbon emissions of the transport sector. The Mediterranean corridor is a typical coastal corridor, and there are various regular maritime ro-ro and container services in parallel, e.g. between Barcelona and Valencia, Genoa and Savona, as well as Barcelona and Koper. Therefore, maritime transport is an alternative on certain routes. The Mediterranean CNC also includes sections typically used for port hinterland transport, e.g. the connections between Madrid and Barcelona, Lyon and Marseille as well as between Koper and Budapest. Regular ro-ro and container services feed the corridor with maritime traffic. The respective sections of the Core Network Corridor must hence be developed in line with growing port hinterland traffic demand.

It is also important emphasising the need of facilitating the availability of clean fuels in ports, in order to be aligned with the requirements established by the Regulation. Out of 154 maritime projects, 12 are connected to the achievement of the “availability of clean fuel” KPI (€ 2.4 billion).

## 2.7 Airports

The connection of main airports with rail network is fundamental to achieve the intermodality objective set by the Regulation. Out of 85 airport projects (€ 3.4 billion), 8 are connected to the achievement of the “connection to rail” KPI (€ 1.2 billion).

Regarding the 6 main airports of the corridor, only Lyon is currently considered compliant to the characteristics of “Main airports”, according to Annex II of the Regulation (EU) N° 1315/2013. For other main airports, that according to article 41.3 shall be connected with railway transport infrastructure by 2050, the following information can be summarized:

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<sup>11</sup>Source: [https://ec.europa.eu/eurostat/databrowser/view/MAR\\_GO\\_AA\\_\\_custom\\_1974362/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/MAR_GO_AA__custom_1974362/default/table?lang=en)

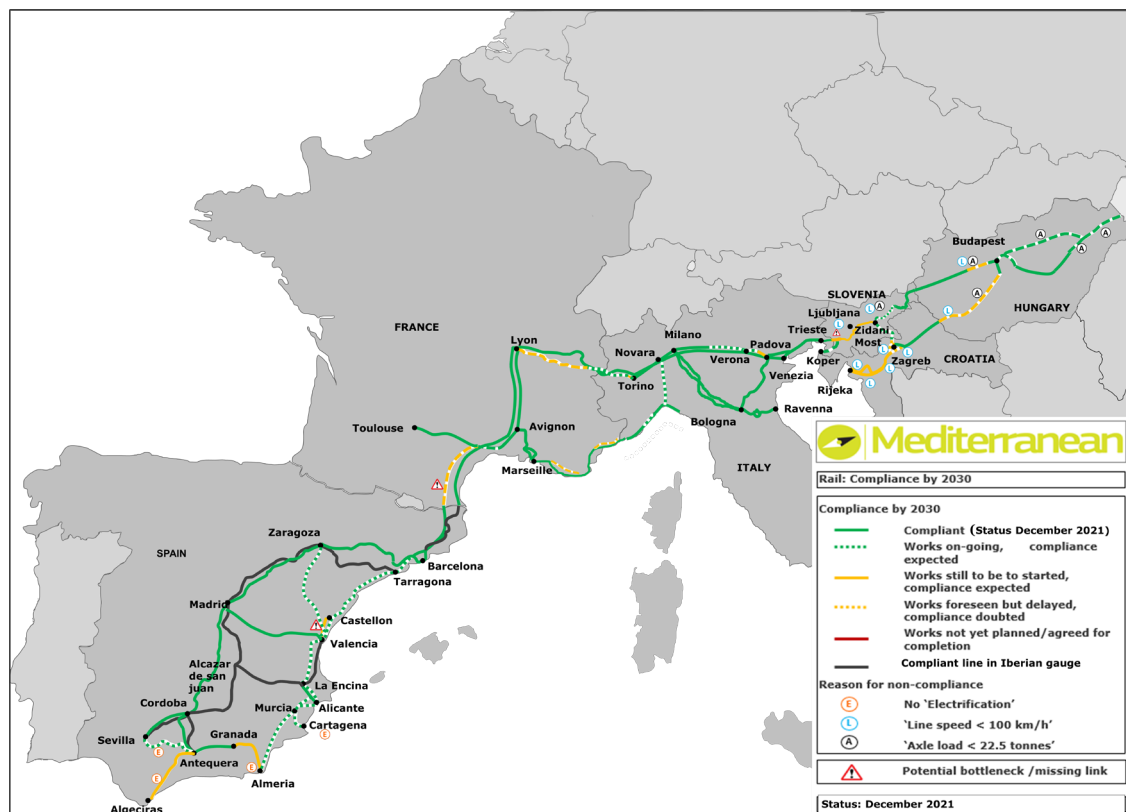
- Madrid Barajas airport: the airport is currently connected with conventional rail in its main terminals. The Infrastructure Manager launched in September 2021 the public information process for the HS rail connection to the airport, which is expected to be provided by 2030;
- Barcelona airport: the airport is connected with conventional line in one of its terminals (out of two). The conventional rail will be extended to the second terminal by 2030 but no project for connecting the airport to the high-speed rail network is foreseen so far;
- Milano Linate: the airport does not have a connection with conventional and/or heavy rail. A project is foreseen to connect the airport by underground to be linked to the conventional/heavy rail line;
- Milano Malpensa: the airport is connected by conventional rail from Milano via Ferrovie Nord line. A connection to heavy rail is planned to establish a connection between airport and the high-speed rail line Turin-Milan;
- Budapest airport: the Budapest Liszt Ferenc International Airport is not yet connected to the main Hungarian passenger railway network, however the freight train connection is already in operation. This bottleneck is expected to be eliminated with the construction of a rail link providing good connection between the airport, Budapest city centre and several other destinations. The project has design plans under evaluation, with complex ownership/legal and especially funding questions.

## 2.8 Overview bottlenecks and missing links

Following the analysis carried out so far, the following section will provide an overview of the main bottlenecks and missing links that could have a negative effect on transport activities in the MED corridor. Despite the large number of ongoing and planned infrastructure projects along the Mediterranean Corridor, bottlenecks and missing links can still be identified because either some projects are not planned by Member States or they are subject of significant delays. The analysis was conducted per mode of transport.

### Railway network bottlenecks

The figure below shows the level of expected compliance of the **rail** network along the Mediterranean Corridor in 2030 by considering the railway parameters "Electrification", "Line speed  $\geq 100$  km/h", "Axle load  $\geq 22.5$  tonnes" and "Track gauge = 1,435 mm".



**Figure 25: Rail compliance map by 2030 overview (data status December 2021)**

The key is to improve the **cross-border sections**:

- Italy - France:** the new railway link Lyon-Turin with a 57km base tunnel as the main part is the main project of the whole Mediterranean Corridor. It is highly strategic, because it is the main missing link in the Corridor which aims at connecting south-western Europe with central and eastern European countries. Failing this high performance connection transport relations especially between Italy and France, Italy and Spain, and Spain and central and Eastern Europe are hampered. As a consequence freight flows are mainly confined to road transport and deviated to other routes causing congestion and creating additional costs. On the Italian side, investment planning of the access lines is still in a design phase for the Avigliana-Orbassano section. Based on the current planning, the historical line section will be compliant to all the current TEN-T parameters except for the train length whose upgrading is not considered as a valid option, in the light of the construction of the parallel new stretch. In addition, infrastructure works on the historical line Bussoleno-Avigliana for the technological upgrading are ongoing and works to upgrade the loading gauge and to ensure a passenger line speed > 160 km/h are still to be planned. In France, phasing and precise consistency of the improvement of the access lines (new sections and upgrade of the existing) is still under discussion.
- France – Spain:** the UIC rail cross-border connection between Spain and France is achieved through the Le-Perthus tunnel. Both the extension of the UIC gauge to the south (Algeciras), currently ongoing in different sections, and the construction of the missing link between Montpellier and the end of the Le Perthus section are very important to realise the potential of the tunnel. Currently, the national investment scenario set out in the French Mobility Law

plans the beginning of the construction of a first section of the new line (Montpellier – Beziers) between 2028 and 2032, and the second phase (Beziers-Perpignan) after 2033. Discussions with Occitanie Region and other stakeholders are on-going with the aim of accelerating this planning.

- **Italy - Slovenia:** following the common decision to postpone the construction of a new railway line until after the 2030, the upgrade of the existing line (two tracks) between Trieste/Aurisina and Divača to meet TEN-T standards is currently ongoing. The project foresees:
  - the upgrading to the track length to 750 m;
  - removal of the crossing level along the line and centralized traffic control by the ACC-M of Monfalcone;
  - capacity increasing and improvement of the regularity of the cross-border service between Italy and Slovenia.

Speed increase on this section is very challenging due to geographic constraints (16 ‰ gradient for Italy to Slovenia) with a risk of non-compliance.

- **Slovenia - Croatia:** the whole stretch of this cross-border section between both capitals requires upgrading. The line suffers from speed limitations (on the Slovenian side, only one part of the section Ljubljana – Zidani Most). It needs the reconstruction of the Ljubljana – Zidani Most and Zidani Most – Dobava railway sections, with completion scheduled for 2030. On the Croatian side, the reconstruction of section Zagreb – Savski Marof (HR/SI Border) is underway. The condition of the line has deteriorated due to insufficient maintenance, leading to the reduction of the speed from 120 km/h to the current 60 km/h. The renovation will include replacement of the permanent track, renewal of the substructure and adaptation of the signalling and overhead line equipment to allow trains to operate at a speed of 120 km/h. The completion is scheduled for 2022.
- **Croatia – Hungary:** the cross-border section (Botovo- Gyékényes) is part of the main railway line connecting Zagreb and Budapest. As most of this important connection, the cross-border section requires up-grading to TEN-T standards. Croatian rail infrastructure manager HŽ Infrastruktura has signed a EUR 241 million grant agreement with EU's Agency CINEA for the upgrading of the existing track and the construction of a new second track of the 43.2 km long Križevci-Koprivnica-Hungarian state border railway section. The new line will follow the existing route, except in the section between Carevdar and Lepavina. Works will include reconstruction and construction of four rail stations and six stops, upgrade/removal of removal/upgrade level crossings, the removal of one existing bridge over the river Drava and the construction of a new one. These activities will increase the line capacity, enable speeds of up to 160 km/hour, shorten travel times, allow usage of interoperable trains, and increase the level of safety. The project started with a considerable delay and was unstable for years. The completion is expected by 2023, however due to the above it is very likely to be postponed.

In addition, as shown on the map, the following main issues arise per country:

**Spain:** The projects for the construction of the second platform between Castellón and Valencia and through tunnel across Valencia finished the public information process in

December 2021 and were presented to local Administrations. Currently this section is shared by freight services (it feeds ports of Castellón, Sagunto and Valencia), commuter and regional services and high-speed services Madrid-Valencia-Castellon and Valencia-Barcelona. The two future UIC tracks, will be dedicated to high-speed services, releasing additional capacity for freight traffic on the existing tracks.

The new through-passing tunnel in Valencia covers two fundamental needs of the Mediterranean Corridor, on the one hand, to allow the passage, without capacity restrictions, of all north-south passenger services along the Corridor and release the capacity of the current tunnel for freight traffic. It will also improve the connectivity between urban nodes of the core network and the regional networks.

The electrification and adaptation to UIC gauge of the railway line between Granada and Almería are expected to be completed by 2030. Regarding the Antequera-Algeciras line, the track renewal works are ongoing except for the electrification, which is still on hold due to the required update of the environmental impact assessment in a small stretch of the line. In March 2019, preparatory works started with the drafting of the engineering project for the construction of the two electric supply substations required for the electrification of the line. This is the reason why this line is marked in yellow (only electrification works are left to start but compliance is expected for 2030). In relation to the upgrade to UIC gauge, other construction works are also ongoing. The new infrastructure is almost finished for the connection of Murcia with the high speed network. A functional analysis is currently under elaboration to devise the planning of the rail services in the line Antequera-Granada-Almería, as well as additional adaptation works to be undertaken in the near future to improve the functionality of this connection. The outcomes of the study will be known in the beginning of 2022.

**France:** In France, the corridor sections are already compliant with TEN-T standards except the cross-border section with Italy and ERTMS. The former will be solved with the completion of the new base tunnel under the Mont-Cenis (international section of Lyon-Turin) expected in 2032. Delays can be noted with regard to a new high-speed line Montpellier – Perpignan or the access line to the Lyon-Turin base tunnel; however studies are on-going to define possible alignment, financing scheme and timetable and progress has been made in the last months, especially regarding the financing of the first phase of the Montpellier – Perpignan line. Moreover studies and procedures continue on the improvement of urban rail nodes in Marseille (as part of the Ligne nouvelle Provence Côte d’Azur project, whose enquiry of public interest was hold between January 17<sup>th</sup> and February 28<sup>th</sup> 2022 for phase 1 and 2 and Lyon agglomeration. Although some developments are foreseen in RRT (near Marseille and Avignon for example), the existence of RRT with 750m-long platforms is not ensured for every core node of the Corridor in France.

**Italy:** To ensure compliance with TEN-T requirements, work is ongoing on the cross-border sections with France (Lyon -Turin) and Slovenia (Trieste – Divača). Regarding the Mediterranean Corridor extension, the upgrade of the Genova-Ventimiglia - whose completion is planned by 2030 – includes the line and systems technological renewal, with interventions in the stations aimed at improving accessibility and regularity of the services. However, the compliance to 740m train length along the entire route appears to be highly challenging in the light of the existing orographic constraints that make works technically difficult, highly expensive and hardly cost effective. The high-speed railway link “Terzo Valico dei Giovi” will integrate existing lines and it will be compliant with all the TEN-T regulation standards before 2030. In addition, works have started on

the Brescia – Verona new high-speed line whose completion is planned by 2028 (financing is not entirely secured). The project also includes the upgrading to four tracks of the line section from Brescia (completion planned by 2028), currently in the authorization process phase and the Verona node upgrading (completion planned by 2027), whose final planning phase is ongoing. When taking into consideration the full line between Milan-Venice, for both sections Verona – Vicenza and Vicenza – Padua the completion is foreseen in 2028, however the beginning of the works in the section Vicenza - Padua is foreseen in 2023. The works on the conventional railway line Venezia – Trieste continue with the intention to upgrade the line to TEN-T requirements: the elaboration of the executive project for the technological upgrade as well as the final planning of infrastructural interventions are currently ongoing together with the technical and economical feasibility project for the section Variant Ronchi - Aurisina.

**Slovenia:** The initial works on the second track Divača-Koper are in progress with minimal to no delay. Public procurement for the executive design was concluded with the signature of the contract already on 17 June 2019. The First phase (prequalification phase) of the public procurement procedure for the main construction works has been concluded. The company in charge of the second track Divača-Koper, 2TDK, has signed a contract in May 2021 with the consortium, which will be in charge construction works on the section between Divača and Črni Kal. Prior to this, the company has selected also the contractor for the section Črni Kal-Koper, thus the contractors for both sections have been identified and confirmed. Works should be concluded between the end of 2023 or early 2024. Last part of the project (track and track devices, ICT and other equipment) should be installed by the beginning of 2026, which ends the construction phase of the project. During 2021 progress has been made on the construction of the tunnels along the second track, the access roads, construction of the viaduct Glinščica and the selection of the landfill for surplus materials. Works on the section Zidani Most - Celje have been concluded at the end of 2021. The last section, which was upgraded was the section between Zidani Most and Rimske Toplice. The final value of the investment of the upgrade between Zidani Most and Celje was € 50 million lower than what was planned in the investment plan. The project has been in the final phase with ongoing works for upgrading of signalling safety devices and adjustment of ETCS. It is also worth mentioning that the successful upgrade of the Pragersko railway station (planned to be completed by 2023) would enable improved railway conditions, hence, eliminating bottlenecks and improving KPIs (line speed, axle load and train length), while also ensuring better living conditions for local population by shortening waiting times at railway passages (underpass construction). Upon completion of the project, the track category will be increased from C3 (load 20t/axis) to D4 (load 22,5t/axis), rail-road crossings will be managed, access to platforms will be improved and two new platforms will be built.

**Croatia:** Works on the Hrvatski Leskovac-Karlovac section are expected to be completed by the end of 2024, however the evaluation procedure of the received bids from April 2021 is still ongoing (i.e. the Contract for the execution of works has not been signed yet). This work includes building 44 kilometres of electrified track, seven overpasses and underpasses, as well as all upgrading crossings, stations and stops and installation of a modern signalling and security system. Despite the delays, project Dugo Selo – Križevci (Railway Section Upgrade and Construction of Second Track) is in the implementation phase, and it's expected to be completed no later than the end of the 2023. For the Oštarije – Škrljevo project (Designs for the upgrade of the railway

section) preparation of study documentation (FS, CBA, EIA) is in progress, and completion is expected by 2022.

**Hungary:** Some sections are not compliant with TEN-T requirements yet. Corridor's lines are not equipped with ERTMS and a number of sections do not correspond to the 22.5 tons axle load and the 740 m train length requirements. Several on-going projects aim at improving this situation including "Upgrade of the Budapest, Rákos - Hatvan railway section", "Püspökladány - Debrecen: upgrading of the railway line and ETCS", "Bajánsenye - Boba: ETCS 2 deployment", and "Budapest Ferencváros - Székesfehérvár railway line: ETCS2".

### **Operational and administrative barriers**

A special attention should be paid to the **operational and administrative barriers** that can have a negative impact on the profitability of the investment and on the efficiency of the whole Corridor.

As highlighted above, the main criticalities are observed in the railway sector. In terms of railway infrastructure limitations, the following main points can be noted:

- the existing limitations to train length (average train length allowed is in the range of 400-700 m, except France), which is far from the TEN-T requirement of 740 m;
- the Spanish sections with non-electrified lines (Bobadilla-Algeciras and Zaragoza – Turuel – Sagunto), requiring, when appropriate, the exchange of the locomotive with significant cross-border interoperability problems. In particular, the disparity of the power supply (3 KV in mixed gauges and 25 KV in high-speed in Spain and 1.5 KV in France) requiring new tri-standard locomotives or the adaptation of the existing ones. Therefore, the short-term problem is the lack of adapted locomotives to the special features of rail link from Spain to Perpignan. This issue is being addressed with the acquisition of new locomotives by Spanish railway undertakings, but more efforts need to be made to smooth interoperability; electrification in Algeciras-Bobadilla and Sagunt-Zaragoza has begun, with the informative studies in the first case and with the projects in the second;
- the limited loading gauge, to PC45-50, from the Italian/French border up to Turin, while from Turin up to the Italian/Slovenian border the available loading gauge is up to PC80;
- the limitations with regards to speed standards in Slovenia – to be completed by 2030 – and Italy, specifically on the cross border section (Border IT/SI / Sezana - Villa Opicina);

In conclusion, in order to achieve an interoperable and competitive railway network, two conditions need to be fulfilled along the Corridors: sufficient infrastructure quality and harmonisation of national rules throughout Europe.

### **RRT bottlenecks**

The most important technical bottleneck regarding **rail road terminals** on the corridor is the length of the tracks, which often prevent train assembly from making 740m long trains. It affects productivity and competitiveness of combined transport. It is also worth mentioning the importance and necessity of improving of fostering adaptation to European standards for connections to maritime ports and terminals and factories that generate freight traffic by rail.

## IWW network bottlenecks

For the **inland waterways network**, the full compliance for all the infrastructure requirements set by the Regulation is expected by 2030. At present TEN-T requirements are not achieved on the Casale Monferrato-Pavia-Piacenza sections and a short IWW section to Sete.

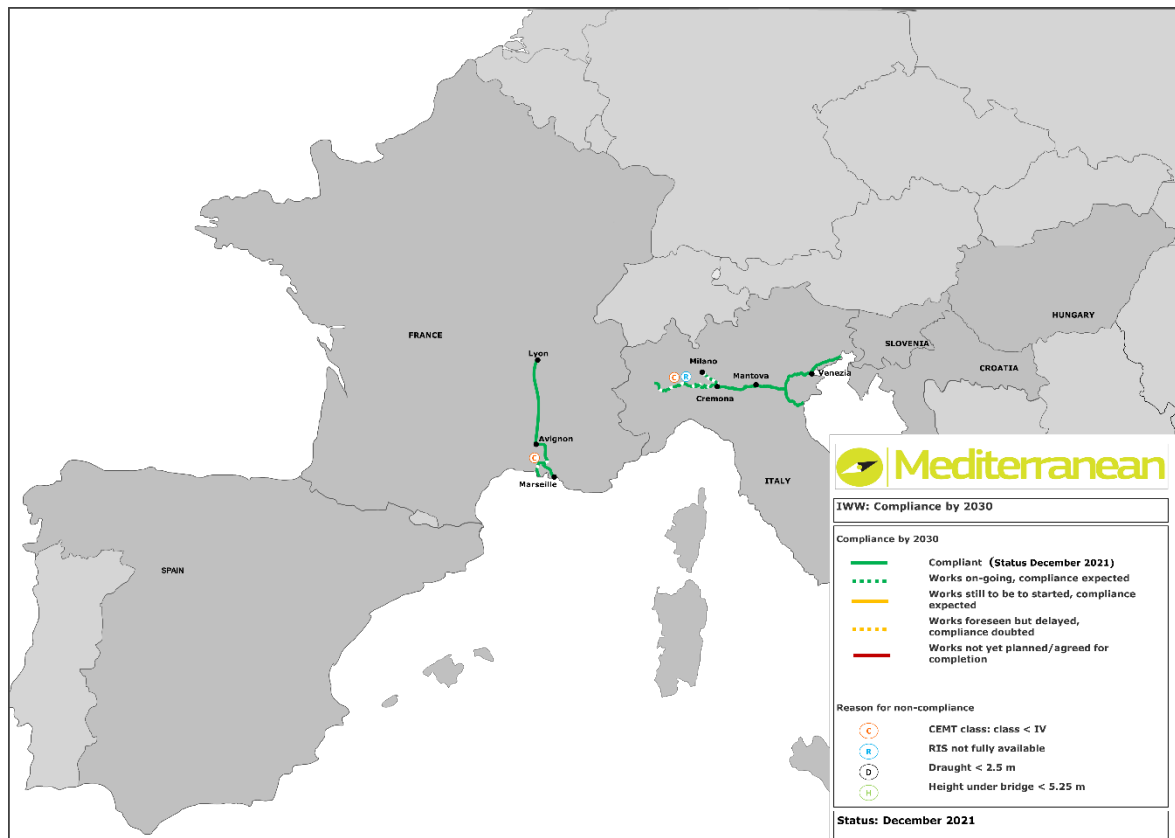


Figure 26: IWW compliance map by 2030 overview (data status December 2021)

## Road network bottlenecks

Full compliance for the **road network** is achieved along the Mediterranean corridor. The only currently non-compliant section concerns a few kilometres on the Hungarian-Ukrainian border (Vasarosnameny <--> Beregsurany). Several HU road projects aim at building the cross-border road section between Hungary and Ukraine, which is a major missing road link of the corridor on the external EU border. The planned and on-going developments are the following:

- **Hungary – Ukraine cross border section:** The works foreseen will extend the Hungarian M3 motorway up to the border. In terms of prioritisation, the realisation of this missing link is one of the important cross-border projects ensuring the smooth functioning of the corridor into neighbouring regions.
- **Hungary - Western section of the Budapest motorway ring:** the full closure of the motorway ring around the capital would widely contribute to decreasing road transit through the city and relieve the local road network of its western suburbs from the present heavy traffic pressure.



## Maritime bottlenecks

The following points should be highlighted:

- **the limited available draughts of Venice port** (due to the lagoon) pose limitations for certain types of traffic (requiring vessel of big dimensions). To this end, in addition to drainage works to counter sediment deposits, an inshore port system is being developed. The Onshore Terminal Project foresees the construction of a new container terminal in Porto Marghera (Montesyndial Area) for containers and energy products.
- **The freight traffic for Trieste port** is served by distinct rail transport facilities interconnected and connected to the external international network (in the port area there are about 70 km of tracks). However, the freight traffic flow is inadequate in relation to the available draught (deep enough to allow huge ships to dock) and is strongly increasing due to the construction of new terminals. Projects addressing this issue include upgrading the port's rail system to allow longer trains to run and building new rail links to the existing national rail system.
- **The upgrade of Rijeka port** in the general cargo terminal. The works are ongoing in accordance with the signed contracts.
- **The upgrade of land accessibility and connections with the hinterland of the port of Barcelona.** The main upgrading measures include the construction of several rail accesses (double electrified Iberian and standard gauge track, independent of the metric gauge track) including the new connection with the Can Tunis rail terminal, arrival and departure tracks at Nou Llobregat, arrival and departure tracks at Ronda del Port).
- There are **limitations on the connectivity** of the **port of Algeciras** to the railway line Algeciras-Bobadilla, but strong investment efforts are being made for the construction of sidings, electrification of the line and the upgrade of facilities.
- In addition, ports are now obliged to reduce their **environmental footprint** by delivering on the European Green Deal, as well as other environmental and climate policy goals. The provision of bunkering facilities for alternative fuels needs to be pushed further, although some ports have been working on this for years already. This is the case of Barcelona, Palma and Valencia ports in Spain, but also ongoing projects in other countries.

## Airports bottlenecks

The main issue likely to remain unresolved by 2030 is the availability of alternative fuels for aircrafts. In the meantime, some **airports** have started introducing alternative fuels into their ground services fleets. Among the projects addressing this issue there is the pilot implementation of a green hydrogen production plant at Bologna airport to develop a dual-function facility capable of serving the needs of the airport (airside operating vehicles and co-generator for Terminal needs) but also to provide a charging point for transport services around the airport for passengers (shuttles and buses) and for cargo (trucks and operating vehicles attracted to the cargo city).

## 3 The deployment plan of Motorways of the Sea, alternative fuels infra and nodes

### 3.1 Deployment plan of Motorways of the Sea

Maritime transport plays a key role for the European economy, transporting about 75% of its external trade and approximately 31% of its internal trade. Specifically, short sea shipping (SSS) makes up a majority (up to 60%) of the total maritime transport of goods to and from the main EU ports. With its large network of maritime ports on the trans-European transport network (TEN-T), the European maritime sector forms an important part of the intra-European transport system. The Motorways of the Sea (MoS) programme is a key instrument in this setting, working towards the ultimate vision of a European Maritime Space (EMS) that is **Sustainable, Seamless, Smart and Resilient**.

In the Detailed Implementation Plan (DIP) for MoS, the aim is to provide a sound analysis of priority investment needs to achieve the EMS, centred around four thematic pillars:

1. **sustainable**: emphasising on the reduction of GHG emissions and pollution of air, noise and water;
2. **seamless**: enhancing the connectivity with the rest of the TEN-T (the CNCs in particular), other transport modes, peripheral and outermost regions, islands and European neighbourhood countries;
3. **smart**: aligning maritime transport with the European digital agenda;
4. **resilient**: ensuring the EMS is capable of facing exogenous shocks.

Maritime ports and their hinterland connections play a key role to achieve these goals. The port infrastructure and the hinterland connections must facilitate the transfer of the European economies to non-fossil fuels, providing appropriate handling and alternative fuels terminals, storage and hinterland infrastructure. Given that the future demand of new fuels is not yet known, investment plans need to be flexible and react quickly with regard to a developing demand and supply.

Due to its relatively high energy efficiency, maritime transport can also play an important role in reducing the climate impact of transport. Especially on long coastal routes, maritime transport should be considered as a serious alternative to road transport. Such coastal services with a reduced carbon footprint should be developed in cooperation with shippers and forwarders.

Ports and port communities are also natural digital hubs, exchanging data with seaborne and land-based transport from all parties involved in the transport chain. Simplifying procedures, harmonised data flows and a common approach to deploy interoperable ICT systems will further facilitate the use of maritime transport.

Finally, the resilience of maritime transport chains requires the cooperation of ship operators, ports and forwarders. Exogenous shocks such as extreme weather events may lead to a temporary breakdown of ports or parts of the hinterland transport chain. To address such possible shocks, alternative shipping routes should be identified for relevant transport flows. Such alternative shipping routes may involve stakeholders along the TEN-T core network corridors with core and comprehensive network ports.

### 3.2 Plans for the deployment of alternative fuels infrastructure

The European climate law requires the Union to reduce its net greenhouse gas emission by at least 55% in 2030. Such emission reduction will require a significant contribution from transport. There is now considerable momentum as regards the market uptake of zero- and low-emission vehicles in the EU. However, in order to facilitate transition to a mass market and develop a truly common EU transport market full connectivity and a seamless user experience along the European transport network for low- and zero-emission vehicles, vessels and aircraft are needed. The TEN-T network has to provide the backbone of this endeavour.

The Commission report on the application of Directive 2014/94/EU of the European Parliament and of the Council on the deployment of alternative fuels infrastructure provides a comprehensive assessment of the state of play of alternative fuels infrastructure rollout in the EU<sup>12</sup>. It shows that market maturity varies considerably, depending on the mode of transport. Although some Member States have raised their ambition, the EU still lacks a comprehensive and complete network coverage of easy-to-use alternative fuels infrastructure, for all modes of transport. The European Court of Auditors has also stressed the significant differences between Member States in deploying charging infrastructure.<sup>13</sup>

The Commission is proposing a new Regulation on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU. Being part of the Fit for 55 Package of 14 July 2021, the proposal seeks to provide for a dense, widespread network of publicly accessible alternative fuels infrastructure in the EU.

The proposal for a new Regulation sets forth binding requirements for rollout of an infrastructure with a sufficient amount of minimum recharging and refuelling capacity to ensure full cross-border connectivity of light and heavy-duty vehicles throughout the EU. Distance-based targets for fast-recharging infrastructure along the TEN-T network complement national fleet-based targets for recharging of light-duty electric vehicles. A combined approach of distance-based targets along the TEN-T network with targets for overnight recharging infrastructure for trucks in safe and secure parking places and targets at urban nodes should further support the electrification of heavy-duty vehicles.

Distance-based targets for deployment of hydrogen refuelling stations, including for each urban node, will also ensure necessary minimum refuelling infrastructure for light- and heavy-duty fuel cell hydrogen vehicles.

Following the provisions of the proposal for a regulation on alternative fuels infrastructure, shore-side electricity supply should be provided in maritime and inland waterway ports. In addition, an appropriate number of refuelling points for LNG should be put in place at maritime ports and on road network of the TEN-T core and comprehensive network. Finally, stationary aircraft at airports and commercial transport operation should be able to make use of external electricity supply while parked at gates or at outfield positions at TEN-T airports.

The upcoming proposal for the revision of the TEN-T Guidelines will provide per transport mode cross-references to the Regulation on the deployment of alternative fuels infrastructure and additionally address aspects of private recharging and refuelling

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<sup>12</sup> COM(2021) 103 final

<sup>13</sup> Special Report 05/2021: Infrastructure for charging electric vehicles: more charging stations but uneven deployment makes travel across the EU complicated (europa.eu)

infrastructure in certain cases such as freight terminals. Private recharging infrastructure is also likely to be addressed in the upcoming proposal for the revision of the Energy Efficiency of Buildings Directive.

### **3.3 The development of Urban Nodes by 2030**

Urban nodes represent most of the points of origin and destination of transport flows on the Corridors. The effectiveness of the Corridors is therefore impacted by the effectiveness of the first and last miles of the journeys in those urban nodes and it is important to ensure sufficient multimodal connections. Urban nodes can also contain bottlenecks and missing links on the Corridors; conversely, they can be impacted by the negative aspects of traffic on the Corridors in terms of pollution, noise and safety.

13 Core Urban Nodes belong to the Mediterranean corridor. The main issues identified relate to road and rail congestion, as well as the need to intensify connections between ports and airports with inland areas.

Specifically, almost all urban nodes suffer from road traffic congestion. Major interventions underway or planned to tackle the problem include the construction of an outer ring road for the Seville node, parts of which are already in operation and the construction of the fourth ring road for the Barcelona node, which is scheduled to be completed by 2030.

For rail transport, it is quite apparent that the rail in urban areas faces serious bottlenecks, which hampers development and efficient co-existence of local, regional and intermodal traffic. Particular attention needs to be paid to urban nodes which form the crossing points with other core network Corridors, in order to allow a seamless flow of high-speed passengers and freight flows. This concerns first the major nodes like Valencia, Madrid, Barcelona, Lyon, Milan, Verona, Venice and Budapest. In the case of Barcelona, the construction of La Sagrega station, which already accommodates passing rail services, is making important progress. The urban integration in Murcia achieved by the burial of railway lines in urban areas, will also improve mobility around the city centre.

In addition, with regards to ports and airports, there is a strong need to intensify links with inland areas. Sevilla port accessibility, and its connection to the hinterland, is hampered by current infrastructures. The same applies to the port of Valencia and Lyon. In terms of last mile connection, airports in the main urban nodes need to be connected to the high-speed and local rail networks. Moreover, certain access lines are not electrified or do not fulfil the 22.5 t axle load requirement. Dedicated projects designed to improve the situation on the last-mile rail infrastructure are currently missing.

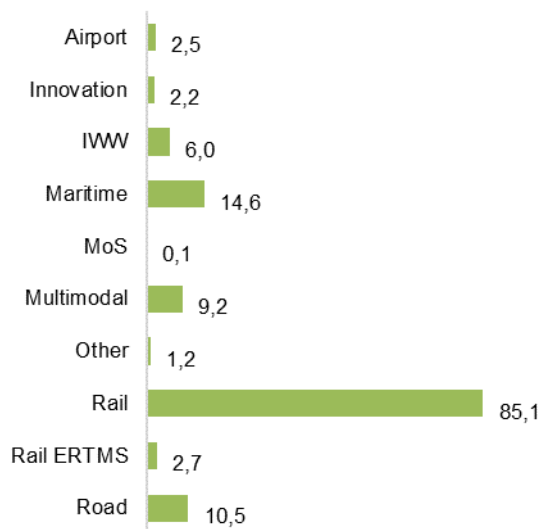
In terms of RRT, Lyon Venissieux RRT is characterized by an insufficient train length acceptancy and lack of capacity if we are aiming at a significant increase in rail traffic by 2030. Therefore, it represents a major bottleneck for the MED corridor. The same applies to the Miramas RRT (Marseille node). For both intermodal terminals, the French government has initiated or is planning projects to develop the entire node.

## 4 Funding and Financing

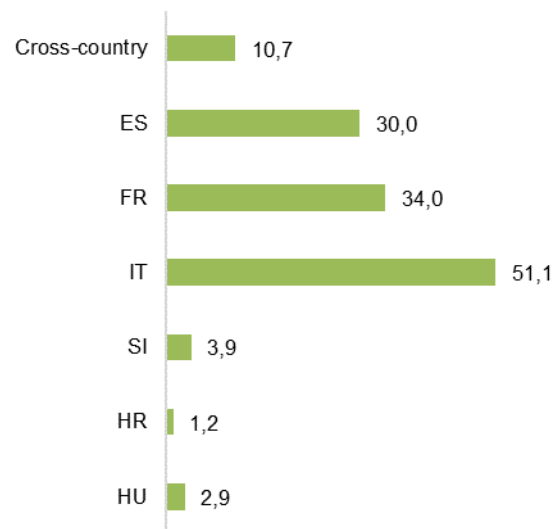
### 4.1 The funding needs

This section accounts for the economic and financial aspects of the projects included in the MED project list and, more specifically, information on the projects' cost, maturity and financial viability.

First of all, the MED Project List accounts for a total of 499<sup>14</sup> projects, for a cumulative value of 133.1 billions. Here below is the split in terms of necessary funding per mode of transport and Member States<sup>15</sup>.



**Figure 27: Split of necessary founding per mode of transport**



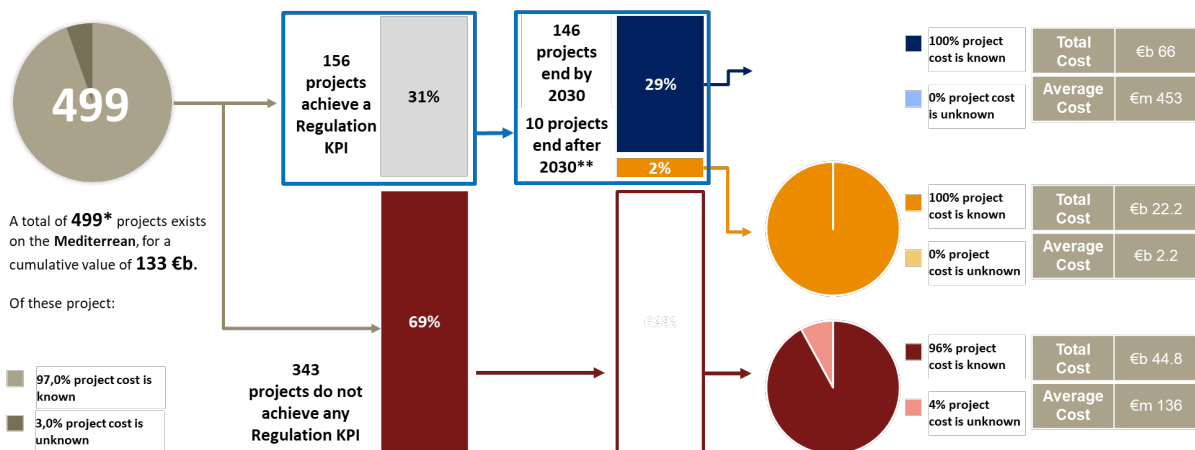
**Figure 28: Split of necessary founding per Member States**

After this initial assessment, the project list can be further analysed through a series of different lenses, in order to focus on different aspects of the projects composing it. The first step in performing the financial analysis has been an assessment of the maturity status of the project pipeline, summarised in Figure 29. This exercise included counting the number of active projects and clustering them through different metrics, such as their contribution to at least one Regulation's KPI, their timing and the availability of an official cost figure.

As depicted in the diagram below, the vast majority (97.0%) of the projects have information on cost, and this high share is reflected through the three subcategories.

<sup>14</sup> The analysis only considers projects ending after (31/12/2021)

<sup>15</sup> The presented figures represent an estimate based on the analysis of the 2021 Project List



\* The analysis does not consider projects ending before 31/12/2021  
 \*\* Includes projects for which the end date is "unknown"

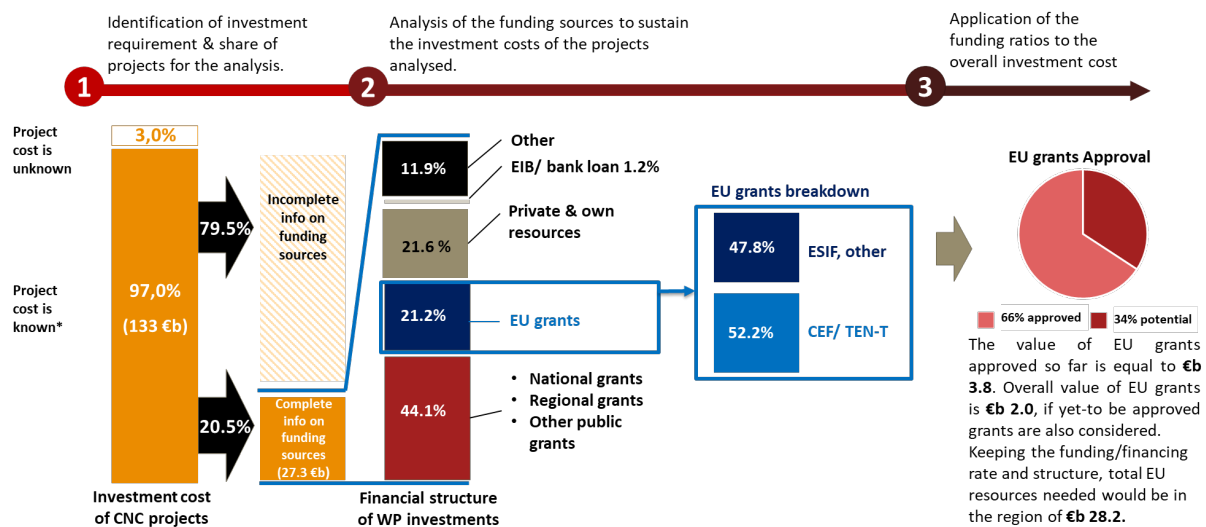
**Figure 29: Number of projects and values by category**

The next step in the analysis was to determine the funding sources of the projects, with particular reference to the economic effort of the European Union. Figure 30 shows clear and complete information on the funding sources of projects accounting for € 27.3 billion, or 20.5% of the list's value; of those, € 5.8 billion (21.6%) come from EU funding, with a majority share of it accounting for CEF/TEN-T grants (52.2%), and the rest belonging to ESIF and other EU grants (47.8%). It should also be noted that more than 65% (65.8%, or € 3.8 billion) of the EU funding has already been approved<sup>16</sup>. The remaining share is still listed as "potential", i.e. yet to be applied and confirmed by Grant or Loan agreements.

Next to the EU grants is the private financing, notably coming from the EIB: the amount of money the EIB lent to projects in the MED CNC might in fact not be fully represented by the 1.2%<sup>17</sup> (roughly € 328 milion) shown in the graph, due to following possible reasons, including incomplete reporting from the project promoters or unavailability of information prior to the financial closing. To this extent, it is important to note that the reported € 328 million refer to a total of eleven on-going projects related to upgrading works at the port of Ravenna, Koper and Trieste, as well as other works along the Venice-Trieste road and the La Encina-Alicante railway line.

<sup>16</sup> Only CEF/TEN-T grants marked as approved have been evaluated and confirmed by CINEA. Amounts listed as "potential" have no assurance of being secured, and in some cases, they only represent the intention of the project promoter to submit the request for funding.

<sup>17</sup> The EIB was not involved in the data collection phase, and has not yet disclosed official figures concerning its current and expected contribution to the MED CNC development.



**Figure 30: Funding and financing sources analysis**

The final step of the analysis is to determine the financial sustainability of MED transport infrastructure projects, i.e. the number and value of MED projects able to generate returns from the market to cover the operating costs and possibly a share of the capital expenditure. According to the findings, around 40% of the projects are potentially financially sustainable:

- 41.7% of the projects, for a total value of € 55.5 billion, are financially sustainable. Projects fall in this group following either a direct assessment from the project promoter or a subsequent analysis of the Consultant.
- 0.5% of the project list, for a total value of € 0.7 billion, presents good potential for financial sustainability. Projects included in this category, are considered appropriate based on Consultant's assessment.
- 57.8% of the project list, for a total value of € 77.0 billion, has low to non-existent potential for financial sustainability. This was based either on a direct assessment from the project owner or on a subsequent analysis of the consultants.

Financially sustainable projects are relevant because they can be developed with less - or no - impact on public finances, and/or supported with softer support measures (i.e. soft loans, blending instruments, de-risk instruments, etc.). The more infrastructure is developed through projects generating returns from the market, the less the amount of grants and national public finance is needed to complete the TEN-T network. Projects in the transport sector – and in some sub-sectors in particular, rail, inland waterway, etc. – usually face difficulties being (fully) financially sustainable.

## 4.2 Green Deal and RRF

The Recovery and Resilience Facility (RRF) Regulation has made 672.5 billion euro in loans and grants available to support both reforms and investments undertaken by Member States in the framework of national recovery and resilience plans. The aim is to mitigate the economic and social impact of the coronavirus pandemic and make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities of the green and digital transitions.

The Annual Growth Strategy for 2021 (AGS) and the Commission RRF guidelines have identified the development of sustainable, smart and safe transport as a priority for the European recovery and mentioned the deployment of alternative fuel infrastructure

among the 7 European flagship initiatives national recovery plans are invited to contribute to.

In this framework and considering the national plans already submitted, Member States dedicated significant parts of the RRF funding to transport, placing it among the top sectors of the economy to benefit from investments under NextGenerationEU.

While the RRF will finance a large variety of projects, priority will be given to those contributing to the decarbonisation of the transport system in the framework of the European Green Deal. Investments in the rail sector, in particular on the TEN-T network, will therefore have a prominent place. Other priorities will include sustainable urban mobility solutions (including collective transport and active mobility), inland navigation and the electrification of road fleets. In addition digitalisation of the European transport system will be accelerated by RRF support to investments in ERTMS, ITS or RIS.

### 4.3 The new CEF2

The CEF 2021-2027 Regulation entered into force on 14 July 2021, applying retroactively from 1 January 2021. The total budget for the CEF transport is EUR 25.80718 bn and its division between the envelopes as follows:

- General envelope: EUR 12.830 bn
- Cohesion envelope: EUR 11.286 bn
- Military mobility envelope: EUR 1.691 bn

The main priorities of the CEF are:

- Completion of the network: supporting the completion of the TEN-T, with particular priority to cross-border sections and missing links of the core network corridors (60% of general envelope and 85% of cohesion envelope).
- Modernisation of the existing infrastructure: tackle much more decisively the challenge of decarbonisation and digitalisation of the transport sector, to support the transition to smart, sustainable, inclusive, safe and secure mobility (40% of general envelope and 15% of the cohesion envelope).
- In line with the Action Plan on Military Mobility, for the first time, support the critical development of civilian-military dual-use transport infrastructure.

The CEF will contribute at least 60% of its funding to the **climate objectives** (compared to 30% of the overall target of the MFF).

The **blending** of CEF grants with other financial sources will be allowed. This might be implemented either through blending calls (CEF grants in combination with non-EU financial instruments, e.g. commercial banks or national promotion banks) or through blending operations (blend CEF grants with InvestEU).

The CEF will allow the implementation of **synergies** between CEF transport, energy and digital sectors. It will be applied either as “synergetic elements” (it will be possible for each sector to accept as eligible cost ancillary elements pertaining to another sector) or through joint work programmes jointly financed from each sector involved with the possibility to apply the highest co-funding rate of the sectors concerned and 10% top-up.

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<sup>18</sup> All amounts are in 2021 prices.



The Commission adopted the first multiannual work programme 2021-2027 on 5 August 2021. This specifies the funding objectives and budget for the years 2021-2023.

#### **4.4 Military Mobility**

As of 2021, military mobility will be taken into account in the Corridor work plans. The efforts addressing military mobility are based on 2018 EU Action Plan on Military Mobility which aims to improve military mobility in 3 key areas of action: transport infrastructure, regulatory and procedural issues, and other cross-cutting topics.

Concerning transport infrastructure, in 2019 the Council of the EU approved the Military Requirements for Military Mobility within and beyond the EU. These Military Requirements identify the geographical scope for military mobility as well as define transport infrastructure standards necessary for the military. The gap analysis performed in 2019 by the Commission services and the EEAS emphasises the synergies between TEN-T and military mobility: 93% of the military transport network is also part of TEN-T; and military transport infrastructure standards are mostly compatible with civilian transport infrastructure needs.

Owing to these synergies between civilian and military transport needs, actions aiming to complete TEN-T Corridors can also improve military mobility. The EU's new long-term budget now includes a dedicated 1.7 billion EUR military mobility envelope as part of the Connecting Europe Facility to co-fund such dual-use transport infrastructure projects.

## 5 The European Coordinator's recommendations and future outlook

The Mediterranean Corridor development and completion is essential for the deployment of the Trans-European Transport Network, aimed at creating a well interconnected, interoperable and efficiently managed transport system in Europe. It goes without saying that developing the Corridor as the backbone of international exchanges between Eastern and Western parts of Europe will contribute to the economic growth and competitiveness of the Member States. Furthermore it will facilitate the connection of the Corridor countries with third countries (in particular with countries in North and West Africa as well as in the East, including Eastern Partnership countries and the Western Balkans).

With less than 10 years remaining to 2030, the target year for Regulation, it is time to highlight all that has been achieved and, more importantly, define what remains to complete on the Mediterranean Corridor. This final chapter therefore presents my personal vision as the European Coordinator of the Mediterranean Corridor and recommendations on how to achieve the targets set by 2030.

The next Work Plan will be based on the new TEN-T Regulation, when adopted by the Council and the European Parliament. This is the last report under the expiring mandates of Coordinators and Corridor Consultants.

The Mediterranean Corridor faces a number of horizontal challenges, which will have to be tackled jointly between all Member States and regions situated on the Corridor.

- Strengthen the spirit of cross-border cooperation, including cross-border links with EU neighbours and accelerate on projects aimed in this direction.
- Make sure that the Corridor will benefit from the green transition of the transport sector and contribute to climate change objectives. The transition to a cleaner and more environmentally friendly transport system remains a challenge for all stakeholders in the transport sector. Further priority needs to be given to a modal shift from road to rail and the roll-out of clean fuel infrastructure.
- Re-evaluation of the wider geopolitical context of the Mediterranean Corridor following the Russian aggression in Ukraine. The conflict demonstrated the fragility of the transport and logistic system. It also proves the importance and necessity of transport Corridors. They are the backbone of integrated economy assuring an "invisible" link between Member States by means of integrated and interoperable transport infrastructure. The implications for the Mediterranean Corridor are unknown at this time. However, the conflict demonstrated a need for greater connectivity with Ukraine. Our Corridor ends in Ukraine and I am a strong advocate of the current status quo. We need this connection with a strengthened effort to build a robust cross-border crossing between Hungary and Ukraine, including well-integrated transshipment capabilities. In this context my call for maintaining the current alignment of the Mediterranean Corridor that from its eastern end is an entry point for cargo and passenger flows from Ukraine.
- Prepare the Corridor for a more synergic role in linking transport and logistic infrastructure and a wider energy and digital infrastructure. Digital solutions like ERTMS (rail), ITS (urban nodes), RIS (inland waterways), CITS (road sector), SESAR (aviation), VTMIS (maritime) will have a positive impact on efficiency of

transport flows. Urban nodes, multimodal hubs and rail-road terminals should be better integrated in corridor's structure. The challenge ahead us is how to make sure that Corridor will play a more active role by integrated planning of digital, energy and transport infrastructure. There is a big scope for a greater synergy between these three sub-components in terms of joint planning, for example. Transport infrastructure next to energy infrastructure (wind turbines, solar panels, recharging/refuelling infrastructure, ports as linchpins of transport and energy sector and a synergy created via digital solutions).

## 5.1 Progress achieved and pertaining critical issues

The analysis proposed above shows that ongoing and planned investments on the Mediterranean Core Network Corridor will improve the actual situation but overall the Corridor is still facing multiple challenges, mainly due to insufficient node capacity and infrastructural bottlenecks.

Progress is notable and is highlighted in major parts of this Work Plan, nevertheless, I would like to underline the serious risk in meeting the 2030 deadline.

- The accumulate delays of the works in some sections of the Corridor may deteriorate given the current war in Europe, which could spiral in further crisis of shortages in construction materials and generally high and still increasing prices.
- The non-alignment of some national investment planning with TEN-T deadlines, in particular, lack of tangible progress with the construction of national (yet with cross-border consequences) new high-speed line between Perpignan and Montpellier.
- Further efforts are needed to complete the Lyon-Turin international cross-border section on time and to plan and build modern and adequate access lines. It is of utmost importance that the capacity offered by the base tunnel will be matched by access lines able to accommodate adequate number of both passenger and freight trains.
- Significant progress has been made on the Spanish network to adjust the gauge to TEN-T requirements not only in railway lines but also in the port accesses. This work must continue so the interoperability between the Iberian Peninsula and the rest of Europe is achieved in line with a deadline of the TEN-T Regulation.
- The construction of the second track between Koper and Divača must continue at full speed and further improvement of the cross-border crossings between Slovenia, Italy, Croatia and Hungary is necessary.
- To further increase the attractiveness and competitiveness of rail for international freight services, a substantial improvement of the overall interoperability of the Corridor has to be ensured by removing the remaining restrictions in particular in terms of train length, axle load and signalling system needed to meet the market needs. While this effort can only be made gradually, this kind of issue is only solved when the whole Corridor has reached the common standards. Current diverging situation in Member States creates a serious obstacle to seamless international freight traffic flows.
- As regards roads, in addition to the necessary completion of the Hungarian-Ukrainian border section, there are many bottlenecks around central urban

areas, especially during peak hours. Intelligent transport systems have great potential for road infrastructure and therefore need to be further developed.

- Furthermore, the challenges that ports - as key infrastructure of the Corridor - will have to face by 2030 are not to be underestimated. Mediterranean ports further require the completion of hinterland connections, the digitalization of processes and the assurance in the supply of alternative fuels. In order to complete the hinterland connections and therefore achieving the highest returns from the measures implemented, it is necessary to complete the pending road and railway accesses. In particular, as regard rail, proper connections with hinterland are the most relevant critical issue. Rail connection should be addressed in terms of: (1) development inside the port in order to connect the different terminals with the port rail access; (2) connection between port and rail network (i.e. "last mile connection"); (3) long distance connections because of their bottlenecks and missing sections affect the development of services with origin and destination in the port.
- The development of heavy rail connection to the airports shall be set as primary objective for airport intermodality, both for passenger and freight. Specific projects presented in the Mediterranean Project list go in that direction (e.g. Madrid Barajas airport, Barcelona airport, Milano Malpensa and Budapest airport).
- It became quite apparent in the previous analysis that the main urban areas along the Corridor constitute sometimes serious bottlenecks for rail - hampering not only local and regional traffic but also restricting severely international traffic. Attention must be given to passenger and freight services using the same infrastructure.
- Special attention should also be paid to the operational and administrative barriers that can have a negative impact on the profitability of the investment and on the efficiency of the Corridor on the whole. In particular, focus should be on: harmonising national procedures regarding authorisation and certification of rolling stock, traffic management, management of terminals and access to the market and services.

## 5.2 Future challenges

In order to fill the identified infrastructure gaps, it is important to continue the multilateral, **cross-border cooperation between Member States** to avoid unbalanced developments on both sides of a border. For the main missing link, Lyon-Turin, this cooperation is fundamental. At the same time, despite the restrictions that are still in place, communication must be maintained between the Member States and DG MOVE in order to continue monitoring the development of the Corridor and to tackle together the challenges that still lie ahead. The organisation of Working Groups as well as Corridor Fora is essential.

This Fifth Work Plan has been prepared since November 2021 and was finalised in June 2022. In the meantime, the SARS-CoV-2 pandemic was underway with great impact on our lives, our health systems and our economies. The Russian aggression in Ukraine brought also unknown consequence to the future geopolitical set up of Europe.

The transport sector has been heavily impacted by the containment measures in Europe and worldwide. Continuity of service has been ensured by transport workers under

difficult conditions, showing their critical function in serving the population's basic needs. The transport sector will be crucial in **supporting the economic recovery**, as shown by the investments allocated to this sector in the different National Recovery Plans. They offer significant funding that can must be spent on transport in order to complete the key infrastructure for our corridor. Let us not waste this opportunity.

Finally, let's not forget the **European Green Deal**, which calls for a modal shift of goods to rail and inland waterways instead of road transport. Similarly, the **Smart and Sustainable Mobility Strategy** sets concise and ambitious targets to increase the market share of sustainable modes: rail transport must increase by 50% by 2030 and double by 2050, while inland waterways and short sea shipping (SSS) by 25% by 2030 and 50% by 2050.

The TEN-T project plays a key role in the Green Deal in supporting more sustainable modes of transport. **Accelerating the modal shift** requires a major boost in the use of rail and waterborne transport. The Mediterranean Corridor will have to commit itself to supporting the change to green by **investing in digitalisation as well as in the availability of alternative fuels**, while at the same time strengthening the capacity of the railway system and inland waterways.

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## Useful links

[https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t/mediterranean-corridor\\_en](https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t/mediterranean-corridor_en)



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