European Commission

Mediterranean

Work Plan of the European Coordinator

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Transport

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

1. Towards the Mediterranean Corridor work plan

On 1 January 2014 a new era has begun in European infrastructure policy with the setting up of nine core network corridors led by a European coordinator and the creation of the Connecting Europe Facility as financing instrument.

This new framework includes not only the Member States but also all other stakeholders of the Corridor: infrastructure managers (for road, rail, ports, inland waterways, airports and multi-modal terminals), regions and representatives of the transport industry as users of the infrastructure.

All these stakeholders come together in the Corridor Forum: four meetings of the Corridor Forum have been held in 2014 and have functioned as unique platform allowing a transparent and constantly deepening dialogue. Furthermore, the Corridor Forum served as the "testing ground" of many of the findings and recommendations presented in this document.

This work plan is largely based on the study of the Mediterranean corridor (the Corridor Study) carried out in 2014. It is presented as the result of the collaborative efforts of the Member States, the European Commission, external consultants and chaired by the European Coordinator.

The work plan has been elaborated in accordance with the provisions of Regulation (EU) No 1315/2013 which establishes Union guidelines for the development of the trans-European transport network (the Regulation)[1].

The concept of core network corridors rests on three pillars: modal integration, interoperability and the coordinated development of its infrastructure.

The Mediterranean Corridor is the main east-west axis in the TEN-T network south of the Alps. It runs between the south-western Mediterranean region of Spain and the Ukrainian border with Hungary, following the coastlines of Spain and France and crossing the Alps towards the east through Italy, Slovenia and Croatia and continuing through Hungary up to its eastern border with Ukraine.

This corridor of about 3,000 km, integrating former Priority Projects 3 and 6, ERTMS Corridor D and corresponding to the Mediterranean Rail Freight Corridor, will provide a multimodal link for the ports of the western Mediterranean with the centre of the EU. It will also create an east-west link through the southern part of the EU, contribute to a modal shift from road to rail in sensitive areas such as the Pyrenees and the Alps, and connect some of the major urban areas of the EU with high speed trains.

The regions along the Mediterranean Corridor represent an important socio-economic area within the EU. With 18% of EU's population the Corridor regions generated 17% of the EU's GDP. Economically speaking the most important regions of the Corridor are the Lombardy, the Rhone-Alpes region, Catalonia and Madrid.

The Mediterranean Corridor is intersecting with the Atlantic corridor in Spain (Algeciras-Madrid), with the North Sea-Mediterranean Corridor in France (Marseille-Lyon), with the Rhine-Alpine Corridor in Italy (Novara/Milano), with the Scandinavian-Mediterranean Corridor in Italy (Verona), with the Baltic-Adriatic Corridor in Italy and Slovenia, with the

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

Rhine-Danube Corridor in Croatia and Hungary and with the Orient-East Med Corridor in Hungary.

The main missing section is the new cross-border rail link between France and Italy (Lyon-Turin). The inclusion of Croatia and the cross-border links with Slovenia and Hungary need to be taken into account. Multimodal connections with the ports in Spain and France have to be developed and some railway sections in Italy and France need to be upgraded in order to remove key bottlenecks. The coexistence of two gauges (1668 mm in Spain and 1435mm in the other countries) is another challenge for this corridor, which needs to be tackled during in this new financial period.

2. Characteristics of the Mediterranean Corridor

Corridor alignment

The Mediterranean corridor links 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, up to the Ukrainian border with Hungary.

The main branches of the Mediterranean Corridor are identified in Annex I of Regulation (EU) 1316/2013 as follows:

- Algeciras – Bobadilla – Madrid – Zaragoza – Tarragona;
- Sevilla – Bobadilla – Murcia;
- Cartagena – Murcia – Valencia – Tarragona;
- Tarragona – Barcelona – Perpignan – Marseille/Lyon – Torino – Novara – Milano – Verona – Padova – Venezia – Ravenna/Trieste/Koper - Ljubljana – Budapest;
- Ljubljana/Rijeka – Zagreb – Budapest – UA border.

Besides these rail, road and inland waterway (IWW) axes the Mediterranean Corridor comprises in total **70 core nodes** distributed across the six Member States as shown in the table below:

Member State	Urban	Airports	Ports	Rail Road Terminals	IWW nodes	Total nodes per MS*
ES	4	6	6	7	1	24
FR	2	2	1	3	2	10
IT	4	6	3	6	5	24
SI	1	1	1	1		4
HR	1	1	1	1		4
HU	1	1		1	1	4
Total	**13**	**17**	**12**	**19**	**9**	**70**

This table is based on the list of nodes as set out in Annex II of Regulation (EU) 1316/2014. A detailed description of the alignment of the various sections of the Mediterranean Corridor by transport mode is given in chapter 4.2.1.2 of the Corridor Study.

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

In the new TEN-T Regulation the transport infrastructure requirements have been defined for the core network which will have to be met by 2030 at the latest.

The Corridor Study (cf. chapter 4.2.1.4) contains an in-depth analysis as to how the current infrastructure in the six corridor countries complies with the TEN-T Regulation's technical parameters set for each transport mode or infrastructure category. A summary of this compliance check is given below.

Rail

- **Electrification** is ensured on 90% of the Corridor's railway lines and only lacking on some sections in Spain and Slovenia[2]. On the rest of the corridor three different voltages are in use, which raises the issue of interoperability: 1.5kV DC (convential lines in France), 3kV DC (conventional lines in Spain, Italy and Slovenia), 25 kV AC (high-speed lines in France and Spain; convential lines in Croatia and Hungary).

Spain and Slovenia are working on the electrification of these sections: Alicante-Murcia-Cartagena and Almería (Huéneja Dolar)-Granada, Bobadilla-Algeciras for Spain and Pragersko–Hodos for Slovenia.

- One of the main challenges of the corridor is the different **track gauges**. France, Italy, Slovenia, Croatia and Hungary feature the 1435 mm standard UIC gauge, whereas Spain applies the Iberian gauge 1668 mm (except on the high-speed lines). During the oncoming years, Spain will expand the UIC gauge along the rail freight corridor as well.

In Spain, several projects listed in the Spanish implementation Plan aim at solving this issue on most of the conventional lines of the Corridor, mainly by replacing the Iberian gauge by UIC gauge (e.g. Valencia-Castellbisbal), partly by upgrading to mixed gauge with a third rail track (e.g. between Reus and Vilaseca).

- **ERTMS**-ETCS is deployed only on high-speed lines in Spain and Italy, as well as on some short cross-border sections between Italy/Slovenia and Slovenia/Hungary[3].

- A **train length** of 740 m is only allowed in France and on half of the Hungarian network as well as and on small part of the network in Spain and Slovenia. On the rest of the corridor train length restrictions apply, allowing a train length varying between 400m and 700m.

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

In France, on some sections the axle load is restricted to 17 t, but these sections are used for passenger services only. In Hungary and Slovenia, several interventions on rail sections are planned which aim at resolving these physical bottlenecks.

- The required minimum **line speed** of 100 km/h is achieved in Spain, France, Italy and in most parts of the Hungarian network; and on two thirds of the sections in Slovenia and on one third of the Croatian network.

[2] In Slovenia some projects are close to completion, i.e. the Pragersko-Hoso electrification will be completed in 2015.

[3] ETCS level 1 is currently under implementation on the Slovenian sections of the Mediterranean corridor

Rail technical parameters		Spain	France	Italy	Slovenia	Croatia	Hungary	Total
Parameter	Requirement							
Length of all sections	km	4.045	1.418	1.026	631	361	1.130	**8.611**
Electrification	*Core network to be electrified by 2030 (including sidings where necessary)*	84%	100%	100%	76%	100%	100%	**90%**
Track gauge	*New lines to be built in UIC standard gauge (1435mm), except in certain circumstances*	38%	100%	100%	100%	100%	100%	**70%**
Traffic management system	*(target: ERTMS level 1)*	25%	2%	13%	0%	0%	0%	**13%**
Train length	*(target: 740 m.)*	9%	86%	0%	10%	0%	58%	**24%**
Axle load	*(target: 22.5 t)*	100%	68%	100%	70%	100%	27%	**84%**
Speed limits	*(target: 100 km/h for freight)*	100%	98%	99%	68%	35%	90%	**93%**

The table below gives an overview of the compliance rate as regards rail.

Source TENtec

Road

The total length of the road network included in the Mediterranean corridor is about 5500 km, with Spain covering more than 50% of the entire corridor.

As regards the parameter "Motorway or Express roads", all countries are compliant. More specifically, only a few sections are not motorways: the western part of Spain (ex. Motril – Playa Cambriles, Motril-Nerja) and the Hungarian section close to the Ukrainian border. The Italian border sections with Slovenia and France are express roads.

The table below shows the compliance rate of the Mediterranean Corridor's roads.

Road technical parameters		Spain	France	Italy	Slovenia	Croatia	Hungary	Total
Parameter	Requirement							
km		2,855	503	823	433	293	596	**5.503**
Sections		49	18	33	15	9	19	
Motorway or Express roads	Roads have to be either an express road or a motorway by 2030	93%	100%	97%	100%	100%	96%	**95%**
Part of a tolled road	Use of tolling systems/ITS and their interoperability with other systems	30%	95% (474 km toll roads)	98%	100%	100%	85%	**61%**

Source: TENtec

Besides the requirements described in the previous paragraph, Regulation (EU) 1315/2013 also requires Member States to develop rest areas on motorways approximately every 100 km and improve the availability of clean fuels along the roads of the Core Network.

In this respect, the tables below show the number of refuelling points offering LPG and CNG and the number of parking areas; together with the density per country and Corridor.

Country	Length (km)	N. of clean fuels LPG	Density* 100km	N. of clean fuels CNG	Density* 100km
ES	2855	43	2	10	0
FR	503	47	9	1	0
IT	823	86	10	31	4
SI	433	29	7	3	0
HR	293	26	9	0	0
HU	596	28	5	0	0
Corridor	5503	259	5	45	1

Parameters	ES	FR	IT	SI	HR	HU	Corridor
Km of road	2.855	503	823	433	293	596	5.503
Number of parking	25	19	15	24	1	3	87
Number of parking per 100 km	0,88	3,78	1,82	5,54	0,34	0,50	1,58
compliance with TEN-t requirement	88%	100%	100%	100%	34%	50%	79%
Target (n. of parking to be compliant)	29	5	8	4	3	6	55

Ports

Ports represent the main gateways for passengers and especially freight transport to core network corridors.

There are 13 core ports in the Mediterranean corridor, mainly located in the western part: Bahía de Algeciras, Sevilla, Cartagena, Valencia, Tarragona, Barcelona, Marseille, Fos-sur-Mer, Ravenna, Venezia, Trieste, Koper and Rijeka. For ports, Regulation (EU) 1315/2013 requires the connection to the rail network by 2030.

All ports are reported to be fully compliant. Nevertheless, it shall be highlighted that several ports are further improving the rail connection with a view to improving the rail hinterland connection and thereby increasing possibilities for modal shift.

Inland Waterways (IWW)

The Inland Waterway 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 Mantova to Ferrara / Porto Garibaldi and Venice / Porto Nogaro / Monfalcone.

Regulation (UE) 1315/2013 sets the minimum requirement for the inland waterways of international importance to CEMT IV class, which means the fulfilment of the following parameters:

Class IV CEMT	Maximum length	Maximum beam	Draught	Tonnage
Motor vessels and Barges	80-85	9.5	2.5	1000-1500
Pushed convoys	85	9.5	2.5-2.8	1250-1450

80% of the IWW network of the Corridor meet this requirement. The 20% not complying correspond to the sections Pavia-Casale Monferrato and Piacenza –Pavia covering about 150 km, where the minimum width is about 8m instead of 9.5m.

Airports

The Mediterranean Corridor comprises 17 core airports: 6 are located in Spain (Valencia, Alicante, Sevilla, Malaga, Barcelona, Madrid – Barajas); two airports are in France (Lyon Saint-Exupery and Marseille-Provence); 6 in Italy (Bergamo-Orio al Serio, Milano – Malpensa, Milano – Linate, Venezia – Tessera, Torino – Caselle, Bologna - Borgo Panigale); and one each in the capitals of Slovenia, Croatia and Hungary.

Out of these 17 airports six are considered main airports in the meaning of Regulation 1315/2013, and thus subject to the provisions of Art 41(3), which requires the a connection to the trans-European transport network by 2050: Madrid, Barcelona, Lyon, Malpensa, Linate and Budapest. Only airports having direct rail services linking the airport with high-speed lines or long distance TEN-T railway lines are to be considered as "connected with rail". Local or regional/suburban rail connections, do not qualify. Thus, only Lyon airport can be considered directly connected to rail.

Nevertheless, several projects are in the pipeline to complete the rail connection of other corridor airports: the Alicante, Sevilla and Valencia airports will be linked by heavy rail. In Italy, Venice airport will be connected to the conventional and HS rail lines. The Bologna and Milan Linate airports will be connected to the national rail line network by a people mover and Underground line 4, respectively. For the Eastern part of the corridor, at the moment, no projects are foreseen to foster these kinds of connections.

3. Results of the transport market study

The Corridor Study, which has been published end of 2014[4], contains a detailed transport market study (TMS) (cf. chapter 4.2.2) which analyses the transport flows along the

[4] http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/corridor-studies_en.htm

corridor by assessing the capacity and traffic flows on the respective parts of the infrastructure.

The results of the TMS presented in this chapter have been inserted in the Work Plan in order to illustrate the traffic flows, demands and future prospects. These results will be used and further deepened in the works to be undertaken in 2015-2016, when analysing the list of projects and elaborating the next generation of the Work Plan.

(NB: Unless otherwise stated the figures given in the following chapters refer to the year 2010, which is the last year where a global set of data for the whole corridor were available.)

Current flows in the corridor's market area

In the Corridor Study transport flows of goods and passengers were looked at from two different angles:

1. First, the flows of goods and the movement of passengers between the corridor countries were described. This gives a good picture of the utilisation of the infrastructure along the corridor for the transport modes road, rail and sea.

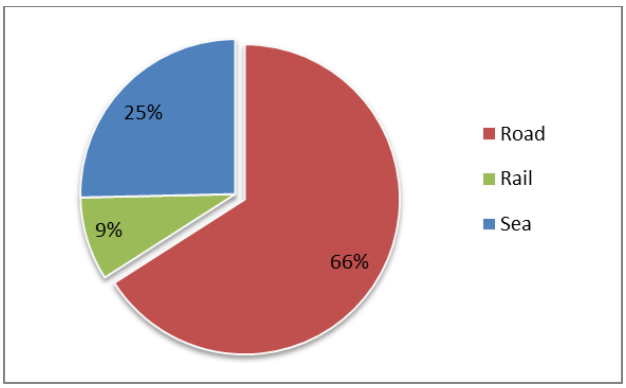
2. Then the flows of goods and passengers to and from the corridor countries to the rest of Europe have been analysed based on origin-destination pairs that cross at least one common border of two corridor countries. Thus the "market area" of the corridor was captured allowing also a forecast for the year 2030, target date for the completion of the core network corridors. (NB: due to the difficulty in obtaining origin-destination data for maritime transport, this mode is dealt with separately from the modes road and rail.)

Goods

1. The six corridor countries exchanged nearly 160 million tons of goods in 2010. The main flows are between Spain and France (45 million tons), and between France and Italy (36 million tons). These two flows represent 60% of the goods exchanged between the six corridor countries (in terms of weight).

As shown in the table below the overall modal split for international freight flows between these countries is 66% for road, 9% for rail and 25% for maritime transport. More than two thirds of the goods exchanged between Spain and Italy are transported by sea.

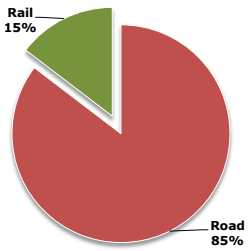
Mode	1000 tons / year (2010)	%
Road	105.154	66%
Rail	13.866	9%
Sea	40.405	25%
Total	**159.425**	



Total freight demand between corridor countries in 2010

2. In the "market area" of the corridor the freight flows (excluding maritime transport) for 2010 are shown below:

Mode	1000 tons / year (2010)	%
Road	129.623	85%
Rail	22.206	15%
Total	**151.829**	



Freight flows in the corridor's market area in 2010 (1000 tons / year)

Two observations can be made at this point:

1. The freight flows in the "market area" of 150 million tons are of the same order as the freight flows within the corridor.

2. The rail share is slightly higher in the market area as compared to the freight flows between the corridor countries, but remains at a relatively low level when compared to other international flows in Europe.

An analysis of the trade flows shows that

- Corridor countries have strong cross-border exchange flows at regional level with each other and with the rest of Europe; in particular Catalonia and Lombardy appear as the predominant generators of trade flows;

- Road is the dominant mode for flows between corridor regions, while rail takes a higher share in cross-Alpine freight (in a north – south direction) and in the eastern part of the corridor.

Another source of major international flows on the Corridor are the freight flows generated by the **seaports**. The total volume of commodities passing through the sea ports of the Corridor amounted to nearly 400 million tons in 2010, of which about 100 million tons concerned goods shipped between EU countries. 327 million tons (80%) of goods generate flows to and from the hinterland, the rest being transhipped.

The map below shows the total volume of goods treated in each port and the rate of EU-internal flows.

Volume of total goods handled by ports and rate of EU-internal flows (1000 tons / year)

As regards **inland waterways**, in 2010, freight traffic on the two waterways of the Corridor amounted to:

- 5,8 million tons on the Rhône;
- 1,6 million tons in northern Italy, from which 0,4 million on the Po river and 1,2 million between Venice and Porto Nogaro.

The main inland port of the corridor is Fos-sur-Mer on the Rhône followed by the Port Edouard Herriot of Lyon, which accounted for 1,3 million tons in 2010.

In Italy Mantova had 0,2 million tons, Cremona 0,08 million tons and Rovigo 0,09 million tons of IWW traffic in 2010. Porto Nogaro had 1,2 million tons. It is to note that IWW traffic in Italy has known a severe decrease between 2008 and 2010. In 2007 the port of Cremona had an IWW traffic of nearly 0,5 million.

Passengers

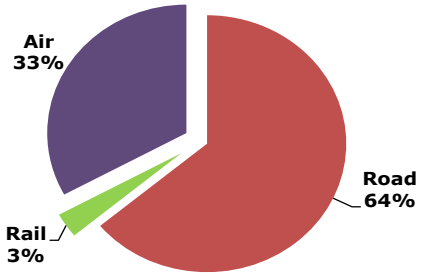
1. The total international passenger traffic between the six corridor countries is 81 million passengers per year. The two main flows are between France and Spain, and France and Italy: these two relations represent 80% of the international traffic considered. The overall modal split is 64% for road, 33% for air and 3% for rail transport.

The Spain – France and Italy – France relations are characterized by strong road traffic, consisting mainly of short-distance trips around the respective border points of Le Perthus (ES-FR) and Ventimiglia (IT-FR). Regarding air traffic, the first country per

country relation is between Italy and Spain, with almost 10 million passengers per year. France – Italy and France – Spain have both similar air traffic volumes (7,5 million).

The rail market share is generally weak, in particular for flows with Spain; flows between Hungary and Slovenia / Croatia have significantly higher rail market shares (15-20%) than the other flows, but on relatively small volumes of demand.

Mode	1000 pax / year (2010)	%
Road	51.687	64%
Rail	2.514	3%
Air	26.627	33%
Total	**80.828**	



Total passenger demand between corridor countries

2. Passenger flows in the "market area" of the corridor (i.e. based on origin-destination pairs that cross at least one common border of two corridor countries) can be summarised as follows:

Total market area (1000 pax / year)	2010
Road	46.261
Rail	3.001
Air	79.659
Total	**128.921**
Rail share	***2,3%***

These international passenger flows in the corridor's market of about 129 million passengers per year in 2010 are concentrated mainly in the western part of the corridor. The low rail share can be explained by the fact that a large part of these passenger movements are short-distance cross-border trips, which are still carried out more efficiently by road than by rail.

The other important flows are the flows between major cities and to touristic zones of the corridor countries or neighbouring countries ; the distance between these major nodes is generally really high (over 1000 km in most of the cases), which gives the air transport a tremendous market advantage for these type of flows.

Forecast of the overall transport demand

Freight

According to the Corridor Study the total demand in the market area of the corridor would increase from 151 million tons in 2010 to 267 million tons in 2030, with an average annual growth rate of 2,9%.

With the full implementation of the corridor, the rail market share could potentially increase up to 27%, reaching about 72 million tons a year.

The table below summarizes the forecasting results for the corridor's market area:

Total Market area	2010	2030 Trend (do-nothing)	2030 Corridor implemented	2030 Corridor Implemented (including accompanied rolling motorway)
Road	129 623	228 647	195 131	186 431
Rail	22 206	38 958	72 474	81 174
Total (except sea)	151 829	267 605	267 605	267 605
Rail share	*14,6%*	*14,6%*	*27,1%*	*29,4%*

The forecasts in the Corridor Study show that there is a **strong potential** for international **rail traffic** development on the Mediterranean corridor.

- The global demand can be expected to have a solid dynamic if GDP growth in Europe turns back to "normal" rates (as is expected in EC projections) on a long term average. It is particularly the case for the exchanges of goods with countries of Eastern Europe.

- Starting from a relatively low base in 2010, the final rail shares given by the forecasting model (between 20% and 30% for most of the relations considered) are not excessively high for international continental rail transport as long as it offers competitive performances; they remain below observed rail shares in Europe on the north – south direction.

- Thus, implementing the corridor could potentially shift about 33 million tons per year from road to rail (about 2,3 million trucks/year equivalent) or even 41 million tons / year (3 million trucks) if we include accompanied combined transport (rolling motorway).

- However, these forecasts express the *potential* market of the corridor, meaning that reaching these effects imply the complete implementation of the corridor with fulfilment of the TEN-T standards and the absence of bottlenecks, and imply also the creation of appropriate transport services along the infrastructure, particularly in combined transport.

As regards **maritime traffic**, all ports and all commodity types are expected to grow in the period 2010-2030, in particular container traffic (about 4%) without assuming shifts between ports and without specific growth of the transhipment traffic.

It is reasonable to expect that the level of rail traffic generated by the Corridor's ports could double by 2030 as compared to 2010 levels, even taking into account an increase of train length. The most important effects can be expected at the ports of Algeciras,

Valencia, Barcelona and Marseille, resulting in traffic growth and important modal shift expectations, combined with the expected improvements of the ports' rail connections.

Taking into account additional growth from shifting traffic from the Northern European port, this rail traffic increase could be even more important.

The maritime dimension of the corridor is also expressed by a strong traffic of short sea shipping and RoRo services between the corridor's countries or between Europe and northern Africa. This traffic is also expected to grow rapidly in the coming years with the further development of the motorways of the sea and with the economic and demographic growth of Africa.

Passengers

Implementing the corridor will significantly reduce rail travel time, and consequently increase frequency of train services on various international relations along the corridor, therefore generating shifts from road or air to rail but also, as already mentioned, traffic induction.

The corridor's full implementation would **increase rail shares** in particular for traffic between France and Spain (from 2% today to 12% in 2030) and between France and Italy (from 4% to 8%).

The table below summarizes the forecast for the whole market area:

Total market area (1000 pax / year)	2010	2030 trend scenario	2030 with corridor implementation	Diff. Corridor - trend
Road	46 261	63 539	61 125	-2 413
Rail	3 001	4 061	10 011	5 950
Air	79 659	110 179	108 153	-2 026
Total	**128 921**	**177 779**	**179 289**	**1 510**
Rail share	***2,3%***	***2,3%***	***5,6%***	

Implementing the corridor could thus increase the international rail traffic by nearly 6 million passengers/year in 2030. This increase would come from modal shifts from air (2 Mpax), modal shifts from road (2,4 Mpax) and traffic induction (1,5 Mpax). Rail share would go from 2,3% to 5,6% on the overall market area, which represents more than a doubling of the rail traffic with respect to the do-nothing scenario.

Conclusions drawn from the transport market study

- The implementation of the Mediterranean corridor represents a major opportunity to **shift** important volumes of **freight from road to rail**, with a potential shifting of 40 million tons of goods from road to rail by 2030. Nevertheless, the realization of this objective needs a fully upgraded and interoperable infrastructure with adapted services and rail-road terminals.

- Developing the corridor will also lead to an increased competiveness of rail in the international passenger traffic, with a potential increase of 6 million passengers per year by 2030, 2 million of which shifted from air traffic. This would more than double the rail share.

- The connections to the ports are a key element for the success of the corridor.

- The short sea shipping services along the corridor between European countries or with northern Africa are also a strong and growing element of the maritime dimension of the corridor.

- The IWW can play an important role in the future for the Mediterranean Corridor, despite the current low traffic volumes. Especially by connecting major industrial zones to seaports, they could offer an interesting alternative to road or rail transport for certain types of goods.

- The corridor implementation will also have important effects for national and regional traffic, improving travel time on sections with strong national flows (Nîmes – Montpellier - Perpignan, Lyon – Chambéry / Grenoble, Milano – Venezia - Trieste…) and creating opportunities for new high performance regional services where congested nodes are relieved.

4. Critical issues on the Mediterranean Corridor

In order to fully develop of the Corridor certain aspects have to be addressed which are critical for ensuring the efficient and sustainable use of the infrastructure capacity and for guaranteeing the Corridor's full interoperability. These so-called critical issues relate to capacity, interoperability, intermodality as well as administrative and operational barriers.

Experience has shown that the development of infrastructure is most difficult on cross-border sections when technical and financial difficulties are exacerbated by the fact that two Member States have to work together. This is why the European Coordinator's work needs to focus on these sections first.

Based on the thorough work presented in the Corridor Study, including the intensive consultation of stakeholders in the framework of the Corridor Forum and its four meetings held in 2014, as well as based on consultations between the Coordinator and the Member States the following picture can be drawn of the main critical issues of the Mediterranean Corridor.

Cross-border sections

- **Spain-France:** The new HS line between **Figueres** and **Perpignan**, which opened on 1 January 2013, offers capacity, fluidity and safety; but it is still underutilized despite significant growth between 2013 and 2014: fewer than 5 freight trains are dispatched per day. In order to run on the new HS line, freight locomotives need to be able to handle three different voltages and three different signalling systems. There are no locomotives available on the market capable of coping with these requirements. The few freight trains currently running on the line are pulled by retrofitted HS passenger locos.

- **France-Italy:** the steep gradient of the existing railway line on the French side of the border requires double push locomotives for regular sized freight trains (single loco trains are limited to 650 tons). In addition, the existing sidings and passing tracks restrict further the train lengths making the line uncompetitive.

The **new railway link Lyon-Turin** with a 57km base tunnel as its 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, Spain and Italy, and Spain and central and Eastern Europe are hampered. As a consequence freight flows are confined to road transport and deviated to other routes causing congestion and creating additional costs.

- **Italy-Slovenia:** the existing line between Trieste/Aurisina and Divača needs to be up-graded to meet TEN-T standards. However, recent traffic forecasts suggest that the capacity of the up-graded line will be sufficient to accommodate traffic beyond 2030.

- **Slovenia-Hungary:** an up-grading of this cross-border section is on-going. The capacity limit of this single-track line may become an issue in the long-term.

- **Slovenia-Croatia:** on the Croatian side of this cross-border section, which is part of the line connecting the two capitals Ljubljana and Zagreb, the line suffers from speed limitations as well as limitations on train length. The line is not in conformity with TEN-T standards and needs up-grading.

- **Croatia-Hungary:** this cross-border section (Botovo-Gyekenyes) 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.

Capacity issues

The main problems relating to capacity and line saturation along the Corridor lie in the large urban areas and are summarised below.

- The realization of the potential traffic of the Lyon – Turin international section needs the solving of major capacity issues in the Lyon node and from Lyon to Saint-Jean de Maurienne. For example, there could be potentially about 200 passenger trains per day on the existing 2-tracks line between Chambéry and Montmélian in 2030. This is clearly not compatible with the expected number of freight and rolling motorway trains potentially using the cross-border section if no new link is created.

- The Lyon node is already critical today and its situation prevents any significant development of rail traffic coming from Spain or from the port of Marseille to northern Europe, Switzerland or to Italy. An alternative path to Switzerland or Italy might be available in the short term via the newly electrified line between Valence, Grenoble and Chambéry but with quite limited capacity.

- The Turin Node is an essential point of the national railway system, both concerning its function as a node for the HS/HC system and for the Turin-Lyon corridor and its metropolitan mobility value. The planned interventions for the node, both infrastructural and technological, are essential in order to increase its capacity and enhance the intermodal integration.

- In relation to other **urban nodes** (i.e. Madrid, Barcelona, Marseille, Lyon, Torino, Milano, Venice, Ljubljana, Zagreb and Budapest), bottlenecks exist due to the overlapping of different types of rail traffic (metropolitan, regional, long distance and freight). The planned investments are necessary to relax such constraints. For example, once all major generators connected, there could be some capacity issues in

the urban area of **Barcelona**, with about 100 – 150 freight trains per days on some sections having to share tracks with heavy commuter rail traffic; this issue would require a more in-depth analysis of local traffic.

- Between **Montpellier and Perpignan** capacity issues will become critical at the latest once all connections to Spanish seaport, industrial plants and the other logistic terminals will be upgraded at UIC gauge. In addition, the new line will become necessary to realize the potential demand of the corridor, since, between Montpellier and Beziers by 2030 there could be a demand equivalent to 140 freight trains, 100 regional trains and about 60 high-speed passenger trains. At that moment, the total resulting traffic cannot any longer be accommodated on the existing line alone.

- Given the present traffic and its potential development, and taking into consideration the planned expansion of the port terminal infrastructure, the upgrade of the line between **Divača** and **Koper** is an absolute priority: there are currently 80 trains/day using this single-track line; this number is expected to increase to 19 million tons and 135 trains per day by 2030.

- The need for a new line is also clear in the **central part of Slovenia**, where freight traffic could reach over 200 trains a day. Such traffic does not appear to be easily mixed with the passenger traffic in the Ljubljana area.

Interoperability and intermodality issues

- The **"last mile" connections** of main industrial sites, ports and intermodal logistics terminals to the main transport network (in particular via rail or IWW) have to be guaranteed and/or need to be enhanced in order to ensure appropriate capacity and service level in comparison to their needs and assure that the development of the transport system has an impact on the socio-economic growth of regions. Thus, the issue of the last mile linking the core network to production, exchange or consumption sites is among the first priorities to be addressed.

- The realization of the international rail traffic potential in Spain can only be achieved by a **full UIC gauge connection** from the main traffic generators to the border.

- In order to enhance the modal shift, a **substantial improvement** of the corridor **interoperability** has to be ensured removing the remaining restrictions in particular in terms of train length, axle load and signalling systems (especially on the Eastern part of the corridor)**.** While this effort can only be made gradually, this issue is only solved when the whole corridor has reached the common standards, and even a very small section remaining with lower standards in the central part of the corridor has enormous negative effects on the Corridor's potential on the whole.

- Particular attention needs to be given to **ERTMS** where the implementation rate is still very low in most of the corridor countries. Especially in France, the lack of ERTMS deployment will become critical on the section from Spanish border to Avignon, and the Lyon node.

The tables on the next pages show the key critical issues in the six corridor countries per transport mode.

	Spain	France	Italy	Slovenia	Croatia	Hungary
RAILWAYS						
Bottlenecks: **Single track sections**	Vandellós –Tarragona Algeciras-Bobadilla (not electrified line with high gradients.)	St-André le Gaz – Chambéry.		Koper – Divaça, Ormož – Ljutomer.	All sections belonging to the Corridor are single track lines (except Dobova-Zagreb-Dugo Selo).	SI/HU border - Zalolovo-Székesfehérvár. Gyekehyes-Pusztaszabolcs. Nyiregyhàza – Mezozombor.
Congested double track sections (> 100 trains / day) or sections with capacity issues due to mixed traffic (passenger and freight trains)	Heavy commuter train traffic on double track: Martorell- Castelbisbal, near Barcelona. Heavy mixed traffic on double track: Barcelona-Sant Vicençs de Calders- (971 trains per week) Valencia-Xátiva (1016 trains per week) Madrid-Guadalajara (816 trains per week) Madrid-Aranjuez (1340 trains per week).	Mixed and intense use of the infrastructure, with heavy commuter train traffic: node of Lyon; Moirans – Grenoble; Chambéry – Montmélian; Nimes – Montpellier	Capacity reductions and related congestion on specific sections: Treviglio – Brescia; Avigliana – Turin; Venice S.L-Venice Mestre. Mixed use of the infrastructure (nodes of Torino, Milano and Milano Lambrate).	Capacity constraints on the sections (e.g. Zidani Most-Celje, Ljubljana node).	Mixed use of the infrastructure (e.g. DugoSelo –Zagreb).	Heavy mixed traffic on out-dated Szolnok-Szajol- Püspökladány section, including a worn-down Szolnok station. (The upgrade of the line Szajol-Püspökladány is under construction.)
ROADS						
Limitation of capacity and related congestions	Madrid (M-50 Motorway), Barcelona (AP-7 Motorway) Valencia (A-7 Motorway) Single lane around Motril (A7 Motorway).	Lyon and the Rhône Valley (A7 motorway); Montpellier and between Perpignan and the Spanish border (A9 motorway).	Sections around Milan and IT/SI cross border.	Ljubljana node		Missing motorway connection to Ukraine (23 km);and to Slovenia (Letenye-SI/HU border).
AIRPORTS						
Connection to main rail network	No direct connections to the main railway network.	No direct rail connection with Marseille airport.	No direct rail connection: Venice, Milano Linate & Orio al Serio. Need to upgrade last mile link with Milano-Malpensa.	No direct rail connection: Ljubljana airport	No direct rail connection: Zagreb airport	No direct rail connection: Budapest airport

	Spain	France	Italy	Slovenia	Croatia	Hungary
PORTS						
Port infrastructure	In the Spanish ports investments are necessary to facilitate shunting, reduction of travel times and increase of available paths.	Operational bottlenecks on the railways connections to Marseille and to Fos port. The waterborne accesses to both ports need improvement.	Limited available draughts and related constraints for certain type of traffic (e.g. Venice, Ravenna). Limited warehouse space for Trieste port.		Small container storage area. Long vessel waiting times re-scheduling due to port congestion. Insufficient mooring space. Not flexible infrastructure to increasing ship size (Port of Rijeka).	
Rail/road access to the port	Limited access due to missing UIC gauge. Although the main existing bottlenecks are mostly referred to rail, also road connections to ports should be improved.	Rail access and RRT in Marseille and Fos to be improved	Reduced rail accessibility and need to improve rail infrastructure connections. In particular, at Venice port served only by a single-track rail connection.	Divaca-Koper Port: a single rail track is at capacity limit. A1 motorway as main acess route connecting Koper to Divača and Ljubljana.	Limited rail access to Rijeka port.	
Road-rail terminals						
Terminal infrastructure, rail access	All terminals in the main nodes (Madrid, Zaragoza, Barcelona) have limited usable tracks and do not have UIC links. Limited access capacity due to limited usable track lengths (Abroñigal Logistic Terminal - Madrid).	Reduced productivity due to limited usable track lengths (Avignon – Courtine; Le Boulou; Perpignan; Marseille – Canet; Lyon – Venissieux). Limited accessibility from Venissieux to the south.	Lack of terminal capacity in Milano Smistamento and Trieste C.M.	Limited capacity at Ljubljana RRT		
IWW						
IWW infrastructure (target: minimum class IV of CEMT classification)		Class IV not reached yet on the Canal du Rhône à Sète (this section is still not included in the Mediterranean corridor alignment)	Accessibility of the western part of the IWW (between Cremona Milan and Casale Monferrato) is limited to large vessel due to a missing lock.			
Integration between IWW and other modes		Rail access to the port of Lyon to be improved (the not electrified line provoke complex movements).	Lack of direct transhipment between IWW and sea port; Lack of rail connection (e.g. Mantova port).			Technical features (e.g. draught) of Danube below EU average. Same is true for ship loading capacity, port density, port services.

5. Objectives of the Mediterranean Corridor

Identification of corridor objectives

It almost goes without saying that developing the Corridor as the backbone of international exchanges between the Eastern and Western parts of Europe will contribute to the economic growth and competitiveness of these countries. 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).

The TEN-T Regulation defines the general objective of the TEN-T network as to strengthen the *social, economic and territorial cohesion* of the Union and contribute to the creation of a single European transport area. It shall demonstrate European added value by contributing to the objective in the categories: (i) territorial and structural cohesion; (ii) efficiency between different networks; (iii) transport sustainability; (iv) and increasing the benefits for the users.

Based on this general objective 8 operational objectives have been identified for the Mediterranean Corridor:

- Removal of infrastructure bottlenecks and bridging of missing links;
- Upgrading of infrastructure quality to TEN-T level;
- Efficient use of infrastructure;
- Optimal integration and improved interconnection of transport modes;
- Optimal interconnection of national transport networks;
- Promoting economically efficient and high-quality transport;
- Promoting resource-efficient use of infrastructure;
- Reduction of congestion.

Identification of Key Performance Indicators (KPI)

KPIs are based on the defined general and operational objectives. The definition of KPIs follows the differentiation between general and operational objectives, with higher-level and operational KPIs respectively, as presented below.

The KPIs below should be used to assess the achievement of the corridor objectives in the further development of the Corridor.

In order to measure progress on the general objective, three principle KPIs are defined:

Objective	KPI
Economic efficiency	Transport costs
Clean transport	Modal split
Cohesion-regional cooperation and trade	Freight and passenger flows

The relevant indicators linked to the specific objectives are listed below.

Operational Objective	KPI
Removal of infrastructure bottlenecks and bridging missing links	Number of identified bottlenecks (infrastructure, capacity)
Upgrading of infrastructure quality	Improved technical standards per mode of transport (% of electrification, double track, standard gauge, etc.)
Efficient use of infrastructure	Freight and passenger flows Infrastructure utilisation rate
Optimal integration and improved interconnection of transport modes	Modal split (amount of freight (tons) or travellers (pax) transported by a particular mode of transport) Use of common traffic management systems Presence and use of intermodal terminals Availability of last mile infrastructure
Optimal interconnection of national transport networks	Border waiting time Use of common standards and procedures
Promoting of economically efficient and high-quality transport	Transport time Mean speed Frequency Freight security – availability of secured parking Road safety
Promoting resource-efficient use of infrastructure	Emissions (NOx, SOx, PM in terms of gr/tonkm) Availability of refuelling infrastructure for alternative fuels
Reduction of congestion	Mean speed

6. Recommendations and outlook by the European Coordinator

The year 2014, the first year of the new corridor approach, marks the successful start into the implementing of the core network corridors. A lot has been achieved: there is agreement on the alignment and we have gained a detailed overview of the state of compliance of the Corridor infrastructure with the TEN-T requirements. The transport market study analysed the socio-economic situation of the Corridor as well as its transport flows. For the first time there is a clear picture of the investments needed on the Corridor for all modes to reach the EU targets of 2030. The project list in the annex to the Corridor Study offers a first picture of the individual measures to be taken, together with timing, financial requirements and funding sources.

It is against this background that my recommendations should be read. It will not come as a surprise that they flow from the critical issues discussed earlier on in the Work Plan. As a general rule all interventions which resolve critical issues need to be tackled. In addition, it is the duty of the European Coordinator to recommend certain priorities, given that not all critical issues can and should be addressed at the same time.

Based on the analysis of the Corridor and on the wide consultation with stakeholders in the Corridor Forum but also in the Member States I conclude that efforts need to be concentrated primarily in these areas in order to development the Corridor:

- Completion of missing key sections;
- Ensuring full interoperability;
- Ensuring full connectivity of ports;
- Implementation of ERTMS;
- Development of urban nodes.

Completion of missing key sections

The new railway link Lyon-Turin is the key section on which the optimal functioning of the whole corridor hinges. Without this new link the Corridor will not be able to perform its role of the major east-west axis south of the Alps.

Similarly, the Montpellier-Perpignan section will become crucial to utilise the full potential of the newly built railway connection in UIC gauge between France and Spain. The further development of this section will be looked at in the light of the traffic evolution in order to avoid that the section becomes a bottleneck in the medium term severely hampering the growth potential of Spanish traffic generators (ports, industrial plants, logistic terminals) and hindering Spain to achieve a meaningful modal shift from road to rail on the heavily congested road connection along the Mediterranean coast.

Several cross-border rail and also road connections in the eastern part of the Corridor need to be addressed under this heading as well.

Ensuring full interoperability

The completion of the new HS line between Figueres (Spain) and Perpignan (France) was a historic event, creating the first interoperable link with the Iberian peninsula. However, for various reasons, this interoperability, in practice, appears to be only partial and in operational terms – as far as freight is concerned – non-existent. To overcome this situation a structured cooperation between the two Member States is urgently needed.

In general, the realization of the rail potential international traffic in Spain can only be achieved by a full UIC gauge connection from the main traffic generators to the border. But also on the remaining railway sections of the Corridor, delivering interoperability means agreeing on the full deployment of the UIC gauge.

In order to enhance the modal shift, 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 (especially on the Eastern part of the corridor). While this effort can only be made gradually, this kind of issue is only solved when the whole corridor has reached

the common standards, and even a very small section remaining with lower standards in the central part of the corridor has enormous negative effects on its potential.

Ensuring full connectivity of maritime and inland ports

Major investments have been made over the last few years, all resulting in a significant growth in the use of ports and of their influence areas (hinterlands). 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) developments 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 mail connection"); (3) long distance connections because of their bottlenecks and missing sections affect the development of services with origin and destination in the port.

Implementation of ERTMS

In order to reach our final target to achieve an interoperable and competitive railway network, three conditions need to be fulfilled along the corridors: sufficient infrastructure quality, harmonisation of national rules throughout Europe and introduction of ERTMS. To speed up this process and to show tangible results in the railway sector, we need to accomplish quick wins through implementing short-term and less costly projects. Implementation of interoperability actions, such as the 740m train length standard, harmonisation of operation and authorisation rules would have a direct impact on productiveness.

Detailed ways how to accelerate ERTMS equipment along the core network corridors will be described in a separate Work Plan by the European Coordinator. In his report, the ERTMS Coordinator will present a so called Breakthrough programme, which has been established in close cooperation with the railway sector and consists of a limited number of objectives to be reached by 2016, including a review of the current European Deployment Plan and the identification of a strategy for ERTMS equipment by 2030, as laid down in Regulation (EU) 1315/2013.

Development of urban nodes

It became quite apparent in the Corridor Study 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 not only be given to passenger services but equal treatment should be given to freight services using the same infrastructure. While the general problem is similar in all urban nodes, the specific situations of the various urban nodes differ and need to be studied individually.

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 of all the major nodes like Madrid, Lyon and Milan, but also Verona, Venice and Budapest.

Outlook

The Mediterranean Corridor has high potential to develop into a major transport axes serving all corridor countries with better connections among each other but also towards the other EU Member States. The task ahead is to fully tap into this potential by developing the corridor to a maximum. This will also help stimulate growth in times when and countries where economic development is stagnant.

This work plan is the first step towards this future development of the Corridor. Further steps in the form of revisions of this work plan will follow. Similarly, the Corridor Study will be further developed: a first update and further deepening of the analysis and the resulting work plans will be undertaken by December 2016 followed by a second update in 2018.

As European Coordinator for the Mediterranean Corridor, I see it as my main task to bring all Member States and other stakeholders together in a transparent and constantly deepening dialogue. The Forum is the ideal place for this, but I will also directly address the Member States and other stakeholders in bilateral meetings, visiting them and witnessing the progress on the ground.

When building the Corridor and thus creating the truly European Core Network a change of minds has to take place: we need to depart from national perspectives and adopt a corridor and a network perspective where priorities are set to achieve the common goal: implementing the core network by 2030.

One way to do this is to improve the governance: I will thereby continue to particularly value the multilateral/Intergovernmental, cross-border cooperation between Member States, like in the case of Lyon-Turin and Trieste-Divača. As regards Lyon-Turin the transformation of the old project promoter into the new public promoter is a major step forward. I envisage such a structured cooperation also in the case of Spain and France, where important issues regarding the new cross-border section are at stake.

I will continue to seek synergies with the Mediterranean Rail Freight Corridor, notably in addressing the administrative and operational barriers on the historic lines, especially on sections where new cross-border projects are being developed and the historic lines need to serve still as main line in the medium term. The use of the infrastructure will need to be improved at best possible terms to make the corridor not only a distant dream but rather an immediate reality, serving citizens and business alike.

Finally, I will propose that the work of the Mediterranean Corridor will be seen in the longer framework set by the TEN-T and CEF Regulations and therefore continue to be monitored and fine-tuned over the years to come, making the results of 2014 irreversible through the progress on the ground and projects being realized.

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Corridor website:

http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/med_en.htm

Background

(available at: http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/corridor-studies_en.htm)

- Corridor Study – Final Report
- List of projects (Annex of the Final Report)
- TENtec maps

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