



European
Commission

Orient East Med



Work Plan of the
European Coordinator
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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 *Orient East Med* corridor work plan

European Transport policy reached a major milestone in 2014 with the adoption of the TEN-T and CEF Regulations leading to a more efficient transport policy.

The core network approach linking urban nodes, ports, airports and transport terminals maybe considered as the backbone of a European transport area, which guarantees a connection to the comprehensive network with all European regions.

This multi modal network approach supported by financial instruments can contribute to boost the competitiveness of the European economy, contribute to sustainable growth and development of the internal market.

This new concept of corridors underlines the need to go further than national visions for transport and to encompass a trans-border vision on the way people and goods can cross Europe.

The main interest of the Orient East Med corridor, crossing nine Member States, including seven Member States benefiting from the cohesion funds support, is based on the absolute necessity for cooperation between states independently of their current socio-economic trends. Any investment on the corridor in any of the nine countries will immediately bring an added value all along the corridor.

In June 2014 I was given the mandate as European Coordinator for the Orient East Med Corridor. Regulation (EU) 1315/2013 defines that *each European Coordinator shall, by 22 December 2014, submit to the Member States concerned a work plan analysing the development of the corridor. After it has been approved by the Member States concerned, the work plan shall be submitted for information to the European Parliament, the Council and the Commission. The work plan shall include, in particular, a description of the characteristics, cross-border sections and objectives of the core network corridor.*

I paid a particular attention to the priorities of the guidelines: cross border bottlenecks, interoperability and multimodality. I also reviewed the situation in the light of the cohesion funds supporting mature projects until 2016 and its articulation with the objectives of the CEF.

The Orient/East-Med Corridor is a long north west – south eastern corridor which connects Central Europe with the maritime interfaces of the North, Baltic, Black and Mediterranean seas. It runs from the German ports of Bremen, Hamburg and Rostock via the Czech Republic and Slovakia, with a branch through Austria, further via Hungary and Romania to the Bulgarian port of Burgas, with a link to Turkey, to the Greek ports of Thessaloniki and Piraeus and a "Motorway of the Sea" link to Cyprus. It comprises rail, road, airports, ports, rail-road terminals and the Elbe river inland waterway.

The Orient/East Med Core Network corridor includes sections of former TEN-T Priority Projects (PP 7, PP 22 and PP 21, PP 23, PP 25 partially) and of ERTMS Corridors (D and parts of B, E, and F). The Rail Freight Corridor RFC "Orient / East Med" has been adapted to the same alignment.

Several segments of the Orient/East Med Core Network Corridor are coinciding with other of the 9 Core network corridors, such as the Rhine-Danube Corridor (approx. 1000 km) and on shorter sections, the North Sea / Baltic corridor, the Scandinavian-Mediterranean corridor and the Baltic Adriatic corridor.

The intensive analysis work realised in 2014 has only been possible through the setting-up of a Corridor Forum. This forum met four times over the year and included the growing and active participation of representatives of the involved ministries of the Member States, the infrastructure managers (public and private) for railways, ports, inland navigation, airports and roads as well as representatives from the regions along the corridor. Different services of the European Commission have been actively involved in support to the staff of DG MOVE e.g. DG REGIO and INEA, and the European Bank for Investment also participated in the dialogue and exchange process.

Two ad-hoc working groups met to analyse more in depth the specific expectations and proposals of the European Ports as well as those of the regions along the OEM corridor.

The study who analysed in details the characteristics of the Orient / East-Med Core Network Corridor has been conducted by the group of international consultants, which consists of iC consulenten Ziviltechniker GesmbH, Austria (Lead); Panteia B.V., Netherlands; Railistics GmbH, Germany; ITC Institute of Transport and Communication OOD, Bulgaria; SYSTEMA Transport Planning and Engineering Consultants Ltd., Greece; Prodex d.o.o., Slovakia; University Politehnica of Bucharest, Romania and PricewaterhouseCoopers Advisory SpA, Italy.

The very constructive debates and exchanges I had the pleasure to chair in 2014, being it in the corridor forums, the ad-hoc working groups or during my official visits to the countries along the corridor, combined with the content of the overall study of the corridor characteristics have given me a good insight into the strengths and weaknesses of the corridor.

2. Characteristics of the *Orient East Med* Corridor

2.1 Corridor alignment

The Orient/East-Med Corridor connects North/central Europe with the maritime interfaces of the North, Baltic, Black and Mediterranean seas, making the best of Motorways of the Sea ports, crossing 9 Member States. It will foster the development of those ports as major multimodal logistic platforms and will improve the multimodal connections of major economic centres in Central Europe to the coastline, using rivers such as the Elbe and the Danube.

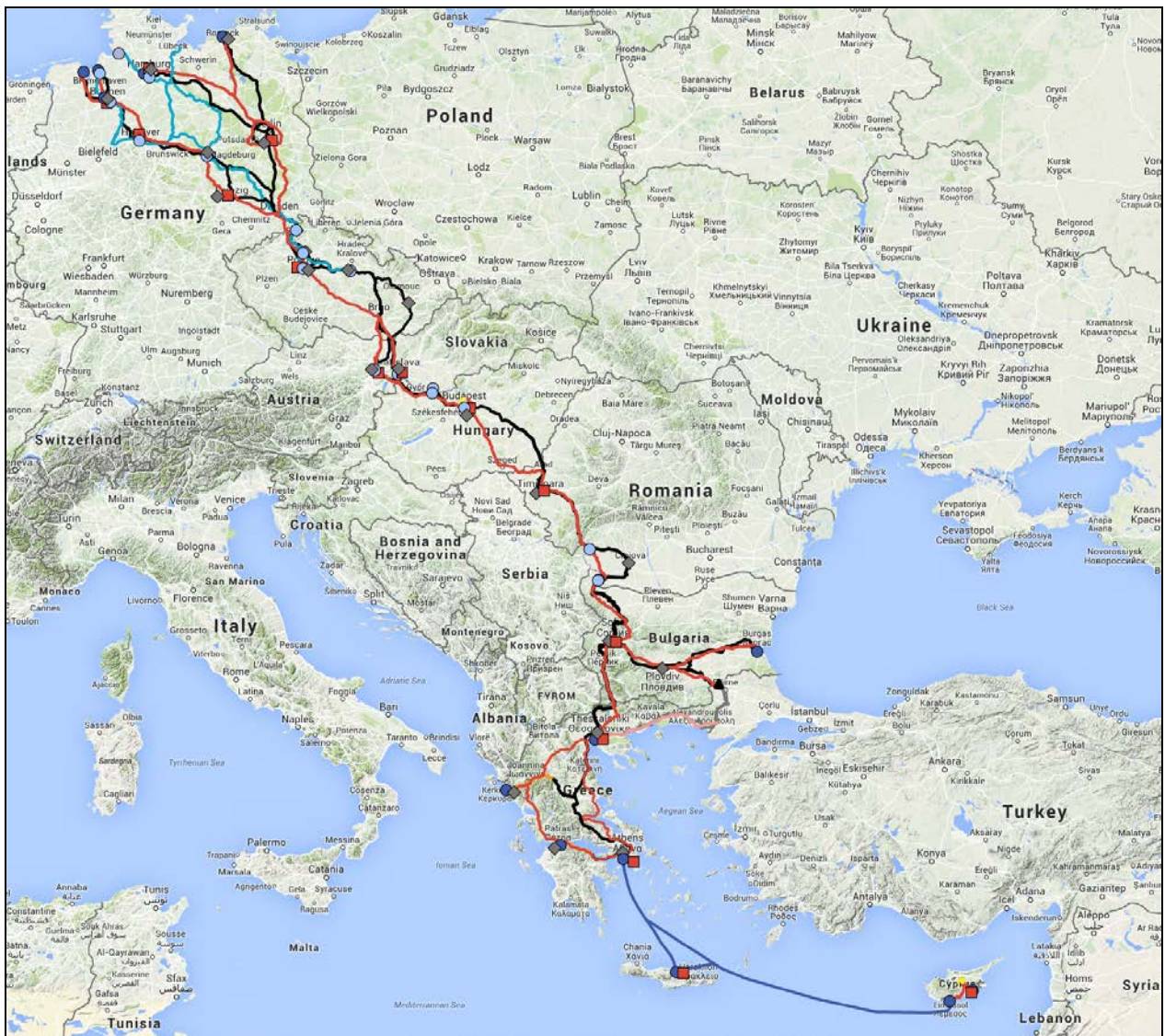
The 9 Member States involved are (in alphabetical order): Austria, Bulgaria, Cyprus, Czech Republic, Germany, Greece, Hungary, Romania, and Slovak Republic.

In Cyprus, no rail infrastructure is deployed. Maritime infrastructure exists in 4 countries, namely Bulgaria, Cyprus, Germany and Greece.

In terms of IWW, the OEM Corridor Study will put emphasis on the Elbe-Vltava IWW system (Brunsbüttel – Mělník – Praha / – Pardubice; Germany and Czech Republic) and the IWW link from Magdeburg to Bremerhaven (in Germany).

According to the Regulation No. 1316/2013¹ the Orient / East-Med corridor (OEM corridor) and clarifications agreed with the Member States consists of the following parts:

- Rostock - Berlin
- Brunsbüttel – Hamburg – Berlin – Dresden
- Bremerhaven / Wilhelmshaven – Magdeburg – Leipzig / Falkenberg – Dresden
- Dresden – Ústí nad Labem – Mělník/Praha – Kolín
- Kolín – Pardubice – Brno / Přerov – Wien/Bratislava – Győr – Budapest – Arad – Timișoara – Craiova – Calafat – Vidin – Sofia
- Sofia – Plovdiv – Burgas
- Plovdiv – Svilengrad - BG/TR border
- Sofia – Thessaloniki – Athina – Piraeus
- Athina – Patra / Igoumenitsa
- Thessaloniki / Palaiofarsalos – Igoumenitsa
- Piraeus – Heraklion – Lemesos – Lefkosia - Larnaka



¹REGULATION (EU) No 1316/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013

The length of the corridor infrastructure sums up to approximately 5.900 km (rail), 5.600 km (road) and 1.600 km of IWW. The number of core urban nodes along the Orient/East Med corridor is 15, with the majority located in Germany (5) and Greece (3), as well as one per other Member State. The same number applies for core airports, from which 6 are dedicated airports to be connected with high-ranking rail and road connections until 2050. Furthermore, 10 Inland ports and 12 Maritime ports are assigned to the corridor, as well as 25 Road-Rail terminals.

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

The OEM Railways Network and Rail Road Terminals

The infrastructure of the railway network along the OEM corridor is in considerable parts of the alignment not compliant with the technical characteristics thresholds set out by Regulation No. 1315/2013 regarding the key infrastructure parameters track gauge, operational speed (line speed), train length, axle load, electrification and signalling and telecommunication.

Concerning **gauge and number of tracks**, all OEM corridor lines have a gauge of 1435 mm. Most lines are at least double-tracked (approx. 73%). Single line sections are as follows:

- in Germany:
 - Rostock Hbf – Kavelstorf,
 - Rostock Seehafen – Kavelstorf,
 - Sande – Wilhemshaven/Jade Weser Port
- in Slovakia and Hungary:
 - Petržalka – SK/HU Border – Hegyeshalom,
 - Békéscsaba – Lökösháza - HU/RO Border,
- in Romania:
 - Border HU/RO - Curtici
 - Arad – Strehaiia,
 - Craiova – Calafat, Border RO/BG,
- in Bulgaria:
 - RO/BG border – Vidin – Mezdra
 - Sofia – Kulata – BG/EL border,
 - Krumovo – Svilengrad – BG/TR border,
- in Greece:
 - BG/EL border – Promahonas – Thessaloniki
 - Lianokladi – Tithorea
 - Palaiofarsalos – Kalambaka.

Regarding **operational speed**, there are discrepancies in the Czech Republic (Děčín - Ústí nad Labem (freight link), Kralupy n.V. - Praha, Blansko - Brno), in Slovakia (Petržalka - Border SK/HU) and in Hungary (Kelenföld – Ferencváros within Budapest node), where line speed is 80 km/h. In Bulgaria, the operational speed is lower than 100km/h, specifically along the section Vidin - Sofia, reaching a speed of 70/80 km/h, while parts of the lines Sofia - Kulata and Sofia - Plovdiv - Burgas have speed limits of only 60 km/h: Pernik - Radomir, Septemvri - Plovdiv, and Tserkovski – Karnobat. Along the Bulgarian rail section Mihaylovo – Dimitrovgrad the operational speed is only 45 km/h. In total, approx. 15% of the OEM rail network is not compliant with the requirements of the Regulation.

The operation of **740 m trains** is also not possible due to infrastructural, administrative or timetable-related/operational reasons, on several sections of the corridor, including all corridor sections in Czech Republic, Slovakia, Austria, Romania (except of the sections Timișoara – Caransebes and Filiași – Craiova) and Bulgaria (except of a number of sections between Plovdiv - Burgas and Svilengrad – Turkish Border), as well as one section (Hegyeshalom – Rajka) on the Hungarian network (in total approx. 46% of the OEM rail network).

In contrast, 85% of the rail network along the OEM corridor is compliant with the **minimum axle load** threshold of 22.5 t. Exception in this regard are the entire rail network in Romania, and a number of line sections in Greece (Promahonas – Thessaloniki, Domotikis – Tithorea and Kiato – Patra) and in Hungary (Budapest-Ferencváros – Cegléd and Békéscsaba – Lökösháza). Additionally, in Hungary, there is a special situation on the line Budapest – Hegyeshalom, where axle load of 22.5 t is permitted with speed restriction of 120km/h (above the limit of 100km/h). For the section Budapest – Ferencváros – Cegléd, the speed limitation is 80km/h for 22,5t axle load.

Most of the OEM rail network is **electrified** (approx. 90%), having three different current systems in use: AC 15kV / 16.7 Hz (Germany and Austria), AC 25kV / 50 Hz (Czech Republic (South), Slovakia, Hungary, Romania, Bulgaria and Greece) and DC 3kV (Czech Republic North). Diesel traction is required only on the sections Oldenburg – Wilhelmshaven in Germany, Craiova – Calafat in Romania, Dimitrovgrad – Svilengrad in Bulgaria and Promahonas – Thessaloniki, Domokos – Tithorea and Inoi – SKA – Piraeus, and Palaiofarsalos – Kalambaka in Greece.

Regarding **signalling² and telecommunication systems**, at present, for both **ERTMS** subsystems (ETCS and GSM-R), the national systems are still predominantly used on the OEM rail network. There is a considerable lack of ERTMS implementation, with differences between Member States, as well as with regard to the two components GSM-R and ETCS. Regarding GSM-R, 51% of the OEM rail network is not compliant with the requirements of the Regulation, while regarding ETCS installation (86%) and operation of railways (90%) are not compliant.

By not meeting the requirements of the Regulation, there are cross-border and interoperability issues along the OEM rail network.

Capacity utilisation differs greatly between the northern and the southern part of the OEM rail network. Bottlenecks exist on some line segments (e.g. in Budapest / Czech Republic).

Regarding **Rail Road terminals**, there are in total 25 Core Rail Road terminals along the OEM corridor, most of which are located in Germany (8), Czech Republic (5), Austria (3) and Greece (3).

All rail-road terminals on the OEM corridor are linked with the national road and rail networks, although there is in some cases as identified in the overall corridor study, a need to improve the quality of "last mile" connection or to solve capacity problems.

Regarding the state of development of Rail Road terminals, there are differences between the northern and southern corridor parts, ranging from a lack of development

² i.e. Railway control systems

to a dense network of terminal locations, with limited capacities both in the terminals and the connecting rail and road network.

Table 1: Status of Rail infrastructure compliance on Orient/East-Med corridor (2014)

Parameter	Length share of non-compliant sections
Operational speed	20%
Train length	46%
Axle load	15%
Electrification	10%
Number of tracks (at least double track)	20%
Signalling systems (ETCS)	86%/ 90% ³
Telecommunication system (GSM-R)	51%

Based on this analysis, a train travelling from Athína (EL) to Hamburg (DE) would have to comply with the following standards:

- locomotive equipped with 7 different signalling systems; alternatively it would have to be changed 6 times
- even if the locomotive would be equipped with the 3 required different electrification systems, it would have to be replaced by diesel locomotives 4 times
- maximum length of 600 m, except on Bulgarian sections where the maximum train length is only 445 m,
- maximum axle load of 20 Tonnes,
- it would run at 80 km/h or lower on approximately 510 km.

The lack of technical compliance with standards and the lack of inter-operability constitute the major encumbrance for the efficiency of this mode of transport, especially in comparison with road transport.

The OEM IWW Network and the Ports.

The OEM inland waterway network analyses the Elbe, the Elbe-Seitenkanal, the Elbe-Lübeck-Kanal, the Mittellandkanal, the Weser, and the Vltava.

The Danube is addressed in the analysis of the Rhine/Danube Corridor.

With regard to the requirement of Regulation No.1315/2013, the key infrastructure parameters examined within this study are the length of vessels, maximum beam, minimum draught, tonnage and compliance to the requirements of CEMT class IV in particular regarding bridges and locks. The basic characteristic of the **Elbe** are the persisting unstable water levels, as they are subject to natural fluctuations, resulting in extremely low fairway depths, especially in dry seasons. The latter has significant impact on inland shipping regarding navigability and transportable tonnage, making also the respective sections commercially non-navigable. All-season stable navigation conditions cannot be guaranteed. For this reason, the possible loading depth is along long sections dependent on the water level, notably in the sections between Geesthacht (near Lauenburg) up to the German/Czech border. In the Czech Republic, the sections Mělník

³ i.e. 86% regarding ETCS installation and 90% regarding ETCS under operation.

- Pardubice and Mělník – Praha, have non-compliant structures: insufficient draught and bridge clearance.

Apart from the insufficient navigability, the problem of flooding is another important issue along the Elbe, which also has considerable large economic, social and ecological impacts. There are various environmentally sensitive areas located along the Elbe (alluvial forests and floodplains), which are partly listed as NATURA 2000 protected areas.

Regarding ship length on the Elbe, barges with dimensions of 110 m length and 11.45 m width can operate between Geesthacht and Mělník, while in the section Mělník – Přelouč the admitted length is 84 m and the width 11.45 m. On Vltava it is possible to navigate with barges of 110 m length and a width of 10.5 m width. However, due to the inconsistency of the adequate fairway depth, the maximum loading capacity can temporarily be reduced due to draught limitations.

The **Vltava** waterway is also characterized by low height under bridges (4.5 metres), locks problems, limited fairway sections, as well as flooding problems.

On the **Elbe-Seitenkanal**, barges with 110 m length, 11.40 m width and 2.80 m draught and pushed convoys of 185 m length, 11.40 m width and 2.80 m draught can be used in principle. However, due to length limitations regarding the length of the chambers of the ship lift Lüneburg near Scharnebeck (maximum length of 100 m), the former are not approved for a continuous ride. For this reason, only barges that correspond to these dimensions can pass, while pushed convoys have to be decoupled for the passage and lifted or lowered individually.

On the **Mittellandkanal**, barges with the dimensions 110 m length, 11.45 m width and 2.8 m draught, as well as pushed convoys of 185 m length, 11.40 m width and 2.80 m draught can operate, while on the Mittelweser, barges with the dimensions 85 m length, 11.45 m width and 2.5 m draught can be used. However, the section between Minden and Bremen is currently upgraded to allow the operation of ships with a length of 110 m and a width of 11.45 m in future years.

On the **Elbe-Lübeck-Kanal**, barges up to 80m length, 9,50m width and 2m draught can navigate. The limitations result from the dimensions of the locks and the maximum draught loaded of 2m along the whole canal.

Goods transported and transhipped in the inland ports are heterogeneous including all types of general cargo, dry and liquid bulk cargo, containers and heavy cargo. Most of the inland ports offer trimodal services and have sufficient capacity to handle all transport volumes.

Regarding the supply of alternative fuels, at present, no infrastructure is yet available along the Elbe and Vltava. Given that Liquefied Natural Gas (LNG) is considered as the forward-looking alternative fuel in matters of inland waterway transport, future implementation is likely, if there is enough demand from the market side and if economic viability is guaranteed.

Regarding the availability of Traffic Management Systems, the deployment of River Information Services (RIS) is advanced on the OEM inland waterway network. Basic RIS applications have been implemented in both Germany and the Czech Republic.

The OEM Maritime Infrastructure and Motorways of the Sea

The OEM ports include 12 core ports, the key German Ports of Hamburg, Bremerhaven, Wilhelmshaven, Bremen and Rostock, the Port of Burgas in Bulgaria, the Port of Lemesos in Cyprus and the Greek Ports of Piraeus, Heraklion, Thessaloniki, Igoumenitsa and Patras. All the above constitute maritime ports, apart from the Ports of Bremerhaven, Bremen and Hamburg, which also constitute core inland ports according to the Regulation. In addition, all ports have transshipment facilities and related equipment facilitating intermodal transport.

A key requirement of the Regulation No.1315/2013 is a maritime port connection with the road and rail network. The Ports of Igoumenitsa and Patras in Greece, are currently lacking connections to the country's railway network. The latter constitutes a substantial interoperability bottleneck, hindering the seamless intermodal transportation with the use of road/rail and maritime modes along the supply chain of the OEM corridor. These missing rail connections have been taken into consideration by the country, but only the one in Patras is being addressed by a project study. The connection of the Port of Igoumenitsa to the country's rail network has been scheduled. Some studies have already been carried out.

Other interoperability and organisational bottlenecks are created by the lack of Traffic Management System (TMS) deployment in the port of Patras in Greece. The remaining ports are either successfully deploying certain types of Port Community Systems (i.e. German Ports) and Vessel Management Information Systems (Burgas and the Greek ports of Piraeus and Thessaloniki), or plan to deploy these in the near future (Heraklion and Igoumenitsa).

With regard to handling capacity and utilisation, the threshold of annual freight transshipment stipulated by the Regulation is exceeded by all OEM Corridor seaports. Capacity bottlenecks have been identified in Hamburg and Lemesos. These are being addressed by upgrading projects for both ports. Similarly, on-going and/or planned investment projects are expected to increase significantly the handling capacity of several OEM ports (Burgas, Lemesos, Igoumenitsa, Heraklion and Patras).

An additional requirement of the Regulation is the provision of publicly accessible Liquefied Natural Gas (LNG) refuelling points for maritime transport by all maritime core ports until 2030. Such facilities are planned for all German Ports, Piraeus in Greece and Lemesos in Cyprus. The provision of LNG facilities is not included in the plans of the other Greek ports or the Port of Burgas in Bulgaria.

The MoS development is particularly relevant to the OEM seaports in Greece and Cyprus, in order for these to become MoS port nodes along potential viable MoS connections by complying with the MoS quality criteria and the key priorities set for 2014-2020 in terms of maritime integration with ports' hinterland connections and deployment of TMS.

The general conclusion is that bottlenecks are related mainly to their rail hinterland connections (whether existing or missing), not to the ports themselves albeit the capacity on ports infrastructure may become a bottleneck. Nevertheless, they do require modern technologies to improve port performance.

The OEM Road Infrastructure

The road infrastructure covers all the nine OEM countries with a total distance between Wilhelmshaven and Lefkosia of 4682 km on average and a total length of road network

of approximately 5644 km. The majority of the road sections are of Motorways / Express roads class (82%). The main bottlenecks identified along the OEM Road network are those related to non-compliant road classes, namely roads without level-free junctions (mainly single lane). These include small sections in the Czech Republic and Austria; whereas the issue is particularly prominent in Romania, Bulgaria, and to a lesser extent in Greece and Cyprus (Lefkosia south orbital). It should be noted, based on the outcome of the Corridor study that there are several sections, where construction works are under way and part of the identified bottlenecks will be alleviated in the 2014-2015 period.

The average weighted daily number of trucks per OEM corridor road section is about 3,150 and the respective number of cars is 19,000. The most freight traffic intensive sections are located in the German and Hungarian territory. Road sections near urban agglomerations that carry high number of passengers are located in Greece, Germany, Czech Republic and Hungary. The overall average capacity utilisation ratio for the OEM corridor sections, for which data are available, is about 44.5%. As a general characteristic of the entire road corridor, there is a high level of utilisation of the existing road capacity in and around the large cities.

The Regulation No.1315/2013 sets up a list of alternative fuels that substitute (at least partly) the fossil oil sources in the supply of energy to transport. LPG, LNG and CNG are widely available in all OEM countries except Cyprus (where the development is underway), although the density of the stations along the Corridor differs from country to country. Infrastructure systems of publically accessible charging stations and battery swap stations to recharge electric vehicles are generally available in the cities in Germany, Czech Republic, and Austria. In Slovakia, Hungary and Bulgaria the number of stations is low and these are concentrated in one or two urban areas.

The Regulation No.1315/2013 sets also a specific requirement with regard to the provision of sufficient parking areas (at least every 100 km) with an appropriate level of safety. The analysis showed reasonable supply of parking facilities in Germany, Czech Republic, Slovakia, Austria and Hungary. In Romania, Bulgaria and Greece, there are still long road sections without any suitable facility.

The Regulation No.1315/2013 also sets up requirements for interoperability of the electronic toll collections systems. Road user charging systems are in force in all OEM countries but Cyprus, five of which are electronic (in Germany, Czech Republic, Slovakia, Austria and Hungary). These systems meet the requirements of Directive 2010/40/EU on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport. Nevertheless, for the moment, all these systems do not provide for seamless trans-border traffic, with the exception of partial cooperation between Germany and Austria, whereby the heavy goods vehicles only need one in-vehicle unit – the Toll Collect OBU – to pay toll charges in both countries. Crossing the corridor, would mean having 4 different toll OBU's and 3 different stickers on the window.

A priority should be given to implementation of sufficient secure parking areas and the inter-operability of toll collecting systems along the corridor.

The OEM Air Transport Infrastructure

There are 15 core airports along the OEM Corridor (Hamburg, Berlin, Bremen, Hannover, Leipzig/Halle, Praha, Wien (Schwechat), Bratislava, Budapest (Ferenc Liszt International), Timisoara, Sofia, Athens, Thessaloniki, Heraklion, Larnaka). Out of these airports, 6 airports (Hambourg, Berlin, Prague, Vienna, Budapest and Athens) have to be connected to the rail network according to the Regulation; only Bratislava, Prague and Budapest are currently not complying with this requirement.

According to Article 42 of the TEN-T regulation, dedicated Main Airports are to be also connected to the TEN-T road network by 2050. To date, the only airport without a high-ranking road connection is the Timișoara airport.

Concerning availability of alternative clean fuels, currently no fixed storage tank facilities for aviation biofuel are reported to be in use in the OEM airports.

Regarding the availability of alternative clean fuels for airport ground services (e-mobility, hydrogen, CNG, LPG); some airports have recently introduced charging or fuelling stations. Natural gas (CNG) and liquid gas (LPG) are already being used at Hamburg Airport as low-emission fuels, while a Hydrogen Project was introduced earlier. In 2013, a charging station for e-cars and a LPG fuelling station for the operation of 37 natural gas-powered vehicles were introduced in Wien. Similar actions are envisaged to be implemented at airports committed to become ecologically friendly in their operation (e.g. Budapest airport by 2020), however, no specific projects are known to present.

Airports located in high population density areas, should be connected in priority to railway networks to improve mobility.

Summarizing the various information on the multimodal infrastructure of the Orient/East Med Core Network Corridor given above, the following table shows the non-compliance values of the most important technical parameters set out for the TEN-T core network corridors.

Overview of length and percentage of non-compliant sections (2014)

Mode	Parameter	Calculation method	Non-Compliance (absolute)	Non-Compliance (relative)
Rail	Electrification	Length of non-electrified sections	645 km	11%
Rail	Freight trains with 22.5 t axle load at 100 km/h	Length of non-compliant sections	1700 km	29%
Rail	Operational speed	Length of non-compliant sections v _{max} <100 km/h	908 km	15%
Rail	Axle load	Length of non-compliant sections with <22.5 t	910 km	15%
Rail	Train length	Length of non-compliant sections with <740m	2734 km	46%
Rail	Number of tracks ⁴	Length of sections with single track	1616 km	27%
Rail	Signalling systems (ETCS)	Length of sections ETCS not installed/ not operated	5074km/ 5325 km	86%/ 90% ⁵
Rail	Telecommunication system (GSM-R)	Length of sections GSM-R not installed	3002 km	51%
IWW	Draught compliance	Sections with insufficient draught (2.50m)	966 km	59%
IWW	RIS deployment	RIS services not deployed (see 7.2.2.3)	9-10 of 20 RIS elements	45-50%
IWW	Bridge clearance	Sections with insufficient bridge clearance (5.25m)	269 km	16%
IWW	Connection to railway: IWW	Ports lacking of rail network integration	1 of 10 ports (Pardubice)	10%
IWW	Alternative fuels (AF)	Ports lacking of AF supply	10 of 10 ports	100%
Road	Express roads/motorway	Length of ordinary roads without grade separated junctions	1015 km	18%
Road	ITS Deployment	Core Network Urban Nodes lacking ITS deployment	0 of 15 Core Network Urban nodes	0%
Road	Electronic Tolling On-Board Equipment	Compatible national systems	2 of 5 countries ⁶	40%
Road	Safe and Secure Parking	Length of road with safe parking facilities	189 km	3%
Road	Alternative fuels (AF)	Countries lacking AF supply	1 out of 9 countries	11%
Maritime	Maritime TMS Deployment	Seaports lacking of VTMISS, PCS, etc.	4 of 12 Core Network Maritime ports	33%
Maritime	Connection to railway: Maritime	Seaports lacking of rail network integration	2 of 10 Core Network Maritime ports (continental)	20%
Maritime	Alternative fuels (AF)	Seaports lacking AF supply	12 of 12 Core Network Maritime ports	100%
Airport	Connection to railway: Airports	Airports lacking of heavy rail network integration	3 of 6 Core network Major Airports	50%
Airport	Alternative fuels (AF)	Airports lacking AF supply	0 of 15 airports	100%

⁴ Double Track is not a technical requirement set out in the TEN-T Regulation 1315/2013.

⁵ i.e. 86% regarding ETCS installation and 90% regarding ETCS under operation.

⁶ Counted are only the countries, in which such electronic tolling systems exist.

3. Results of the Multimodal transport market study (MTMS)

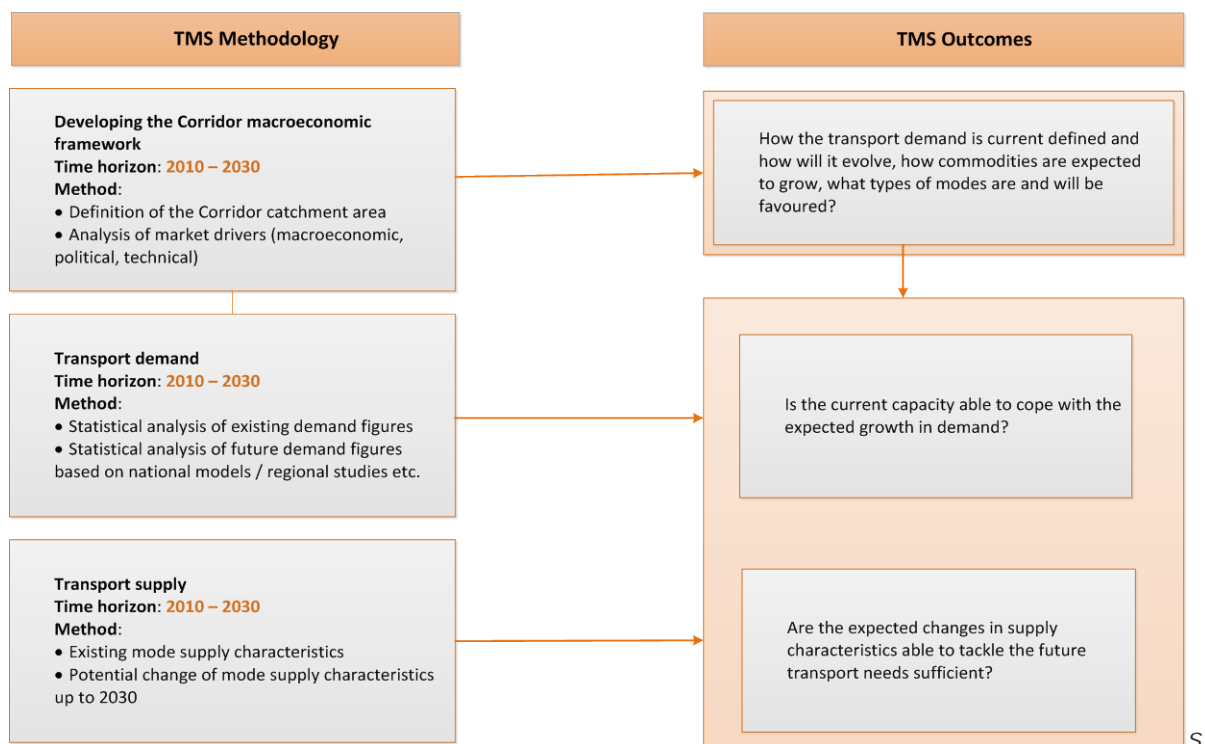
The MTMS describes the transport market characteristics of the OEM corridor in its present condition and in the future. It essentially intends to analyse the OEM Corridor-related transport system and assess the capacity and traffic flows on the respective parts of the infrastructure, covering the time period from 2010 to 2030. The time horizon of 2030 was selected as it represents a major milestone for European policy and at the same time, provides a reliable basis for future results.

The MTMS concept was developed for the present report in order to have a clear integrated view of the process as well as its expected outcomes. Data from national sources such as national forecasting models and regional studies as well as European sources such as the EU Reference scenario and the ETISplus databases has been used.

The MTMS provides information on the macroeconomic framework as well as the Corridor-related demand flows creating the basis for the MTMS.

The Transport Market Study Methodology.

Figure 1: Scheme of the Transport Market Study Methodology



Source: Consortium

The following three key activities were carried out.

Step 1: Analysis of the Macroeconomic framework of the OEM corridor for the period 2010 – 2030.

- Definition of the catchment area. The NUTS 2 regions that are crossed by any infrastructure of the OEM corridor were selected for further analysis for the purpose of the transport market study.

- Analysis of the market drivers. This analysis describes a number of socio economic characteristics of the OEM corridor countries and OEM regions, in particular Gross Domestic Product (GDP), population and urbanisation. Also, a preliminary forecast for the GDP and population was given on the basis of an EU encompassing study. Besides the source Eurostat, national figures on GDP and population were presented.

Step 2: Analysis of the transport demand for the period 2010 – 2030.

- On the basis of national sources the analysis of the current volumes and future demand scenarios developed by national models for each of the Corridor countries are presented. These scenarios describe the prospect of transport demand for a certain time horizon (e.g. 2030) based on a set of macroeconomic and policy assumptions. This analysis has been carried out for each country in the OEM corridor.
- Transport description of the OEM corridor in 2010 covering both the passenger and freight transport using the ETISbase as source. It can be stated that ETISbase covers comprehensive data for passenger and freight that is derived from Eurostat and national sources. This analysis describes the transport for the catchment area on the corridor, i.e. on the first level, with origins and destinations inside the catchment area.
- Integrated freight transport demand scenarios. In this analysis the second level (origin and destination in the corridor) and third level (transit) of corridor traffic for rail and road transport has been considered. For both road and rail freight transport the base year 2010 is presented and the forecast for the year 2030. These forecasts are based on the available PP22 study. In this PP22 study the European reference scenario as presented in the socio economic section is used. Also for inland waterways and maritime transport the forecasts are presented for 2030, based on 2010. These forecasts are, just as for rail and road, based on the European reference scenario. The advantage of this approach is that all countries are treated in a comparable way with all of them a similar base year 2010.
- Integrated passenger transport demand scenarios. In this analysis the long distance passenger rail transport in million passenger kilometres in 2010 and 2030 on the OEM corridor has been considered.

Step 3: Analysis of transport supply.

On the basis of the review in which key bottlenecks and critical issues in the infrastructure were identified, an outlook to the future (2030) is presented for rail and inland waterway. This outlook is based on the forecasts for the demand side and the identified bottlenecks and critical issues. Where possible future projects were assessed for their impact on the elimination of these bottlenecks.

The outcomes of the above three activities led to the following results.

Gross Domestic Product (GDP) and population

For population forecasts there are mixed results, since a decline is expected for 4 Member States.

The development of GDP in the period 2010 – 2030 shows that for all countries in the OEM corridor a positive growth is expected.

The national transport volumes and demand scenarios

National forecasts and national transport figures are available through the project sources, as well as official national sources from the corridor countries. One of the main conclusions is that forecasts, if available, are on a regional level within the country considered (for example Austria, Germany, Bulgaria), but lack the regional detail in other countries. At best a differentiation is obtained between domestic, import/export and transit traffic. This means that on the basis of this information, the OEM corridor cannot be isolated from other corridors and any further analysis cannot be made at this stage.

Also, one may consider that there is no uniform scenario used in case of forecasts being available. At best, the scenarios of the German "Bundesverkehrswegeplan" are taken into account in the Austrian "Verkehrsprognose Österreich 2025+". Nevertheless, the timing is different; the Austrian plan is developed in 2009. The German plans originate in 2007 and 2010 respectively⁷ and will be updated in 2015. For a number of countries, forecasts are either not available or are given in qualitative figures. This limits the scope of the potential for an overall in-depth analysis.

Transport description of the OEM corridor in 2010

The first level of corridor traffic, that is, transport within the Corridor catchment area, has been described for the base year 2010. For freight transport, the domestic transport has been included. Notably for road transport the domestic transport is carried out on short distances. This is one of the reasons why the volumes for road are relatively high. The short distance transport by road is explained by a high share of building materials, foodstuffs, agricultural products and final products.

This also concerns the last- or first mile transport related to long distance transport by rail or inland waterways, for example container transport. In the description and analysis the short distance transport has been separated from long distance transport. On the longer distance there is more competition between road versus rail and inland waterways.

Integrated freight transport demand scenarios

The second level (origin and destination in the corridor) and the third level (transit) of corridor traffic for rail and road transport have been considered, in both, tonnes and tonne-kilometres.. For rail, the first level traffic is subdivided in domestic and international traffic, and the second level in imports and exports. For road, the first level domestic traffic has been further split into domestic short distance and domestic long distance. The short distance transport is in general applicable for distances shorter than 80 kilometres.

Also for inland waterways and maritime transport, forecasts for 2030 have been presented for land-land flows in the OEM corridor. For inland waterways, in total a growth of 25% is expected in the period 2010-2030, and for maritime transport of 14%.

⁷ Revision of Transport Infrastructure Demand Plan (Überprüfung Bedarfsplan 2010) and Traffic Interconnection Forecast 2025 (Verkehrsverflechtungsprognose für 2025), issued in 2007.

In the table below the results for the forecasts are summarized.

Table 2: Freight transport volume between the OEM regions for 2010, 2030 reference scenario; in 1,000 tonnes

	2010	2030 reference
Road	415,483	746,158
Rail	189,711	379,966
Inland waterway	18,694	23,361
Maritime	74,995	85,578
Total	698,884	1,235,063
Rail share	27.1%	30.8%
IWW share	2.7%	1.9%

In the European reference scenario, the share for rail is expected to grow from 27.1% in 2010 to 30.8% in 2030, whilst the share of inland waterways is expected to decrease from 2.7% in 2010 to 1.9% in 2030. In view of the decrease for inland waterway transport in the reference scenario, particular attention needs to be given to support this mode of transport. These percentages increases are relative and represent the share of the global volume increasingly transported. If full compliance with TEN-T standards is achieved by 2030, the share of rail and inland waterways may be expected to increase.

Integrated passenger transport demand scenarios

The passenger demand for the period of 2010 to 2030 remains almost stable with a growth rate of 0.05% per year.

Most of the countries demonstrate slightly positive growth rates with the exception of the Czech Republic and Hungary. These two countries have negative growth rates of 0.58% and 0.39% annually.

Analysis of transport supply

For rail and inland waterway, the identified bottlenecks and critical issues have been analysed using the forecast of the demand side. Where possible, future projects were assessed for their impact on the elimination of these bottlenecks.

For rail, the most important following bottlenecks were identified. (Because of uncertainties e.g. no data for short distance passenger traffic, in the identification process some of the bottlenecks are mentioned in terms of probability).

- The section Dresden – Czech border. Mainly because of growth in freight transport there is high probability that this section will be a bottleneck in 2030;
- The Hinterland traffic from/to Hamburg and according to German Rail (DB NETZ AG) also the Hinterland traffic from/to Wilhelmshaven and Bremerhaven/Bremen are expected to be bottlenecks;
- The Praha – Česká Třebová line is at full capacity in the base year, and for the year 2030, a doubling of the freight transport is expected, which confirms that this section is really a bottleneck;

- For the rail sections to/from Budapest, a doubling of freight transport is expected. According to the Hungarian railways the improvements that will be made, will be sufficient;
- The cross-border section Békéscsaba – Thessaloniki. This section is rather long (1.168 km, or about 20% of the total OEM Corridor length) and runs on the territories of Hungary, Romania, Bulgaria and Greece. Currently the characteristics of the railway lines are rather heterogeneous and many sections do not meet the requirements set by the Regulation No.1315/2013. According to the reference scenario for this section, growths for subsections are expected in 2030 between 70% and 160%. The biggest growth is expected for the section Filiași – Arad in Romania. For the subsections in Bulgaria and Greece, a more modest growth (70%) is forecasted.

For inland waterways the following locks were identified as possible bottlenecks:

Shiplift Lüneburg. The replacement of the shiplift by a lock with greater dimensions is under consideration.

Apart from expected demand there are other factors that influence the future availability of capacity on rail or inland waterway infrastructure.

- Infrastructure charges in rail freight transport. Access charges have to be paid to access the rail networks;
- Average border waiting times in rail freight transport. The users of rail freight services are still confronted with considerable waiting times at various border crossing points along the corridor;
- The issue of capacity on mixed traffic lines and practices to resolve conflicts between trains is a subject for extensive research and development. This concerns the implementation of ERTMS level 3, introducing a system of gradual timetabling and computer assisted train operation systems that are targeted in a long term future to be realised well beyond 2020.

For inland waterways these other factors are:

- The deployment of River Information Services (RIS). In both Germany and the Czech Republic, basic RIS applications have been implemented. The RIS could lead to a reduction waiting times before locks, bridges and ports.
At present no infrastructure for the supply with alternative fuels is available along the Elbe and Vltava. In general, Liquefied Natural Gas (LNG) is considered as the forward-looking alternative fuel in matters of inland waterway transport. The planning for the construction of supply infrastructure for LNG takes place along the Unterelbe, and more specifically, in the Port of Hamburg.

4. Critical issues on the *Orient East Med Corridor*

The key critical issues are identified by the study review, infrastructure compliance analysis and Transport Market Study and constitute rail cross-border and capacity issues, horizontal issues in terms of interoperability and intermodality, IWW bottlenecks and, finally, seaports integration into the Corridor. The critical issues largely coincide with the objectives of the CEF pre-identified projects provided in Annex I of the Regulation.

River Elbe

The River Elbe is characterised in general by insufficient navigability conditions, as well as deficiencies of several sections along its length, in terms of unreliable draught conditions, incomplete network, limited underpass clearances, non-compliant lock chambers, capacity deficiencies, etc. Due to the involvement of two Member States, Germany and the Czech Republic, this also constitutes a cross-border border issue.

Rail cross-border and capacity

The overview of the OEM railway corridor identified three critical cross-border sections. The existing **Dresden – Praha** rail line (DE-CZ) is already highly used, while the forecasted considerable growth in freight demand might create a critical capacity bottleneck for this section. A clearer picture might be given by the results of the examination in the frame of the finalisation of the German Federal Transport Plan (BVWP) by end 2015 , and by potential other studies results.

The **Brno – Győr** (CZ-AT/SK-HU) line exhibits technical bottlenecks at border crossing points characterized by poor technical condition of railway border bridges near Břeclav and towards AT and SK borders. The railway node Brno is also considered an important bottleneck in the Czech Republic, showing considerable capacity deficits and poor condition regarding basic technical parameters. In the Bratislava area, capacity bottlenecks are evident at the Devínska Nová Ves station and all other relevant Bratislava stations including tunnels.

Finally, there are interoperability issues along the long section **Békéscsaba – Thessaloniki (HU-RO-BG-EL)**, which also exhibits rather heterogeneous technical characteristics, while many sections do not meet the requirements set by the Regulation.

Apart from the above, the capacity utilisation analysis in conjunction with the results of the MTMS identified potential critical capacity bottlenecks at the hinterland transport to/from the Port of Hamburg, along the Praha – Česká Třebová line and along the rail sections to/from Budapest.

Maritime Ports

Intermodality constitutes a key critical issue for ports in terms of providing the necessary connections to the land networks to ensure the seamless intermodal transport along the supply chain of the OEM corridor. The latter is particularly relevant in the case of the Greek ports of Igoumenitsa and Patras, which are currently lacking connections to the rail network. Another critical issue is interoperability in terms of deployment of e-maritime services and vessel traffic management systems, which are either existing or planned in all OEM seaports except from that of Patras in Greece. Another critical issue is interoperability in terms of deployment of e-maritime services and vessel traffic management systems, which are either existing or planned in all OEM seaports except from that of Patras in Greece. In Cyprus, this regards also the need for improved road connections to seaports and port infrastructure capacity.

Intermodality

Apart from ports, the issue of intermodality must also be addressed in both rail-road terminals and airports. The present situation could be characterized in general by bottlenecks or missing links between airports and corridor infrastructure, as well as the need for improvements in the connections of IWW ports and Rail-road terminals.

Operational rules, ERTMS, Traffic Management Systems

One critical issue regarding operational rules refers to organizational bottlenecks, as well as lack of ERTMS and other Traffic Management systems deployment in the road and seaport/IWW network.

The identified planned projects (Infrastructure and studies)

The OEM Corridor study, provides an extensive list of all on-going and by 2030 planned projects (infrastructure works and studies) known to present (2014), as obtained by National Ministries, the Infrastructure Managers and Regional Authorities. The projects were classified primarily under five key categories reflecting the key objectives of the Corridor, namely technical compliance, intermodality, interoperability, capacity and sustainability, while a secondary classification was provided to account for critical issues, cross-border issues and urban areas location. In total, 280 projects are listed for all modes, out of which:

- 101 address technical compliance bottlenecks
- 39 address interoperability issues
- 38 address intermodality issues
- 90 address capacity issues
- 12 address sustainability issues

The analysis of the 280 listed projects leads to observe that:

- 142 of 280 projects are addressing the (partial) mitigation of critical issues.
- The global estimation for the costs of the 280 projects is around 47,4 billion €.
- Approx. 25,6 billion € must be spent as project costs on critical issues in the OEM corridor, as far as costs are known at all.
- Approx. 15,8 billion € of these costs for critical issues are still to be financed.

Rail & RRTs

The investment projects for Rail and Rail-Road Terminals are expected to address the majority of existing bottlenecks in the OEM rail network by 2020. Nevertheless, there are still certain critical ones that will not be alleviated before 2020, particularly with regard to the technical non-compliance of certain sections in Bulgaria, Czech Republic and Romania. The undefined timing for a large number of projects is also deemed problematic, as it would hinder an implementation in the short-term.

IWW

In the Czech Republic, mitigation measures have been identified to alleviate the main bottleneck of the non-compliance of River Elbe. However, planning of projects and progress towards compliance with TEN-T requirements will require a close follow-up. In Germany, the mitigation measures are not defined yet and are expected as a result or follow-up of the German study "Gesamtkonzept Elbe". Also the implementation timing of various projects is still unspecified. A jointly coordinated schedule is expected with the German study "Gesamtkonzept Elbe". "Additional open issues are the unspecified timing and projects for the deployment of alternative fuels in all inland ports". In Germany, the RIS directive has been legally transposed and obligatory technical requirements have been implemented.

Seaports

The investment projects are expected to address the majority of existing intermodality, interoperability and capacity bottlenecks in the OEM seaports by 2020. Nevertheless, there are still certain critical ones that will not be alleviated before 2020, such as the missing rail connections to the Greek ports of Igoumenitsa and Patras, the deployment of TMS at the Port of Patras, as well as the provision of alternative fuels missing from the Port of Burgas and all Greek ports apart from Piraeus.

Road

Most road projects entail the construction of new or upgrading of existing motorway sections, which are expected upon completion to increase the relative share of motorway/express road sections to 92% of the total Corridor length. In addition, 80% of the projects planned to be completed after 2020 will address capacity problems in urban areas. Other related projects will only partially contribute to achieving interoperability of ITS and tolling systems along the Corridor, while there are very few projects aiming at introducing or extending the supply of alternative fuels and improving the efficiency of energy use.

Airports

Connection of main airports with rail network is fundamental to achieve multimodality and interoperability objectives set by the European commission. 33% (2 out of 6) of the Core network major airports, belonging to the Orient-East Med Corridor, are currently not connected with heavy rail. Accordingly for the corridor airports, the "open issue" is: The progress to provide capacity for alternative fuels for aircrafts shall be monitored in all corridor airports, as no project is in place yet.

Railway interoperability

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.

The Work Plan of the European ERTMS Coordinator describes in details the proposed way how to accelerate ERTMS equipment along the Core Network Corridors. In cooperation with the railway sector, a so called Breakthrough programme for ERTMS has been established that consists of a limited number of objectives to be reached by 2016. One of those objectives is the review of the currently valid European Deployment Plan (EDP) and to identify a strategy for ERTMS equipment by 2030, as laid down in Regulation (EU) 1315/2013 .

The ERTMS deployment along the Orient/East Med

Detailed ways how to accelerate ERTMS equipment along the core network corridors will be described in a separate Work Plan by the European ERTMS Coordinator.

The Orient/East Med corridor is partly coinciding with the ERTMS corridors E and F (and shorter parts of D and B), and also with sections where ERTMS deployment is required by the European ERTMS Deployment Plan 2009 (EDP) and sections of additional voluntary national development.

According to EDP and Decision 2012/88/EU, the deployment target by 2015 is to have approximately 1.872 km (32% of rail network length) fully equipped with ERTMS (ETCS plus GSM-R), which comprises major sections of the northern part of the corridor (DE, CZ, SK, AT, HU, partly RO).

Until 2020, an additional 2.279 km (39% of corridor) needs to be deployed with any ETCS subsystem. 480 km (8%) is not part of any recent deployment plan (mainly port links in DE and EL).

As regards the current status of ERTMS deployment, ETCS L1/L2 has been installed along certain railway sections in Austria, Hungary, Bulgaria and Greece (14% of length), while less are under operation.

GSM-R is in operation in Germany, the Czech Republic, in Austria and parts of Bulgaria and Greece (49% of length). Additional parts of the corridor are currently under construction. Other sections do not have a clear deployment date.

According to the list of identified projects along the Orient/East Med corridor, 52 projects and measures directly or indirectly related to ERTMS deployment have been identified, covering roughly the half of the OEM corridor railway lines.

However, the majority of the ERTMS projects are still in the planning phase; their finalisation is expected for 2020 or later and, thus, notably later than the requirements of Decision 2012/88/EU. For some of the corridor sections no year of completion has been defined the present; partially, the implementation of ERTMS is coupled to the regular displacement of legacy train control systems.

In many cases, it can be assumed that the overall upgrade or new construction of railway lines, especially those of the High-speed network, includes the ERTMS deployment as requested in the Decision. Therefore, the full ERTMS deployment could also be expected by the Corridor implementation target year (2030).

Nearly all ERTMS projects in the northern part (DE, CZ, AT, HU) refer to the implementation of ETCS level 2, as GSM-R is already in operation or under construction, while the southern part (RO, BG, EL) deploys Level 1. In Germany and Austria, studies about the upgrade of the currently employed level 1 on testing lines are ongoing.

The severe deployment delays in most of the Member States have been pointed out in the EC document of February 2014: For Corridor E (Dresden – Constanta), the delays varied among Member States from 0 to 5 years, for corridor F Germany had announced the finalization date of 2027.

The coherence analysis at cross-border points shows that recently none of the cross-border points show a fully operating ERTMS system on both sides of the border. GSM-R is operated on both sides of DE/CZ and CZ/AT and SK/HU border. Where installed (AT/HU, RO/BG), ETCS is not under operation yet. In the near future, on 5 out of 8 border crossing points, deployment time gaps of 2 to 10 years might occur, according to recent schedules.

The RIS Deployment Plan

Germany has implemented a wide range of RIS applications (ELWIS system), which in general are of high quality. In the Czech Republic, basic RIS applications have been implemented (LAVDIS system), but LAVDIS services such as provision of Notices to skippers suffer from the lack of reliability of their operation. Operational improvements are needed.

In both countries, a barrier for RIS development is the funding. The progress with the implementation of a few applications or its roll-out to the complete waterway network will be delayed, as cost-benefit evaluations of certain applications regarding data collection, storage and use were considered and personnel resources are limited at the national IWW administrations responsible for RIS implementation.

Apart from RIS, other IWW related investments are required, which are regarded as more important. In addition, the vessel fleet operated at the Elbe have outdated equipment and low transport performances, which reduces potential RIS benefits.

While basic systems are almost fully in place (Notices to Skippers, Electronic Nautical Charts), but not completely operational, the deployment of a majority of advanced RIS services is still on-going.

The international data exchange between the two riparian countries is planned but still hampered by different technological applications and legal problems, especially because of data privacy issues. The missing interconnection between Czech Republic and Germany is regarded as a barrier for the wider use of electronic reporting.

Another challenge is the RIS implementation in inland ports. A number of inland ports have still not set out the necessary steps for the RIS implementation. No specific information is available for the Orient/East Med Corridor core network ports in Germany (Hamburg, Bremerhaven, Bremen, Hannover, Braunschweig and Magdeburg). Finally, no further RIS development plans are known for the Czech core network ports (Děčín, Mělník, and Praha).

Other Elements (Resilience, Environmental Issues)

The practice established by the EC of continuously sharing with the Member States the state of project progress has proven to be very effective and thus should be maintained in the future. Furthermore the various projects presented by the Member States could be accompanied by traffic forecasts, CBA, accompanying measures necessary to meet the traffic targets and alternative solutions to the proposed projects.

The definition of the investments required should take in proper consideration the freight-oriented nature of the Corridor.

In addition to the above elements, mitigation and adaptation measures should be taken in advance by Member States and local agencies to reduce impacts of climate change and extreme weather events in the long-term since these may negatively affect transportation systems increasing the risk of damages, delays and failures on roadways, railways, air and marine transport infrastructures.

5. Objectives of the *Orient East Med Corridor*

In accordance with the TEN-T Regulation No.1315/2013, the OEM Corridor shall demonstrate European added value by contributing to the four key objectives related to territorial and structural cohesion, efficiency between networks/modes sustainability and increased benefits for users. The Regulation's objectives together with the related goals set in the 2011 White Paper for Transport - Roadmap to a Single European Transport Area – towards a competitive and resource efficient transport system are used to define the corridor-specific objectives. A benchmarking methodology is also proposed in the overall study in order to measure the corridor performance against the set objectives.

The methodology is based on the definition of a number of related Key Performance Indicators (KPIs) per strategic objective (SO), for the measurement of which data is readily available.

6. Recommendations and outlook by the European Coordinator

The analysis of the corridor has shown that the corridor faces multiple challenges. This is particularly true as transport on the corridor should evolve towards environmentally friendly modes of transport (rail and inland waterways).

In the northern part of the corridor, one of the key issues is congestion which may hamper the efficiency of transport operations. In the southern part, one of the key issues is the lack of (interoperable) infrastructure which would basically allow for efficient transport operations. The corridor development needs also to take into account the developments outside the EU like the tunnel under the Bosphorus which could give an impetus to the use of railways or the cooperation with the Western Balkans.

Critical issues on the corridor are estimated at approximately 25 billion €. Knowing that available CEF funding for all corridors is limited currently to 26,2 billion€, respect of priorities improving the corridor efficiency is essential. In all cases, strong coordination between the Member States involved, but also between the different transport modes is crucial to guarantee that maximum benefits are achieved from the investments done.

a) Continuity of the Corridor alignment:

The added value of the corridor will depend inter alia on its "continuity" and its "interoperability" between and across different modes of transport technical standards

b) Priority to Inland navigation, railways and crossing-borders improved practices:

On the basis of the state of play and recent evolution of transport infrastructures, Inland navigation and railway transport are, comparing with other modes of transport (mainly transport by roads), increasingly suffering of passenger and freight flows discontinuities. Therefore, priority should be given to these modes and more particularly to the unefficient or non-existing cross-border sections.

A common corridor methodology should address those cross-border challenges, including for other corridors, without prejudice for existing particularities of specific cross-border sections.

c) Coordination of the transport development plans:

The nine national transport and mobility plans of the countries concerned by the OEM corridor, including the by the European Commission requested "Transport Master plans", should in particular make provisions for the needed investments on the corridors.

The use of structural funds should be oriented towards the logic of the transport core and comprehensive network development aiming at an efficient comodality approach.

d) Maintain a multimodal transport network:

In view of the evolving demand for mobility in highly populated and intens economic development areas it is important to maintain and promote multimodal transport infrastructures for people and goods. The current and future congestion of the road networks, as well as the decarbonisation policy of transport and an efficiency in-line with

the expectations of the users are main drivers for the promotion of the use of railways and inland navigation.

Abandoning existing rail or inland waterways infrastructure could compromise the added value of the European Corridors approach for countries and regions concerned.

e) Projects evaluation:

The evaluation of projects by the European Commission and the EIB, must be based on socio-economic criteria including financial returns on investments, but also on the impacts on employment rates, the environment, congestion problems, increase of the regional GDP etc. Further in-depth analysis of the impact of these criteria should be encouraged.

f) Operational and administrative bottlenecks:

Special attention should be paid to all types of bottlenecks which may sap efficiency of investments by hindering transport speed and efficiency. A specific study of the administrative bottlenecks on the borders and along the corridor should be part of the priorities and methodology of the management of cross-border projects. An analysis of transport time lost due to administrative burden has to be compared with the costs of some infrastructure investments.

g) Links to third countries:

The important need for an efficient and fast action to improve the functioning of the corridor should include the links with third countries like Turkey and the Western Balkans. Our attention should also go after the adoption of the work plan to a better understanding and analysis of the needs to connect the OEM corridor. One should explore possibilities in the frame of the MoS projects.

h) Communication and promotion:

It is important to inform and involve a maximum of stakeholders and citizens about the objectives and projects on the corridor. A partnership with the European Parliament and with concerned MEP's, the Regions and municipalities but also with operators, infrastructure managers and specific organisations would be the basis for an efficient information system and for a smooth acceptance and support principle. This will be an important task for me over the years 2015 and 2016.

When analysing the situation of the OEM corridor from the north to the south of its location through Europe, I came to the following main conclusions about the priority areas where most efforts should be dedicated under the CEF and the ESI funds financial support.

Cross-border and main bottlenecks issues on the corridor alignment are of major importance and should receive sufficient support for their implementation.

As foreseen by the TEN-T Regulation, I would propose to setup the following working groups:

1. on cross-border issues,
2. on regional cooperation,
3. on railway transport and infrastructure investments coordination between Hungary, Romania, Bulgaria and Greece

My recommendations by mode are the following:

1. Railway network improvements:

- a. The northern entry doors of the corridor are subject to heavy congestion when it comes to an efficient management of the entry/exit flows of the maritime/inland ports. If there is a need to upgrade the railway infrastructure capacity and quality of the port of Bremerhaven allowing a better connection to its hinterland should be evaluated in the German Bundesverkehrswegeplan 2015. This could also have positive impacts on the transit of goods via the city of Bremen.
- b. The railway line situation between Dresden and Prague is highly used and could be saturated in future years according to assumptions of some studies. A new project could be an option to improve operations of both passengers and freight lines and might allow for a smoother interconnection between Germany and the Czech Republic. The construction of a new high speed line and the upgrade of the existing line have to be considered.
- c. The upgrade of the Brno – Breclav railway link as a high speed line will also increase the needed transport capacity between the Czech Republic, Austria and Slovakia on its continuation from Dresden.
- d. The Budapest node is expected to become a significant bottleneck for the hinterland transport to/from the northern German ports along the Praha – Ceska Trebova line and along the rail section to/from Budapest. The planned track improvement is recommended.
- e. The capacity issues on the line Praha – Ceska - Trebova have to be considered
- f. The lack of second track between Hungary and Romania may become an important bottleneck. The track improvement is recommended.
- g. The rehabilitation at TEN-T standards of the Craiova – Calafat link in Romania to connect with the Bulgarian border is necessary. The connecting link from the Romanian/Bulgarian border to Sofia via Vidin, Medkovets and Ruska Byala should be speeded-up.
- h. The Bulgarian railway section leading to Greece via Radomir and Kulata needs modernisation as well as its cross border link between Kulata (BU) and Promachonas (GR).
- i. The new construction in Greece of the double Track high speed railway between Tithorea and Domokos, connecting the port of Igoumenitsa with Athens, as well as the finalisation of the upgrade missing links between

Athens and Patras via Kiato and Rio via Rododafni are part of the completion of the southern access door to the corridor via the Greek ports.

- j. ERTMS deployment is at advanced stage in the middle of the axis, but in the German and Bulgarian/Romanian part it is lagging behind. Detailed ways how to accelerate ERTMS equipment along the core network corridors will be described in a separate Work Plan by the European ERTMS Coordinator. Greece has been heavily investing in its section for many years and might be able to complete it by 2017.

The "Vienna hub" is the frontrunner and will most probably finalise the deployment by 2017 that will significantly contribute to the development of this area.

Germany should focus in priority on the connection to the Czech Republic starting with the cross-border section till Dresden by 2020.

Concerning the Eastern branch of the Corridor: Romania should first contact and agree with Hungary in the common cross-border section, and Bulgaria and Greece shall seek for cooperation. The remaining sections shall be finalised as third step.

This cross-border cooperation should involve at the same time Ministries, Infrastructure Managers and National Safety Authorities.

2. Maritime ports improvements:

- a. The northern German ports should persevere in the implementation of alternative fuels and ITS technology.
- b. The Greek port of Heraklion must increase their efficiency by implementing VTMS and port community communication state of the art infrastructure.
- c. The intermodal efficiency of the Greek ports of Thessaloniki and Patras needs a modern and efficient rail connection to the OEM core network corridor.
- d. The port of Igoumenitsa needs to terminate and complete its rail connection and maritime infrastructure improvements (e.g. new quay walls, new terminal building..)
- e. The Cypriot port of Lemesos terminals 1 and 2 would greatly benefit from expanding its cargo storage capacity, the extension of its south container quay and the construction of a new passenger terminal. The use of financial instruments should be explored to finance parts of it.
- f. Greek ports and their links with Crete and Cyprus need to implement MoS standards to improve maritime transports which are the main transport connection between the continent and the islands.

3. Inland waterways improvements:

- a. Inland waterways are key elements to ensure an essential and effective hinterland connection from the northern ports of the corridor to central European countries.
- b. The main efforts in this field are to be oriented to an improved navigability of the Elbe River in conjunction with the environmental aspects.
- c. The Ober and Middle Elbe areas as well as the State border part between Germany and the Czech Republic need an in depth analysis and

construction planning to give an economical impetus to a respectful use of the Elbe river capacities. The "Gesamtkonzept Elbe" is a key element to reach this objective.

- d. The Czech Elbe part between Usti nad Labem – Melnik and Pardubice needs additional studies and infrastructure works to increase capacity and performance like e.g. the locks of Decin Weir lock complex, the Smojedy, Prelouc, Velky Osek and Brandys nad Labem lock chamber modernisation.
- e. It is obvious that developments in both countries need the continuation of the existing regular dialog between the two countries to approach a waterway without bottleneck.

4. Airports intermodality improvements:

Priority should be given for the development of heavy rail connection to the airports rail nodes of Budapest, Bratislava and Praha Vaclav Havel.

In Cyprus, the construction of an Interurban multimodal near to the Airport of Larnaka may be a good candidate for the use of financial instruments or PPP.

5. Roads projects improvements:

The road junction near to the border between Hungary and Slovakia on the M15/M1 needs upgrading between Rajka and Hegyeshalom.

The express road R52 between the Czech Republic and Austria needs upgrading.

The Cypriot Lefkosia South Orbital ring Motorway and the bottlenecks on the Lemesos-Lefkosia Motorway needs additional infrastructure.

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Corridor website:

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

Annexes and useful links

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

- Corridor Study
- List of projects
- TENtec maps



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