



# **CID Book 5 - Implementation Plan**

**2019 timetable year**

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## 1. Introduction

### 1.1. Legal background

The Commission of the European Union proposed in 2008 the creation of a European rail network for competitive freight, consisting of international corridors. The aim is to achieve reliable and good quality railway freight services to be able to compete with other modes of transport.

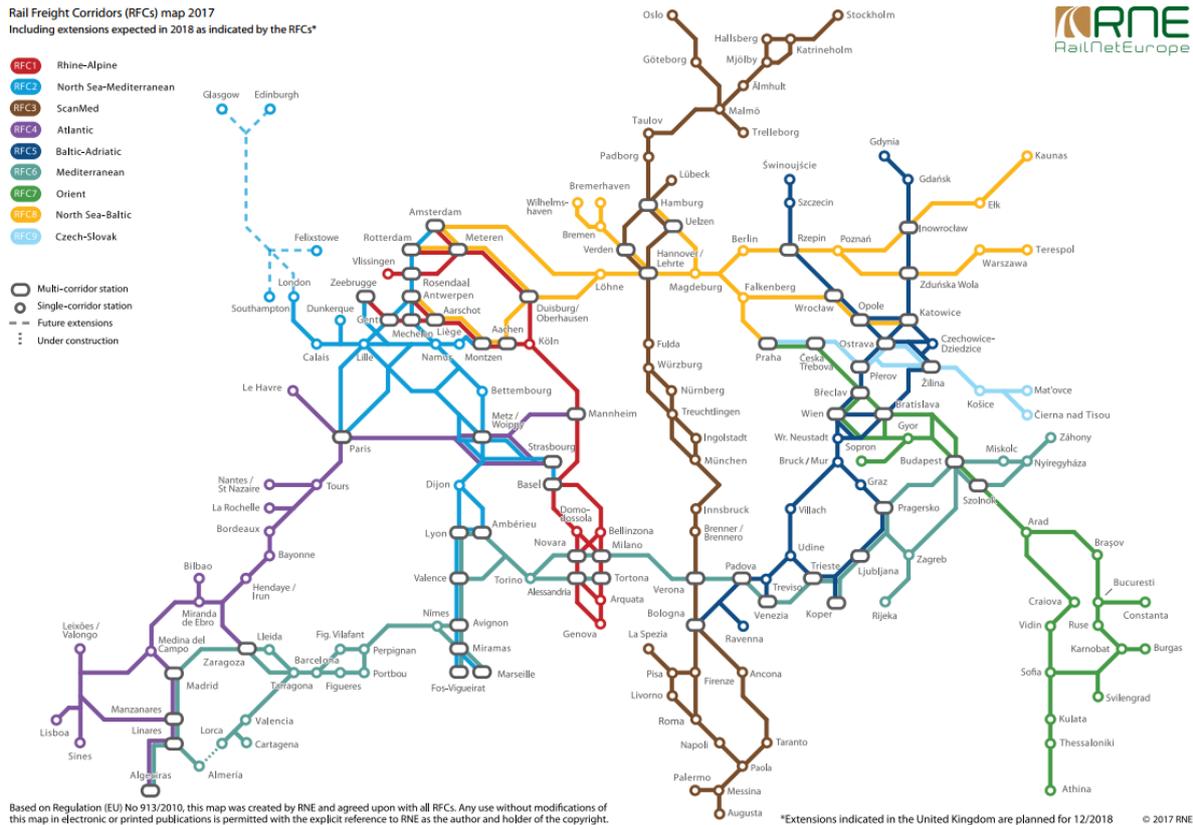
The rail transport for goods has been experiencing difficulties in Europe for more than thirty years for a number of reasons: changes in industry, the development of motorways, and new logistic requirements on the part of companies. In order to respond to these difficulties, the Community has launched an active transport policy for the revitalisation of rail transport based on progressively opening up transport services to competition (effective for all freight since 1 January 2007) and developing the interoperability of rail systems.

The Commission's objective to initiate Regulation (EU) 913/2010 of 22 September 2010 concerning a European rail network for competitive freight (hereinafter: Regulation) was to improve the service provided by the infrastructure managers to international freight operators. It was published in the Official Journal of the European Union on 20 October 2010 and entered into force on 9 November 2010.

Through the Regulation the Commission would like to act in the following main areas corresponding to the process of harmonization:

- improving coordination between Infrastructure Managers;
- improving the conditions of access to infrastructure;
- guaranteeing freight trains adequate priority;
- and improving inter-modality along the corridors.

The purpose of the Regulation is to create a competitive European rail network composed of international freight corridors with a high level of performance. It addresses topics such as governance, investment planning, capacity allocation, traffic management and quality of service and introduces the concept of corridor one-stop shop. According to the Annex of the Regulation, nine corridors were defined. The schematic overview of the Corridor network is displayed below.



**Table 1**

The Corridors commit to fulfil their intended role of increasing international rail freight’s competitiveness, unlocking the huge growth potential for longer distance freight and promoting rail’s key role in a sustainable transport system. The improved marketability of the corridors is key to maintaining and winning over end-customers to the rail solution.

The Regulation requires a governance structure on two levels: an Executive Board (composed of representatives of the authorities of the Member States) and a Management Board (composed of representatives of the Infrastructure Managers (IMs) and Allocation Bodies (ABs)). It also requires the creation of two Advisory Groups (AGs): one consisting of representatives of terminal owners and managers, the other consisting of representatives of Railway Undertakings (RUs).

The corridors shall further designate or set-up a corridor one-stop shop (C-OSS) for allocating certain types of international freight capacity (pre-arranged paths (PaPs) and reserve capacity (RC)) on the Corridor.

A Corridor is a complex project that follows a new set of rules and procedures. For this reason, the Corridor Information Document (CID) was created to guide all clients and interested parties through the working of the Corridor. Together with RailNetEurope, the Corridors have harmonised the structure and most of the texts to allow an easier access to and understanding of this information.

## 1.2. Aim of the Implementation Plan

The purpose of this document is to create an inventory of the numerous tasks that derive from the establishment and the operation of Orient/East-Med Corridor. Seeing that the Regulation allotted a very limited time period for IMs to create the rail freight corridors, it was

necessary to concentrate on the essential steps that need to be taken. In the past few years the member companies of the Management Board tried to define the conditions of operation of the corridor by systematically listing the tasks, analysing the possible procedures, and choosing the most feasible solutions for every single field of activity.

This document summarizes the conclusions reached, and contains the commonly accepted rules applicable along the corridor.

It also serves as a management tool for the MB, a basic document that shall be regularly updated with newly defined solutions, so it will become a point of reference that can continuously support the work of involved companies.

The Implementation Plan aims to present to the Executive Board and to the European Commission the main characteristics of the corridor, the measures taken so far and the planned procedures of corridor operation.

The Implementation Plan is also to be published on the website of RFC OEM, in order to ensure transparency, encourage networking with other corridors and to attract the interest of the potential business partners.

### **1.3. Aim of RFC OEM Members**

The railway infrastructure managers and capacity allocation company are responsible for establishing and running RFC OEM and are committed

- to develop a railway corridor in harmony with freight market demand,
- to offer reliable, high-quality, competitive transport services in order to increase this market demand,
- to operate the infrastructure cost-effectively on the long run through harmonization of technical and procedural conditions,
- to build on the opinion of business partners to attain their satisfaction,
- to be a worthy part of the European railway network by becoming an essential connection between Central Europe and South-East Europe, and form a link to Asia through the Black Sea and Aegean Sea ports,
- to contribute to increasing the market share of the environmentally most friendly land transport mode, and thereby
- to facilitate the environmentally sustainable development of the European economy and the achievement of a better quality of life for its people.

## 2. Corridor Description

### 2.1. Corridor routes

According to Regulation (EU) 1316/2013 which is amending the Regulation (EU) 913/2010 the RFC 7 is extended to Germany and renamed to Rail Freight Corridor Orient / East-Med (OEM RFC). Consequently the German Rail Infrastructure Manager, DB Netz AG, will join the Management Board in 2018.

RFC OEM runs in the following 8 countries: Germany, Czech Republic, Slovakia, Austria, Hungary, Romania, Bulgaria and Greece, between the cities of Wilhelmshaven/Bremerhaven/Hamburg/Rostock–Dresden–Praha–Vienna/Bratislava–Budapest–Vidin–Sofia–Thessaloniki–Athens–Patras as well as Budapest–Bucharest–Constanta and Sofia–Plovdiv–Svilengrad.

Map of RFC OEM:



— Principal line      ..... Connecting line      - - - - - Diversionary line

Table 2

The railway lines of the Corridor are divided into:

- **Principal line:** on which PaPs will be offered;
- **Diversions line:** on which PaPs may temporarily be considered in case of disturbances, e.g. long lasting major construction works on the principal lines;
- **Connecting line:** lines connecting the corridor lines to a terminal (on which PaPs may be offered but without obligation to do so);
- **Expected line:** any of the above-mentioned lines which are either planned in the future or are under construction but not yet completely in service. Expected line can also be an existing line which shall be part of the Corridor in the future.

Complex definition of RFC OEM according to Regulation (EU) 1316/2013:

Country	Character	Line section / Terminal / Marshalling yard
Federal Republic of Germany	Principal lines	Bremerhaven – Bremen
		Wilhelmshaven – Bremen
		Bremen – Hannover
		Bremen – Wunstorf
		Wunstorf – Magdeburg
		Hamburg – Stelle
		Stelle – Uelzen
		Uelzen – Veerßen
		Veerßen – Stendal
		Stendal – Magdeburg
		Magdeburg – Roßlau
		Roßlau – Falkenberg
		Falkenberg – Dresden
		Rostock – Neusterlitz
		Neusterlitz – Berlin
		Berlin – Elsterwerda
	Elsterwerda – Dresden	
	Dresden – Bad Schandau	
	Bad Schandau – Děčín (DE/CZ)	
	Terminals	Bremerhaven RTB, Bremerhaven NTB, Bremerhaven CTB, Bremerhaven MSC Gate
		Brake J.MÜLLER BBT
		Wilhelmshaven Eurogate, Rail Terminal Wilhelmshaven GmbH
		NORDFROST Seehafen-Terminal
		Hansakai
		Bremen Roland
		Hannover Nordhafen
		Rhenus AG
Hannover-Leineter		
DUSS-Terminal Hannover-Linden		
Megahub Lehrte		
Railport Braunschweig		
Braunschweig Hafen		
Wolfsburg GVZ		
Salzgitter GVZ – KLV Terminal		

Country	Character	Line section / Terminal / Marshalling yard
		Magdeburg Hanse-Terminal
		Roßlau
		Riesa Hafen
		Railport Hamburg 1
		Container Terminal Tollerort (CTT)
		DUSS-Terminal Hamburg-Billwerder
		Eurocargo Container Freight Station and Warehouse GmbH
		Hamburg Eurokombi
		EUROGATE Container Terminal Hamburg (CTH)
		Container Terminal Burchardkai (CTB)
		Hamburg Altenwerder CTA
		Hamburg Wallmann
		Schenken Deutschland AG
		Hamburg BUSS Hansa Terminal
		AMB Steinwerder Distribution Center B.V.
		PCH Packing Center Hamburg GmbH
		Hamburg Süd-West-Terminal
		Hamburg O'Swaldkai
		GTC Rostock
		Rostock Trimodal- RTM
		Railport Rostock
		Berlin Weshafen
		LDZ Elsterwerda
		Dresden-Friedrichstadt GVZ
		Alberthafen Dresden-Friedrichstadt
		Marshalling yards
	Bremen	
	Rostock Seehafen	
	Braunschweig	
	Seelze	
	Seddin	
	Magdeburg	
	Dresden-Friedrichstadt	
Czech Republic	Principal lines	Děčín – Kralupy n.V. – Praha
		Děčín – Nymburk – Kolín
		Praha – Poříčany
		Poříčany – Kolín
		Kolín – Pardubice
		Pardubice – Česká Třebová
		Česká Třebová – Svitavy
		Svitavy – Brno
		Brno – Břeclav
		Břeclav/Hohenau (CZ/AT)
	Břeclav/Kúty (CZ/SK)	
	Diversionary lines	Kolín – Kutná Hora
		Kutná Hora – Havlíčkův Brod
		Havlíčkův Brod – Křižanov
	Terminals	Křižanov – Brno
		Praha Uhřetěves
		Česká Třebová
Brno Horní Heršpice		
Marshalling yards	Lovosice	
	Kolín seř. nádraží	
		Praha - Libeň

Country	Character	Line section / Terminal / Marshalling yard	
		Pardubice	
		Česká Třebová	
		Brno Maloměřice	
		Břeclav přednádraží	
		Havlíčkův Brod	
<b>Austria</b>	Principal lines	Břeclav/Hohenau (CZ/AT)	
		Hohenau - Gänserndorf	
		Gänserndorf - Wien Zvbf	
		Wien Zvbf - Nickelsdorf	
		Nickelsdorf/Hegyeshalom (AT/HU)	
	Diversionary lines	Wien Zvbf – Achau - Ebenfurth	
		Ebenfurth -Wulkaprodersdorf	
		Wulkaprodersdorf/Sopron (AT/HU)	
		Ebenfurth – Wiener Neustadt	
		Gänserndorf – Marchegg	
		Marchegg/Devínska Nová Ves (AT/HU)	
		Parndorf – Kittsee	
		Kittsee/Bratislava Petržalka (AT/SK)	
		Gramatneusiedl – Wampersdorf	
		Wien Zvbf – Wiener Neustadt via Baden	
	Wiener Neustadt – Sopron via Loipersbach-Schattendorf		
	Schattendorf/Sopron (AT/HU)		
	Connecting line	Wien Zvbf – Wien Freudenau – Wien Nordwestbahnhof	
	Terminals	Wien Freudenau	
		Wien Nordwestbahnhof	
Wien Inzersdorf (planned)			
Marshalling yard	Wien Zentralverschiebebahn		
<b>Slovakia</b>	Principal lines	Břeclav/Kúty (CZ/SK)	
		Kúty – Devínska N.Ves	
		Devínska N.Ves – Bratislava hl.st.	
		Bratislava hl.st. – Rusovce	
		Rusovce/Rajka (SK/HU)	
		Bratislava hl.st.– Nove Zamky	
		Nove Zamky – Komarno	
		Komarno/Komarom (SK/HU)	
		Nove Zamky – Sturovo	
	Sturovo/Szob (SK/HU)		
	Diversionary lines	Marchegg/Devínska Nová Ves (AT/SK)	
		Kittsee/Bratislava Petržalka (AT/SK)	
		Kúty – Trnava	
		Trnava – Bratislava východ	
	Connecting lines	Trnava – Galanta	
		Bratislava hl.st. –Dunajská Streda	
	Terminals	Dunajská Streda – Komarno št.hr.	
		Bratislava UNS – Intrans, Slovnáft	
		Bratislava Pálenisko – SpaP	
		Sládkovičovo – Lörinz	
		Štúrovo – Business park Štúrovo	
	Marshalling yards	Dunajská Streda – Metrans	
		Bratislava východ	
			Nové Zámky

Country	Character	Line section / Terminal / Marshalling yard
Hungary	Principal lines	Štúrovo
		Rusovce/Rajka (SK/HU)
		Nickelsdorf/Hegyeshalom (AT/HU)
		Hegyeshalom – Tata
		Tata – Biatorbágy
		Biatorbágy – Kelenföld
		Kelenföld – Ferencváros
		Komarno/Komarom (SK/HU)
		Ferencváros – Kőbánya felső
		Kőbánya felső – Rákos
		Rákos – Újszász
		Újszász – Szolnok
		Szolnok – Szajol
		Szajol – Gyoma
		Gyoma – Murony
		Murony – Lőkősháza
		Lőkősháza/Curtici (HU/RO)
		Ferencváros – Kőbánya–Kispest
		Kőbánya – Kispest – Vecsés
		Vecsés – Albertirsa
		Albertirsa – Szolnok
		Sturovo/Szob (SK/HU)
		Szob – Vác
		Vác – Kőbánya felső
		Sopron – Pinnye
		Pinnye – Fertőszentmiklós
		Fertőszentmiklós – Petőháza
	Petőháza – Győr	
	Diversionary lines	Wulkaprodersdorf/Sopron (AT/HU)
		Vác – Rákospalota–Újpest
		Szajol – Püspökladány
		Püspökladány – Biharkeresztes
		Biharkeresztes/Episcopia Bihor (HU/RO)
		Rákospalota-Újpest – Angyalföld elág.
		Angyalföld elág.– Kőbánya felső/Rákos
		Vác – Vácrátót
		Vácrátót – Galgamácsa
		Galgamácsa – Aszód
		Aszód – Hatvan
		Hatvan – Újszász
	Connecting lines	Ferencváros – Soroksári út
		Soroksári út – Soroksár
		Soroksár – Soroksár-Terminál
	Terminals	Sopron LSZK
		Győr LCH
		Székesfehérvár
		BILK
Budapest Szabadkikötő (port)		
Szolnok		
Debrecen		
Szeged-Kiskundorozsma		

Country	Character	Line section / Terminal / Marshalling yard
Romania	Principal lines	Békéscsaba
		Lőkösháza/Curtici (HU/RO)
		Curtici – Arad
		Arad – Simeria
		Simeria – Coslariu
		Coslariu – Sighișoara
		Sighișoara – Brașov
		Brașov – Predeal
		Predeal – Brazi
		Brazi – București
		București – Fetești
		Fetești – Constanța
		Arad – Timișoara
		Timișoara – Orșova
		Orșova – Filiași
		Filiași – Craiova
		Craiova – Calafat
		Calafat/Vidin (RO/BG)
	Diversionary lines	Biharkeresztés/Episcopia Bihor (HU/RO)
		Episcopia Bihor – Coslariu
		Simeria – Gura Motru
		Craiova – Bucuresti
		Videle – Giurgiu
		Giurgiu/Ruse (RO/BG)
	Terminals	Bucurestii Noi
		Semenic (Timisoara Sud)
		Brasov Triaj
Medias		
Bulgaria	Principal lines	Calafat/Vidin (RO/BG)
		Vidin - Sofia
		Sofia - Kulata
		Kulata/Promachonas (BG/GR)
		Sofia – Plovdiv – Dimitrovgrad – Svilengrad
	Diversionary lines	Ruse – Sindel – Karnobat – Nova Zagora – Simeonovgrad – Svilengrad
		Karnobat - Burgas Port
		Nova Zagora – Stara Zagora – Dimitrovgrad
		Plovdiv – Skutare – Belozem – Mihailovo – Kaloyanovetz – Stara Zagora
		Plovdiv (intermodal terminal; consession granted to logistic company PIMK)
Terminal		
		Athens RS – SKA
		Pireus (ikonio port) – Thriassio
		Thriassio – SKA (SKA= operation center)
		SKA – Inoi
		Inoi – Thiva
		Thiva – Tithorea
		Tithorea – Lianokladi
		Lianokladi – Domokos
Domokos – Palaiofarsalos		

Country	Character	Line section / Terminal / Marshalling yard
		Palaiofarsalos –Mesourlo– Larisa
		Larisa – Evangelismos
		Evangelismos – Leptokaria
		Leptokaria – Katerini
		Katerini – Plati
		Plati-Sindos – Thessaloniki (rail way yard)
		Thessaloniki (rail way yard) – Mouries
		Mouries – Strimonas
		Strimonas – Promachonas
		Kulata/Promachonas (BG/GR)
	Diversionary lines	Svilengrad – Alexandroupolis
		Alexandroupolis – Strimonas
	Connecting lines	Larissa – Volos Port
		Thessaloniki (rail way yard)–Thessaloniki Port
		Athens RS – Piraeus
	Terminals	Ikonio port Pireus
		Volos Port
		Thessaloniki Port
		Alexandroupolis Port
		Inoi
		Sindos
	Marshalling yards	Thessaloniki (rail way yard)
		Strimonas
Central Station of Alexandroupolis		
Mezourlos		

Table 3

## 2.2. Key parameters of corridor lines

The detailed description of Rail Freight Corridor OEM is found in the Transport Market Study that forms part of this Implementation Plan. It contains a precise definition of beginning and ending points and all terminals designated to the Corridor. Furthermore a more detailed description of the corridor lines can be found in the chapter 5.0.1. *Description of the Current State of Corridor Infrastructure.*"

You can find in the TMS the systematic collection of all infrastructure parameters, a detailed description of available capacity and bottlenecks along the Corridor, as well as an overview of existing traffic patterns.

Line characteristics are described with: type of line (principal, diversionary or connecting), section overlapping with other corridor, length of section (in km), number of tracks, electric traction, maximum length of train (in meter), line category regarding axle load, max weight/axle for extraordinary shipments, max slope, profile (P/C), loading gauge, max speed (km/h), ERTMS equipment, and services (intermodal terminals/keeper, marshalling yards/keeper, other service facilities e.g. refuelling, Ro-La, scale) on the line section.

Furthermore Chapter 5 gives a brief overview of the RFC OEM infrastructure within the different member states. More detailed information is available in the RFC OEM Interactive Map available on the RFC OEM website: <http://www.rfc7.eu/> which can be reached from various domains described in paragraph 2.7.

### **2.3. Connections with other corridors**

Orient/East-Med Corridor has connections with the following other RFCs:

- in Břeclav and in Ústí nad Orlicí with RFC North Sea-Baltic and in the cities Praha and Česká Třebová with RFC Czech-Slovak
- in Bratislava/Vienna with RFC Baltic-Adriatic
- in Budapest with RFC Mediterranean
- on Sopron – Győr – Komárom – Nové Zámky / Budapest and Hegyeshalom – Rajka – Bratislava – Nové Zámky railway lines with RFC Amber

The Common line sections of RFC OEM are described in the Transport Market Study.

RFC OEM is set up on the routes of other corridor conceptions defined earlier and serve as the base for integration and harmonisation into one complex corridor network among the EU Member States in the future. These are:

- TEN-T priority axis 22, which runs from Nürnberg and Dresden to Constanta and Athens (common line from Prague to Constanta and Athens),
- ERTMS E which runs from Dresden to Constanta (common line from Prague to Constanta),
- RNE corridor 10, which runs from Hamburg to Budapest (common line from Prague to Budapest).

We believe that the overlap with preceding railway corridor concepts facilitates the development of the freight corridor, partly thanks to the existing cooperation in their framework, partly due to the fact that EU co-funding is mostly allocated to line sections that form part of an international axis and therefore can have major European added value.

The parameters of lines and terminals described in the Implementation Plan of Orient/East-Med Corridor can change over time due to infrastructure investments along the corridor.

Possible requests or comments received from the Advisory Groups or Applicants of RFC OEM, together with results of the Customer Satisfaction Surveys, will be taken into account by MB member companies when making decisions about necessary developments or alterations, too.

The circle of countries and companies (and thus of line sections and terminals) belonging to Orient/East-Med Corridor may also change later due to European Commission incentives or because of changing needs of the transport market.

### **2.4. Corridor Terminals**

As railway lines and terminals together specify the Corridor, terminals are also described in the TMS. All terminals along designated lines have been determined as part of the corridor as well, except if a terminal does not have any relevance for the traffic in the corridor. The marshalling yards, major rail-connected freight terminals, rail-connected intermodal terminals in seaports, airports and inland waterways belong to the terminals presented in the TMS.

## 2.5. Corridor governance

In accordance with Article 8 of the Regulation, the governance structure of the Corridor assembles the following entities:

- Executive Board (EB): composed of the representatives of the Ministries of Transport along the Corridor,
- Management Board (MB): composed of representatives of the IMs and (where applicable) ABs along the Corridor which are responsible for the implementation and operation of the Corridor within their home organisations,
- Advisory Groups of RUs (RAG): composed of RUs interested in the use of the Corridor,
- Advisory Group of Terminal Operators (TAG): composed of managers and owners of the terminals of the Corridor including, where necessary, sea and inland waterway ports.

Eight EU member states are involved in RFC OEM as the picture below shows. The Management Board has even more members, as in Hungary there are two infrastructure managers registered and therefore a capacity allocation office is also concerned. Both the EB and the MB takes its decisions based on a mutual consent. These two bodies were established by a signature of a memorandum of understanding among the parties, signed already in 2011. According to Regulation (EU) 1316/2013 which has amended the Regulation (EU) 913/2010 the RFC OEM is extended to Germany. Therefore, a new EB including Germany has been established by signing a MoU replacing the one from 2011 on 5 December 2017. The extension of the M-B is also in progress, the final draft of the the new MoU was accepted on 14<sup>th</sup> December 2017. The signing ceremony will be organised in the 1st Quarter 2018.

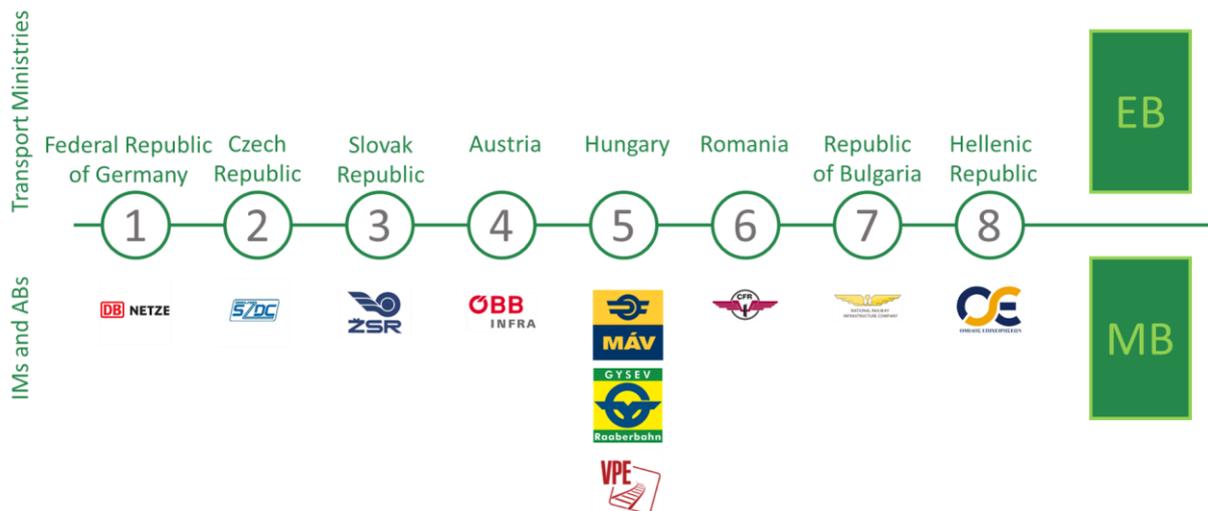


Table 4

### Advisory Groups

The voice of customers is taken into account via the Terminal and the Railway Undertaking Advisory Groups (TAG and RAG). In these groups participation is on a voluntary basis. Advisory Groups (AGs) members have a dedicated area in the RFC OEM website, where all materials on consultation are available, including the Consultation Rules, which is a public document. Registered members also got information via e-mail.

Eleven Advisory Group meetings have been organized so far:

- 30<sup>th</sup> October 2012, Kick-off meeting in Budapest
- 30<sup>th</sup> April 2013 in Budapest
- 14<sup>th</sup> October 2013 at WienCont Terminal in Vienna
- 2<sup>nd</sup> April 2014 in Sopron
- 14<sup>th</sup> October 2014 in Bratislava
- 28<sup>th</sup> April 2015 in Praha
- 21<sup>st</sup> October 2015 in Budapest
- 24<sup>th</sup> May 2016 in Budapest
- 24<sup>th</sup> November 2016 in Bucharest
- 9<sup>th</sup> May 2017 in Athens
- 10<sup>th</sup> October 2017 in Budapest (BILK Terminal)

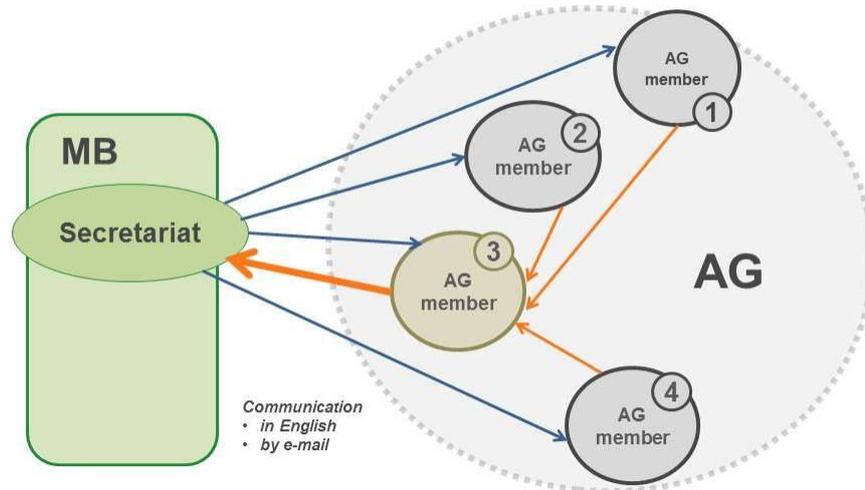
Representative of RFC OEM RAG is Rail Cargo Hungaria.

Representative of RFC OEM TAG is Rail Cargo Austria, the deputy representative is WienCont Container Terminal Gesellschaft.

The main role of the representatives is to coordinate the position of the group. The group's opinion has to contain both majority and minority opinions.

The RFC OEM Secretariat communicates on behalf of the MB with the AGs, it spreads material for consultation to every company registered as AG member, and receives feedback from the Leaders of the two AGs, which contains the opinion of all AG members.

The flow of information is illustrated below.



**Table 5**

The timing and content of consultation with AGs is decided by MB based on the progress of work and the new topics arising in the coming period.

The Letters of Intent signed by initial AG members and the Rules of AG Consultation are enclosed as Annexes 3 and 4 of the Implementation Plan.

Railway undertakings and terminals which have not joined the AGs also have a chance to consult in freight corridor matters through the Secretariat of RFC OEM.

**The RFC OEM organisation**

The Corridor organisation is based on a cooperation agreement between the IMs and (where applicable) ABs along the Corridor.

For the execution of the common tasks the partners / the Management Board have decided to build up the following structure:

The Management Board acts in the form of cooperation, apart from the Memorandum of Understanding which set up officially this body, the rules of cooperation are laid down in the document called Internal Rules of Procedure.

The tasks of the Management Board are coordinated by a Secretariat, carried out by the Hungarian member MÁV.

The Management Board has analysed the conditions of possibly forming an EEIG for the purpose of corridor management, then decided to choose the representative operational management model, to operate a Secretariat, which provides the appropriate administrative support to ensure that the tasks of the MB are properly coordinated and carried out.

In 2011 the MB decided that MÁV Co. shall fulfil the tasks of the Secretariat. Taking into account that RFC OEM Secretariat’s activity is a common interest of every Party, its cost is covered jointly by the MB member (IMs and AB). The Secretariat is located in Budapest.

To fulfil the tasks described in Article 13 of the Regulation a Corridor One-Stop Shop (C-OSS) was established as a single point of contact for requesting and receiving answers

regarding infrastructure capacity for freight trains crossing at least one border along the Corridor.

The Corridor One-Stop Shop (C-OSS), is carried out by VPE, the Hungarian Rail Capacity Allocation Office, applying the representative C-OSS model of RNE (acting as an IM on behalf of all IMs).

In order to facilitate the work regarding the implementation of the Corridor, several permanent and/or temporary Working Groups consisting of experts on specific fields delegated by the IMs/ABs were formed.

In order to facilitate the work regarding the implementation of the Corridor, several permanent and/or temporary Working Groups consisting of experts on specific fields delegated by the IMs/ABs were formed.

<b>Marketing WG</b>	Transport Market Study, Satisfaction Survey, performance objectives and monitoring, definition of Pre-arranged Paths and reserve capacity, Non-RU Applicants.
<b>Traffic Management WG</b>	Harmonisation of traffic management in case of disturbance, working out solutions and procedures for improving the punctuality and reducing the waiting times during the train run. Effective communication between TCCs. In the framework of TPM Coordination working together with the concerned RUs in order to increase the train performance of RFC OEM.
<b>One-Stop Shop WG</b>	C-OSS operation rules, Corridor Information Document, definition of Pre-arranged Paths and reserve capacity, coordination of capacity-allocation btw C-OSS & IMs & Terminals & Applicants.
<b>Infrastructure Development WG</b>	Investment Plan, inventory of projects and financial resources, harmonization of investments along the corridor.
<b>Interoperability and ERTMS WG</b>	Accelerating the establishment of better interoperability along the corridor and enhancing ERTMS deployment, ensure consistency with ERTMS E corridor.
<b>IT Tools WG</b>	Identification of necessary IT tools, facilitating their introduction by every involved IM and AB.
<b>TCR WG</b>	Coordination of planned temporary capacity restrictions along the corridor.

**Table 6**

RNE supports the Corridor by providing harmonised process guidelines for all Corridors and specific, harmonised IT solutions/tools.

The organisation of the Corridor is also described in detail in the Implementation Plan (CID Book 5).

A visualisation of the structure of the Corridor organisation can be seen here:

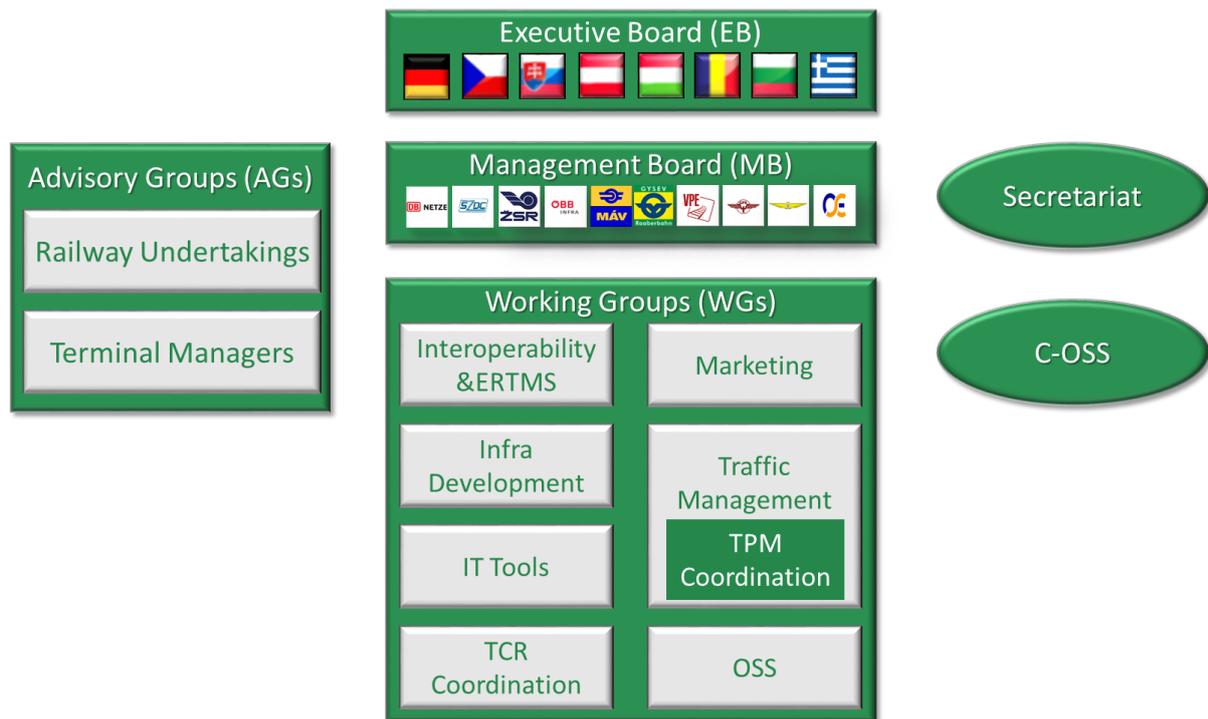


Table 7

## 2.6. EU level cooperation

The entry into force of Regulation 913/2010/EU created the legal framework for the development of rail freight corridors. The on-going work, the implementation of the requirements highlights more and more issues of common interest to several corridors and the need for harmonisation of rules and processes between corridors. It implies a need for effective coordination between the different Rail Freight Corridors, the National Ministries and Regulatory Bodies. Therefore the European Commission is facilitating this coordination in the following ways:

Twice a year the Commission organises a joint meeting of representatives of all Member States, Regulatory Bodies and Infrastructure Managers participating in a Rail Freight Corridor, the forum is called **Single European Railway Area Committee (hereinafter: SERAC) RFC WG meeting**. These meetings are ideal occasions to tackle legal, operational and other specific issues to be addressed jointly by all concerned Member States, Regulatory Bodies and IM-s, and/or common difficulties with the practical implementation of the Regulation. The coordinator of the event is the European Commission, DG-Move.

**The coordinators** of the DG-MOVE also participate frequently in the Executive and **joint Executive/Management Board meetings** of the individual corridors to ensure that the specific issues of these corridors can be addressed in an appropriate way.

The Management Board, the Secretariat and the concerned Working Groups keep close contact with **RNE**. The common operational guidelines provided by RNE contribute to a harmonised development of the corridors, even if they are not endorsed by the Commission and thus have no legal status.

RNE intends to involve RFCs in the elaboration of the solutions to RFC-related issues therefore representatives of all corridors are participating in these demanding work in order to harmonise the processes among the 9 RFCs. The work run in different project working groups.

RNE General Assembly on 3 September 2014 had approved the proposal to involve the RFCs in its organisation structure as associated members. Consequently, all RFCs (one representative of each RFC) are invited to participate at RNE General Assemblies.

In order to establish a network among the 11 rail freight corridors an informal platform of RFCs was created in 2014. These informal meetings called **RFC-Network** is organised 4 times per year, and the chairmanship is based on the rotation principle. RFC OEM had this chairmanship role in May 2017.

All representatives of RFC MBs can suggest some topics for the discussion where the exchange of views and experiences would be useful to reach common understanding in different operational rules. These regular meetings are important occasions to find out common approach and solutions for relevant questions and problems concerning the operation of the rail freight corridors.

Another forum has been established on the basis of bottom-up initiative. The so-called C-OSS Community, community of C-OSS managers of the 9 operating RFCs meet regularly and deals with the following topics:

- Development of RFC and PaP-related functions in PCS
- Improvements in PCS user interface
- Common deadlines for alternatives proposals in case of conflicts
- Common communication tool for publishing PaPs (PaP Catalogue)
- Common KPIs of RFCs
- Timetable process improvements

UIC has also launched a project for the efficient coordination of rail freight corridors, called **ECCO**. There is a regular meeting between ECCO and RFCs. Representatives meet 2 times per year, establishing a constructive dialogue for the exchange of information and opinion.

RFC OEM plays important role in the different platforms, its opinion, practices and experiences gained in the Central-Eastern Europe region can force the cooperation among RFCs and wider the network approach concept.

## 2.7. RFC OEM website

The webpage of RFC OEM was established in December 2012 after a long working and decision period on its concept (structure, content and design). It works with four domains on the addresses [www.rfc7.eu](http://www.rfc7.eu), [www.rfc7.com](http://www.rfc7.com), [www.corridor7.eu](http://www.corridor7.eu) and [www.corridor7.com](http://www.corridor7.com) (all of them links to [www.rfc7.eu](http://www.rfc7.eu)).

This platform was planned to be used to facilitate access to information concerning the use of the main infrastructure and available services on the freight corridor in order to have a comprehensive, transparent and user-friendly solution how to find data and information for

the customers and visitors all kind of levels. Therefore the Management Board decided to use the website for two main purposes: on the one hand for communication among Executive Board, Management Board, Working Groups or Advisory Groups members, and on the other hand for sharing information with business partners interested in using the corridor. In accordance with that aim a browser-independent, multi-layer solution was developed with password access to specialised contents and with editable menu, submenu and textual content. The duty of the Management Board is to regularly update the content, publish documents, to develop the structure according to the incoming customer needs.

During the determination of website elements we concentrated on the usability of the website (with the harmony of high level information, interactivity and design). The strategy was to develop a specific, measurable, attainable, realistic and time-based (smart) tool with:

- user-centric guideline, which means to ensure the quickest and easiest way to show the information from all corridors;
- ensure prompt content, which means that the professionals of the corridors have own „administration flat” what they have to update;
- user friendly services as easy way to reach and manage the services;
- user friendly design.

The objective is to make the website an always-changing and updated platform of communication.

### **3. Essential Elements of the Transport Market Study**

#### **3.1. Introductory remarks**

In 2013, the first version of the Transport Market Study (TMS) was prepared with the coordination of the Marketing Working Group of the RFC OEM, with the support of internal human resources of ŽSR's railway research institute VVÚŽ, and all relevant other working groups of RFC OEM.

In order to allow the Management Board of RFC OEM to develop the corridor in line with market and customer needs and complying with the legal obligation for a periodical update, the Management Board of RFC OEM decided in 2016 to carry out an update of the TMS. This decision was also triggered by the entry into force of the EU Regulation 1316/2013 ("CEF-Regulation") and in particular its Annex II according to which the amendments of the Principal Route of RFC Orient/East-Med (former referred to as „RFC7" but due to the CEF-Regulation the RFCs has to be called on their names, therefore the abbreviation „RFC OEM" is used in all updated documents) has to be carried out which means the extension to Germany (Bremerhaven/Wilhelmshaven/Rostock/Hamburg) and further extensions in the South Eastern parts of the corridor (Burgas/Svilengrad concerning the Bulgarian and until Patras concerning the Greek part of the RFC). According to the CEF Regulation the extensions laid down in its Annex II shall be included at latest 10 November 2018 in the case of RFC OEM. These inclusions shall be based on market studies and take into consideration the aspect of existing passenger and freight transport in line with Article 14(3) of the Regulation 913/2010.

It is important to highlight that the update was also expected to provide the Management Board with a valuable knowledge and feedback to its efforts and tactical and strategical decisions to tackle current challenges and to develop the corridor in line with market needs and customer expectations, allowing it to identify and exploit new development potentials.

Following the decision of the Management Board ("MB"), the update procedure was pursued by the cooperation of VVÚŽ again and by the relevant working groups of RFC OEM using the "Terms of Reference for update of the Transport Market Study of RFC OEM" as guidelines whereby all the relevant tasks were laid down which were necessary to be carried out for the update. The Terms of Reference was approved by the MB on 2<sup>nd</sup> June 2016 in Athens.

It is important to note that during the update procedure the results of Satisfaction Surveys of 2015 and 2016 were reflected upon highlighting the bottlenecks which still need to be worked upon. Consideration of experiences of the operational RFC has crucial importance because these serve with an input inter alia to define the type and the amount of capacity required on the corridor.

The relevant actions defined within the frame of the "Action Programme" (document attached to the Orient/East-Med (OEM) Ministerial Declaration signed by the representatives of the relevant Ministries of the OEM Member States on 21<sup>st</sup> June 2016 in Rotterdam) were also strongly considered during the working procedures because the Action Programme define a set of bottlenecks to work upon which are in certain aspects elaborated within the current

TMS update (for example the identification of bottlenecks stemming from the lack of implementation of the minimum TEN-T infrastructure requirements).

According to the RFC-Regulation, the main aim of the Transport Market Study should be to provide input for the Management Board in order to be able to identify the necessary lines - principal or diversionary - to be designated to the RFC and support the infrastructure managers and allocation body concerned to be able to define the number and quantity of necessary Pre-arranged Paths to the respective lines. In the case of the extension to Germany these tasks have been carried out as well as in the case of further extensions to South Eastern Europe (Burgas/Svilengrad and Patras).

The TMS update procedure examined the rail capacity requesting behaviour of the customers along the respective Member States of RFC OEM and accommodated the further alignments and designation of further lines which have been requested for addition or modification by the customers, evidently preceded by a prior approval of both Boards. A proper revision of the lines designated to the RFC OEM was accomplished.

The first version of the TMS elaborated in 2013 served as a basis for the update.

In this context, the update of the TMS in particular focused onto the following tasks:

- Update of information in the current TMS: update of data accuracy and information of infrastructure parameters
- Extensions of RFC OEM to Germany and further extensions as requested by the Annex II of the CEF-Regulation
- Analysis of the Connectivity to Turkey
- Assessment of the lines designated to the RFC OEM
- Compliance with TEN-T minimum infrastructure requirements
- Bottleneck analysis
- SWOT-analysis and success factors
- Analysis of capacity offer
- Last-mile infrastructure along the corridor

Taken into consideration the deadline set in the Annex II of the CEF Regulation the update of the TMS had to follow a strict time schedule - defined by the Marketing WG - according to which a final draft study was delivered by June 2017 and then sent to consultation to the Railway – and Terminal Advisory Groups by the Secretariat. The input received from the aforementioned groups were analysed with utmost care by the Marketing WG and then incorporated accordingly to the final draft study. Then both the Executive- and the Management Boards received the draft study and the summary document “Essential Elements of the Transport Market Study” for review. The comments of the MB were taken into account by the Marketing WG and incorporated into the relevant text, paying attention to the consistency of the documents. The MB approved the final draft study as well as the summary document on 27 October 2017 and mandated the Leader of the Marketing WG for using the approved documents as basis for making further modifications in case demanded by the Executive Board. The comments from the Executive Board were also duly

incorporated and taken into account. The final approval by both Boards was accomplished in December 2017.

The complete version of the Transport Market Study forms part as Annex 5 of the Implementation Plan.

The following summary aims to demonstrate the main focus points of the TMS-update process and its results. As previously mentioned, VVÚŽ, the Railway Research Institute of the Slovak Railways cooperated in the elaboration the document to the Marketing WG following the structure already provided in the Implementation Plan. The document was delivered by September 2017 by VVÚŽ and was carefully revised by the Marketing WG and the Management Board prior to its submission for review to the Executive Board whose comments then were as far as possible taken into account.

### **3.2. Objectives of the Transport Market Study**

Rail Freight Corridor RFC OEM (prior to the amendments of Regulation No 1316/2013 it was named “RFC Orient”) has been established based on Regulation No 913/2010 of the European Parliament and the Council of 22 September 2010 concerning a European rail network for competitive freight transport (hereinafter referred to as the “RFC-Regulation”) and it was put into operation on 8 November 2013 shortly before the deadline set out in the aforementioned Regulation. The duty of the Management Board is to carry out and periodically update a Transport Market Study (hereinafter referred to as “TMS”) in accordance with Article 9(3) of the RFC-Regulation. The RFC-Regulation was amended by adoption of Regulation No 1316/2013 of the European Parliament and the Council of 11 December 2013 establishing the Connecting Europe Facility (hereinafter referred to as the “CEF-Regulation”).

The objective of the update of the TMS was – besides complying with the legal requirement for periodical update of the TMS – to allow the Management Board to take decisions on the dedicated capacity to be provided on the corridor and on any measures aiming at developing the corridor in line with customer expectations and market needs.

In order to do this, the update of TMS took into account relevant developments in RFC OEM, feedback from customers using the corridor including results of Satisfaction Surveys as well as changes in the market and legal environment since the elaboration of the previous TMS.

The TMS of RFC OEM was updated with the necessary extensions to Germany, in Bulgaria and in Greece together with the actualisation of the data content of the previous study. The update was carried out taking into account the requirements of the CEF-Regulation; the changes regarding the principal and diversionary lines which have been approved by both the Management and Executive Boards have been included as well as the relevance of the transport flows between Turkey and the RFC OEM were examined. The aforementioned extensions required by the CEF-Regulation are as follows:

- extension to Germany (Wilhelmshaven/Bremerhaven/Hamburg/Rostock),
- extension in Bulgaria (Burgas/ Svilengrad),
- extension in Greece (Patras).

Furthermore, as part of its transport and infrastructure policy the European Commission has adopted a Trans-European Network for Transport (TEN-T) with the Core Network Corridors as the key governance structure for implementation. The Core Network Corridors are geographically largely aligned with the Rail Freight Corridors; the Rail Freight Corridors form the rail freight backbone of the Core Network Corridors.

In order to support the European railway network as regards freight transport and to improve the interoperability and harmonisation of procedures, some technical and operational initiatives have been launched. These are, for example:

- the development of interoperability through the technical specifications for interoperability (TSIs) in particular relating to Traffic Operation and Management (OPE TSI) and TSI relating to Telematic Applications for Freight Services (TAF TSI). Of course, further TSIs such as those relating to infrastructure, vehicles, etc. are also of vital importance for the improvement of interoperability.
- the activities of RNE, an organization connecting 34 infrastructure managers and allocation bodies across Europe. The main objective is to enable easy and quick access to information regarding the European railway infrastructure regarding international railway traffic and to improve the quality and effectiveness of cross-border rail transport entailing the development of harmonised international business processes.

### 3.3. Methodology of Work and Methods of Investigation

#### 3.3.1. Materials used in TMS elaboration

The complete elaboration of all TMS tasks required the analysis and processing of various technical, transport, capacity and economic indicators. A wide range of sources, including public sources such as official European and national statistics, statistics and documents published by international organisations (e.g. IMO, OECD, World Bank), EU legislation, standards, etc. as well as documents from the Rail Freight Corridors and the participating railway infrastructure managers and the Core Network Corridors were used. This information was completed by data and material obtained from questionnaires to railway infrastructure managers and railway undertakings and from reviewing relevant literature.

The statistical and analytical data required for elaborating the individual parts of TMS, with which it will be possible to determine the strategic objectives of RFC OEM, are shown in the table below:

*Statistical and analytical indicators monitored in TMS*

<b>Technical parameters</b>	Standard length of train, maximum length of train, class of line, signalling equipment, electrification system, loading gauge, average speed of train, speed limits, slopes/ gradients
<b>Transport performances</b>	Development of transport performances on corridor lines Development of transport performances on all lines of member state
<b>Macroeconomic indicators</b>	GDP development and prognosis in Member States Share of individual economic sectors in GDP in %
<b>Microeconomic indicators</b>	Level of infrastructure charges by train types Transit time

<b>Modal Split</b>	Development of modal split between individual modes of transport
<b>International transport</b>	Transport and traffic performances in international transport
<b>Capacity analysis</b>	Development of total transport capacity utilization Development of transport capacity utilization of individual corridor lines Waiting times and reasons of delays are monitored separately from this study by the Train Performance Management Working Group
<b>Other indicators</b>	Investment, technical and technological measures, proposal of extension of lines and terminals, etc.
<b>Corridor indicators</b>	Corridor benefits

Table 8

### 3.3.2. Methods used in TMS elaboration

The TMS partial objectives have been worked out using and combining various scientific qualitative and quantitative methods, including literature analysis, statistical analyses, comparative analysis, SWOT-analysis, prognostic methods, benchmarking and brainstorming.

## 3.4. Characteristics of RFC OEM

### 3.4.1. RFC OEM basic structure

For the European rail freight corridors, bodies have been established which through their activities ensure the proper functioning of the corridor, meeting the main and partial objectives of corridor establishment and responding to the challenges of effective daily operation and the provision of the best possible solution to customer needs.

#### **RFC OEM route according to Regulation of the European Parliament and Council (EU) No. 1316/2013 on the establishment of the Connecting Europe Facility:**

— Bucureșt-Constanța;

Bremerhaven (\*)/Wilhelmshaven (\*)/Rostock (\*)/Hamburg (\*)- Praha-Vienna/Bratislava-Budapest; — Vidin-Sofia-Burgas (\*)/Svilengrad (\*) (Bulgarian-Turkish border)/ Promachonas-Thessaloniki- Athína-Patras (\*)

**Member States:** Federal Republic of Germany, Czech Republic, Slovak Republic, Republic of Austria, Hungary, Romania, Republic of Bulgaria, Hellenic Republic.

**New member state:** Federal Republic of Germany – expected entry in 2018.

**Date of putting RFC OEM into operation:** 08.11.2013

**Seat of Corridor-One Stop Shop (C-OSS):** Budapest

### 3.4.2. Analysis of capacity and bottlenecks

The analysis of the capacity of the lines included in the rail freight corridor OEM revealed that:

- most of the capacity of the lines and line sections is used in the range of 50 - 89 %,
- within the corridor, there are lines with insufficient capacity which may adversely affect the qualitative indicators of rail freight transport,
- within the corridor, there are approximately 40 % lines and line sections with a utilized capacity below 50 %, these lines may be effectively used in case of higher capacity demands, or as diversionary transport routes.

In case of high demand on infrastructure manager services it is possible to use those lines efficiently, the capacity of which is utilized below 50 % with a minimal impact on the quality of rail system operation. A high increase in transport performances could lead, without taking mitigating measures, to the overloading of some lines and line sections, such as Hamburg – Stendal, Wilhelmshaven – Hannover – Magdeburg, Dresden – Bad Schandau, sections of the Praha – Česká Třebová line and the line north of Přerov, the Bratislava node and sections of the Arad – Sighisoara line (all the mentioned sections have a track capacity use >90%). The situation can be solved by upgrading or building of new railway infrastructure and/or by changing of the transport organization and signalling systems and/or re-routing of trains. However, such measures may require high investment costs, so it is necessary for Member States and infrastructure managers to be prepared to allocate the funding in order to increase the capacity of the lines and line sections concerned.

The analysis of bottlenecks on the railway infrastructure of OEM corridor showed no decrease compared to the analysis of bottlenecks carried out in 2013. However, this situation can currently be assessed as stable, although an increase in bottlenecks is expected due to the growth of transport performances, the lack of capacity, low level of modernization of railway infrastructure and limited resources allocated to the removal of bottlenecks. In case the bottlenecks are not gradually removed, there is a risk of reducing the required quality of railway infrastructure services, thus rail transport services will not be competitive. The infrastructure managers and Member States must therefore pay sufficient attention to the form of measures and investments in the gradual removal of bottlenecks which represent a restriction of reliable, safe, continuous and competitive transport infrastructure.

### 3.5. Economic and Transport Analysis of RFC OEM

On the basis of the collected and evaluated statistical economic, transport and traffic data in the OEM corridor countries, it is possible to conclude the following:

- GDP growth in individual countries,
- positive economic development, increase in living standards,
- higher movement of population,
- higher demand for transport services,
- requirements for higher level of transport services, e.g. reliability, shorter transport time,
- pressure to modernize the lines,
- pressure to remove bottlenecks of railway infrastructure,
- demand for ecological transport – need for electrification of lines,

- increase in transport performances of the rail system,
- shift of transport performances from road to rail,
- higher performances of international rail transport,
- promotion of intermodal transport,
- need to improve the quality of intermodal transport services,
- fair and non-discriminatory allocation of railway infrastructure capacity,
- increase in rail investment,
- need for harmonisation of charges.

Based on these conclusions, there are the following opportunities and possibilities to meet the objectives of the OEM corridor:

- making maximum use of EU and national funding opportunities for rail investments and ensuring effective and timely absorption of available funding,
- improving planning of infrastructure works and including incentives in tendering of works for minimised impact on traffic operations,
- focusing financial resources on removal of bottlenecks,
- electrification of lines – leading to more efficient train operations and lower social costs of transport,
- market-oriented capacity and capacity products and efficient management of provision and allocation of railway infrastructure capacity,
- huge market potential for modal shift if today's existing problems and shortcomings of the corridor can be solved,
- upgrading of railway infrastructure of the corridor to higher standards with regard to parameters relevant for freight traffic, such as train length, axle and meter load, speed; swift implementation of TEN-T infrastructure minimum requirements or higher on continuous line sections,
- effectively addressing border crossing issues,
- harmonisation of operational rules,
- harmonisation of charges within the countries of the corridor on a competitive level,
- effective provision of information.

Routing itself and the state of the development of the corridor countries create several possibilities to meet its basic objectives. The analyses carried out have shown sufficient potential to maintain and increase the importance of the corridor within the European transport infrastructure. As an increase in the demand for international rail freight services is expected, it is necessary to continuously improve the quality of railway infrastructure and the services of the OEM corridor.

### **3.6. Prognosis of Transport Performance Development**

Transport performances on railway infrastructure are the most important data indicating the demand for rail services. Several aspects affecting infrastructure, quality of services and external costs result from transport performances. It is necessary to know the development of transport performances in order to form the objectives and the subsequent strategy of the OEM corridor. The development of transport performances is assumed on the basis of the prognosis that includes three scenarios for the OEM corridor: realistic, optimistic and pessimistic.

### **Bases for prognosis:**

1. Model used for prognosis: AAA algorithm with exponential alignment. AAA algorithm is a software capable for making prognosis based on the provided data.
2. Confidence interval: 95 %.
3. Time span of prognosis: 2018 – 2025 (8 years).
4. Examined indicator: transport performances in rail passenger and freight traffic.
5. Input data: Transport performance (train km, gross ton km) made on the lines of individual infrastructure managers - statistical data of infrastructure managers
6. Presentation of results: in tabular form for each scenario separately.

### **Based on the prognosis, the following main conclusions can be stated:**

- increase in the performances of international rail freight transport by about 3-4% per year, mainly due to higher quality of services provided, flexibility, reliability and economic development,
- increase in rail passenger transport performances, affected primarily by economic development and an increase in the quality of services,
- resulting savings in social costs,
- increase in transport performances on lines included in the OEM corridor, in particular on the principal line sections following the implementation of the projects aiming at improving the infrastructure standards,
- higher quality of communication and information technologies required in particular on the cross-border sections having longer waiting times for freight trains than 2 hours,
- higher reliability of rail system following the achievement of TEN-T minimum infrastructure requirements and elimination of hindering factors for seamless interoperability, including cross-border sections whereby the target of 2 hours' waiting time is desired to be achieved as per the Action Programme of 2016,
- it is necessary to put some pressure on the harmonisation of charges for rail and road in order to achieve the desired modal shift to rail.

### **3.7. Analysis of the Connectivity of RFC OEM to Turkey**

The analysis of goods import to the EU from Turkey demonstrated an increase in the goods value which is primarily due to the economic growth of EU countries which becomes evident by the increased demand of consumers and EU countries for higher-value goods produced in Turkey. The progressive increase of goods import to the EU from Turkey in million € was recorded also in RFC OEM Member States. The highest value of goods is exported to the Federal Republic of Germany and the least to the Slovak Republic.

In terms of goods volumes (tons), the analysis showed a more mixed picture. During the period 2002 to 2015 there was a decrease in goods import to RFC OEM Member States from Turkey. The most tons of goods were directed at the Federal Republic of Germany and the least at the Slovak Republic. The different trend in goods import to RFC OEM Member States from Turkey is due to the import of goods with higher value and lower weights.

The analysis of goods import to Turkey from EU countries carried out an increase in goods import in mill. €. For the whole monitored period the goods in the highest value in total were imported in 2015. The value increase of goods import to Turkey was recorded from

RFC OEM Member States, too. The analysis of goods import to Turkey in thousands tons carried out a significant decrease in 2015 compared to 2002. The analysis of goods import to Turkey in thousands tons from RFC OEM Member States showed a decrease. Most of the goods were imported to Turkey from the Federal Republic of Germany and the Republic of Bulgaria. The least of goods were imported to Turkey from the Slovak Republic. The different trend in goods import from RFC OEM Member States to Turkey is due to the import of goods with higher added value and with lower weights.

Based on the analysis of imports and exports of goods between Turkey and the RFC OEM Member States, we can conclude:

- increasing the added value of imported and exported goods between Turkey and the EU countries,
- decreasing the transport performances of freight transport between Turkey and the EU countries,
- Demand for fast, reliable and safe international transport, in particular on the route between Turkey and the Federal Republic of Germany.

Based on the analytical findings we can conclude the following concerning the connectivity of Turkey with RFC OEM:

- Turkey upgrades and electrifies its railway network and plans further transport infrastructure development in the future,
- high transport potential has been identified in Turkey,
- achieved high share of freight transport by road,
- low share of transport performances of rail freight,
- potential for rail freight is not used,
- perspective of growth of transport performances in international rail transport,
- the cross-border connection between Turkey and Bulgaria is a single-track,
- the lines included in RFC OEM, which connect the railway infrastructure with the Turkish railway infrastructure, are currently not electrified, however electrification of the line from Plovdiv to the Bulgarian border station Svilengrad is ongoing.

### **Main findings**

On the basis of the research of the problems in question we can state that the connection of the RFC OEM railway infrastructure to the Turkish railway infrastructure may bring several benefits for the Member States, society, transport, customers, railway undertakings and the RFC OEM itself. Therefore, the improvement of the cross-border railway infrastructure is highly recommended.

In order to achieve the benefits we propose to take the following measures and procedures:

- to examine the possibility of introducing regular freight trains of combined transport system RO – LA (technological, technical and economic evaluation),
- to electrify railway infrastructure belonging to RFC OEM relevant for traffic form and to Turkey. On Bulgarian territory NRIC is working on the electrification of the section between Plovdiv and Svilengrad.
- to ensure integration of information systems,

- integration of signalling systems,
- to adapt the railway infrastructure to at least 740 m train length.

### **3.8. Transport Potential between RFC OEM and Third Countries**

An important aspect of the development and transport importance of the OEM corridor is the generation and attraction of new traffic flows. New transport opportunities need to be exploited also from countries outside the corridor and EU Member States. A significant potential regarding new transport flows was demonstrated from/to Turkey. Based on the attraction of new transport flows, an analysis of transport potential of the countries of Central Asia and Caucasus region, so-called third countries belonging to TRACECA (Transport Corridor Europe – Caucasus - Asia) corridor, was carried out. The TRACECA corridor includes: Azerbaijan, Bulgaria – OEM member, Georgia, Iran, Kazakhstan, Kyrgyzstan, Moldova, Romania – OEM member, Tajikistan, Turkey – separate chapter, Ukraine and Uzbekistan.

Based on the analysis of import and export of goods between EU countries and the countries of Central Asia and Caucasus region it is possible to conclude and assume:

- goods of the highest value were imported into EU countries from Azerbaijan, Iran and Ukraine,
- goods from other countries were exported in lower values not relevant for rail freight,
- the largest amount of goods was imported into EU countries from Azerbaijan, Iran, Kazakhstan and Ukraine,
- negligible amount of goods, which does not create significant rail transport opportunities, was imported into EU countries from other countries,
- import of goods into EU countries from the countries concerned has an overall upward trend and such trend can be expected in the future, based on GDP development in the countries concerned,
- import of goods into the countries concerned from the EU has an overall downward trend,
- approximately one third of the imported and exported goods between these countries and EU countries were made between the countries included in the OEM corridor,
- rail freight relevant transport potential for the RFC OEM can primarily be expected with Iran and Kazakhstan,
- other countries do not currently export and import a significant amount of goods that would significantly increase the demand for rail freight services.

New transport opportunities that would be suitable for transport by rail can be expected from and/or to Kazakhstan and Iran. As far as the transport flows are concerned, directional inequality may cause challenges. An important aspect for the growth and development of the OEM corridor in the long term could become, in particular, the transit through the countries of Central Asia and the Caucasus region to EU countries via OEM corridor railway infrastructure from China and India. This creates opportunities for international cooperation and the subsequent provision of comprehensive transport services through, in particular, intermodal transport. The “Iron Silk Road”-initiative could become of particular interest for RFC OEM, since the RFC OEM is serving those ports and border

crossing points in South-Eastern Europe which are natural entry points for traffic along the Iron Silk Road.

Apart from the potential provided by third countries, following the completion of the infrastructure works concerning the railway connection between Athens and Patras, the sea links between the port of Patras and the ports of the Ionian Sea and the Adriatic Sea are expected to significantly enhance the intermodal efficiency of the Corridor, providing a considerable boost to its flows.

### **3.9. Strategical Review of RFC OEM based on SWOT Analysis**

Based on the SWOT analysis, it is necessary to take the following measures for the RFC OEM into account:

- segmentation of services and customers,
- agreements and contracts with carriers,
- increase the awareness to the corridor's services and products,
- improve planning and management of infrastructure works with the aim to reduce impact on traffic,
- promote improvement of infrastructure standard in order to allow more efficient train operations (leading to increased competitiveness of rail transport), in particular train length,
- develop and implement mitigating measures to avoid disruption of train services at border crossings for too long times,
- harmonisation of operational procedures and elimination of unnecessary rules (for example harmonise the number of buffer wagons), taking into account the Action Programme of 2016.

### **3.10. Strategical Map of the RFC OEM (proposed by VVÚŽ)**

In order to fulfil the basic objectives of the OEM corridor it is necessary to set out the strategic steps for their fulfilment. One of the appropriate methods for creating strategic processes is the Balanced Score Card. Balanced Score Card is a complex strategic method that looks at the subject surveyed through four perspectives and their mutual relationships. It is an assessment from financial-, customer-, process-, learning- and growth perspective. The Balanced Score Card methodology is based on the vision and strategy of the object surveyed and on that basis for each perspective the mission and strategic objectives, to which certain metrics and their target values are assigned, will be determined. All perspectives are logically connected and linked and this method, therefore, provides a complex view of the object surveyed and its performance. The detailed strategic map can be found in Chapter 13, Figure 21 of the TMS.

**According to the proposed strategical map the RFC OEM main visions are:**

- being a competent and highly appreciated partner and service provider to rail freight undertakings, shippers, cooperation partners and stakeholders,

- maintaining a strong position in the outstanding performances such as C-OSS services and further development of RFC product according to market demand,
- continuously improving on indicators where customer satisfaction is not yet satisfying,
- growth of rail freight performances,
- strengthening the position of rail freight within the EU, development of cross-border rail interoperability in order to shift more long-distance traffic to rail, thus, to contribute to reach the goals laid down in the White Book for Transport of the European Commission,
- progressive reduction of social costs of transport such as reduction of CO<sub>2</sub> emission with the shifting of more and more traffic to rail,
- expand cooperation with rail carriers and individual rail infrastructure managers through increased range of services.

**According to the proposed strategical map the RFC OEM mission consists particularly of:**

- providing smooth, reliable and high quality services for rail freight undertakings, terminals and end customers,
- increasing awareness and facilitating the use of RFC OEM's services through progressive deployment of customer-friendly IT-tools such as PCS system of RNE,
- developing effective procedures in removing bottlenecks (infrastructural, administrative or else),
- stability of rail system status and tradition by minimizing impact of works on traffic operations and ensuring a good state of infrastructure maintenance,
- good responsiveness to customer requirements at the highest levels,
- maintaining a good cooperation with the Core Network Corridor Coordinator of the CNC OEM in order to be able to effectively contribute to the development and modernization of railway infrastructure with regard to the specific needs of rail freight,
- facilitation of intermodal transport (RO-LA and Unaccompanied Combined Traffic),
- promoting rail as an environmentally friendly mode of transport among prospective shippers and political decision-makers,
- continuously contributing to the development of the rail system within the EU and the network of EU Rail Freight Corridors.

### **3.11. Conclusions and Recommendations**

The international rail freight corridor OEM was established in 2013 in order to ensure coordination between the Parties concerned, more effective transport management by introducing the concept of the one-stop shop, fulfilment of the requirements of the RFC-Regulation, and to boost some increase in transport performances as well as to improve transport continuity across the Member States concerned aiming at a sufficient prioritization of rail freight. Based on the analyses carried out, marketing survey, comparison of modal split and other important qualitative and quantitative transport indicators, we can state that even if there are lots of challenges the RFC OEM seems to be on the right track. This conclusion can precisely be backed by the latest results of the User Satisfaction Survey of

2016 which are inter alia the improvement in the field of traffic management issues, overall communication procedures between the customers and the operative management of the corridor and last but not least the results of the Train Performance Management showed growing tendency in comparison with that of the survey of 2015. It is important to stress that these results stem from customers who actually use the corridor's services. The real strengths of the corridor proved to be in the field of path allocation and the services provided by the C-OSS. Customers highly valued the customer orientation, newsletters, business know-how and availability of the C-OSS Manager and welcomed the Flex-PaP concept in general.

Thanks to the corridor's route alignment, geographical position and developing economic indicators, a definitive growing tendency regarding traffic potentials between the Member States of the RFC OEM as well as new transport opportunities between Turkey, Kazakhstan, Iran and China can be forecasted. In order to better serve this progress, RFC OEM's operative management developed new initiatives aiming at the improvement of the corridor's offer which were welcomed by our customers. One good example could be that for the first time in 2016, the path-construction process was preceded by a new, service-oriented initiative offered by the C-OSS Manager, inviting all potential applicants into a preliminary consultation in order to improve the quality of PaPs for timetable 2017 and Reserve Capacity for timetable 2016 by collecting their needs. As a result, the PaP-catalogue of 2016 offered to our Customers 13.9 million path-kilometers (km\*running days) of high-quality paths for international traffic. Regarding the annual requests for international paths 14% of the available corridor capacity, i.e. 1.92 million path kilometers, was pre-allocated which was a major increase compared to the 9% in 2015. Furthermore, it is worth to mention that the total requested running days were 1662 with an average 138,5 per request. The longest requested PaP distance was 1643.9 km with an average of 1010 km per request. These numbers show us a clear interest in utilizing corridor-capacity mainly by the long-distance traffic between Germany and Turkey. When it comes to the assessment of the need for Reserve Capacity, there had been 8.2 million path-kilometers provided to serve the interim needs of RFC OEM customers out of which 1.38 million requested and allocated through the C-OSS, which showed also an increase compared to the timetable year of 2015. Following strong request from the market, the C-OSS started to examine the feasibility to significantly lower the deadlines for requesting reserve capacity before the running day of the train (results are expected to 2017/2018).

The accession of Germany scheduled to 2018 will contribute to the further growth and development of the corridor. Furthermore, following the completion of the infrastructure works concerning the railway connection between Athens and Patras, the sea links between the port of Patras and the ports of the Ionian Sea and the Adriatic Sea are expected to significantly enhance the intermodal efficiency of the corridor, providing a considerable boost to its flows.

Due to its strategical importance, the RFC OEM could have further potentials for extension, but any future modification in its current alignment needs to be underpinned by significant increase in demand for international rail freight services.

Based on the comprehensive results of the TMS for RFC OEM, the following measures for ensuring further development and fulfilling the strategic objectives resulting from the corridor's mission and vision are recommended:

	<b>Recommendation</b>	<b>Recommended responsible</b>
1	Examination of the possibility to adapt priority rules to the needs of rail freight transport.	Infrastructure Managers of RFC OEM (IMs)
2	Increase the number and the quality of train paths for the international rail freight transport.	Corridor-One Stop Shop office (C-OSS), IMs
3	Regularly evaluate the satisfaction of Railway Undertakings (RUs) and other users of the whole railway network in order to ensure and promote quality rail services.	European Commission (EC), RFC OEM, IMs
4	Proceed towards the creation of a European-wide harmonised regime for infrastructure charges.	EC, IMs
5	Internalization of negative external costs in transport sector.	EC, European Parliament (EP), European Council, Member States (MSs)
6	Increase, adapt and regularly monitor investments for the removal of bottlenecks along the corridor.	MSs, EC, IMs, TEN-T Core Network Corridor (CNC)
7	Increase, adapt and monitor investments in modernization of basic and connecting transport infrastructure including last-mile within the corridor.	EC, CNC, IMs
8	Coordinate the investment plan regarding the transport infrastructure of the corridor.	EC, CNC, MSs (national investment plans), IMs
9	Ensure proper and effective maintenance of railway infrastructure of the corridor.	IMs
10	Ensure proper and effective traffic management rules and stable and reliable coordination process for temporary capacity restrictions (TCRs) along the corridor.	IMs, C-OSS, RUs
11	Actively cooperate with other RFCs	MSs, IMs, RFC Network, RNE-RFC High-Level meeting
12	Extend the network of local and regional intermodal terminals that can provide high-quality and competitive intermodal transport services.	EC, MSs
13	Permanent and effective cooperation with intermodal transport operators, Railway Undertakings and Authorized Applicants.	Intermodal Terminals, Terminal Advisory Group of RFC OEM (TAG), RUs, Railway Advisory Group of RFC OEM (RAG)
14	Continuously improve the quality of market surveys and overall communication between the RFC bodies (as defined by the RFC-Regulation) in order to succeed problem solving.	RFC OEM Executive Board (EB), Management Board (MB), RAG, TAG, RFC OEM Working Groups (WGs); EC, CNC Coordinator and Consultants for CNC OEM

Table 9

These recommendations are based on the results of the TMS, the empirical knowledge of IM's experts working with the corridor, OEM corridor staff, railway undertakings, marketing research and customer satisfaction surveys. The recommendations aim at the achievement of a modal increase for international freight services to rail and the improvement of long-distance cross-border rail services. Well-set and customer-oriented services will contribute to a higher demand for rail freight services, effective modal split, savings in negative external costs of transport and sustainable development. This will contribute to fulfil the vision and mission of the OEM corridor as well as to the achievement of the main goals adopted by the European Commission in its White Book on Transport of 2011 towards a competitive and resource efficient transport system. These recommendations should be considered as the challenges for further improvement of the OEM corridor, although several of them cannot be directly implemented through the OEM corridor alone but with the cooperation and involvement of all respective stakeholders.

## **4. List of measures**

### **4.1. Coordination of Temporary Capacity Restrictions**

#### **4.1.1. Background**

Independent Temporary Capacity Restrictions working group (TCRs WG) was established in mid of 2016 by the Management Board. The aim of the decision was to split the Traffic management working group and create independent working group deeply focused on tasks connected with capacity restrictions planning, coordinating and publishing.

TCRs WG kick off meeting was held on June 6th in Prague and all WG members confirm the purpose to improve the TCRs planning and coordinating process. Since then several experts' work was done.

#### **4.1.2. Legal framework**

TCRs WG processes are based especially on Article 12 "Coordination of works" of the European Regulation No 913/2010 giving the responsibility for TCRs coordination and publication to RFC Management Board:

"The management board shall coordinate and ensure the publication in one place, in an appropriate manner and timeframe, of their schedule for carrying out all the works on the infrastructure and its equipment that would restrict available capacity on the freight corridor."

Taking in account this article RNE developed Guidelines for Coordination / Publication of Temporary Capacity Restriction (version 2.0) which is the main legal basis for TCRs WG activities. TCRs WG members fully respect these Guidelines and follow them for securing proper environment for coordination of TCRs.

#### **4.1.3. Tasks of the TCRs WG**

TCRs WG takes care about following tasks:

- Steers the coordination process according the RNE Guidelines.
- Ensures the publication of planned TCRs for customers.
- Ensures the process of measure and quality evaluation of TCRs Coordination / Publication.
- Cooperates with C-OSS to improve the quality of train path allocation.
- Develops the environment for publication of unplanned (not within the scope of RNE TCR guideline) and extraordinary capacity restrictions to avoid train delays and other undesirable circumstances.
- Supports the development of a TCR coordination and planning process to improve rail freight traffic.

#### **4.1.4. TCRs Coordination and publication process**

Process for coordination and publication of TCRs is described in Chapter 4 of CID book 4.

### **4.2. Corridor OSS**

The tasks of the C-OSS, legal background and related documentation are described in Annex VII – C-OSS Operational Rules.

### **4.3. Traffic Management**

In line with Article 16 of Regulation, the management board of the freight corridor has put in place procedures for coordinating traffic management along the freight corridor.

Traffic Management is the prerogative of the national IMs and is subject to national operational rules. The goal of Traffic Management is to guarantee the safety of train traffic and achieve high quality performance. Daily traffic shall operate as close as possible to the planning.

In case of disturbances, IMs work together with the RUs concerned and neighbouring IMs in order to limit the impact as far as possible and to reduce the overall recovery time of the network.

National IMs coordinate international traffic with neighbouring countries on a bilateral level. In this manner they ensure that all traffic on the network is managed in the most optimal way.

Detailed rules and procedures are described in Chapter 5 of CID Book 4.

#### **4.3.1. Traffic Management in the Event of Disturbance**

The goal of traffic management in case of disturbance is to ensure the safety of train traffic, while aiming to quickly restore the normal situation and/or minimise the impact of the disruption. The overall aim should be to minimise the overall network recovery time.

In order to reach the above-mentioned goals, traffic management in case of disturbance needs an efficient communication flow between all involved parties and a good degree of predictability, obtained by applying predefined operational scenarios at the border.

The communication procedure and the available tools are described in Chapter 5 of CID Book 4.

#### 4.4. Quality Evaluation

Quality of service on the freight corridor is a comparable indicator (set of indicators) to those of the other modes of transport. Service quality is evaluated as a performance. Performance is measured with Performance Indicators. These indicators are the tools to monitor the performance of a service provider. What regards the international rail freight services the obligation is based on the provisions of Article 19 of the Regulation.

#### 4.5. Performance Monitoring Report

The measurement of performance of rail freight transportation on RFC OEM lines is first of all an obligation stemming from the Article 19 (2) of Regulation (EU) 913/2010, on the other hand it contributes to the development of RFC OEM services, as well.

RailNetEurope with the cooperation of Rail Freight Corridors elaborated the Guidelines for Key Performance Indicators of Rail Freight Corridors. It provides recommendations for using a set of KPIs commonly applicable to all RFCs.

##### **A. On RFC OEM the following common KPIs are measured:**

- Capacity management: measuring the performance of RFC OEM in constructing, allocating and selling the capacity of RFC OEM (in line with Articles 13 and 14 of the Regulation), monitored in terms of:
  - Volume of offered capacity
  - Volume of requested capacity
  - Volume of requests
  - Volume of capacity (pre-booking phase)
  - Number of conflicts
  - Volume of requested reserve capacity (km\*days requested)
  - Volume of requested reserve capacity (number of PCS dossiers requested)
  - Commercial speed of PaPs

The KPIs included in this area inter alia contains the KPIs listed in the Annex 3 of the Framework for Capacity Allocation on the Orient/East-Med Rail Freight Corridor.

- The KPIs of Operations, which measure the performance of the traffic running along RFC OEM monitored in terms of punctuality, volume of traffic and delay reasons:
  - Punctuality at origin
  - Punctuality at destination
  - Number of train runs
  - Delay reasons
- The KPIs of Market development, which measure the capability of the RFC OEM in meeting the market demands are monitored in terms of:

- Traffic volume
- Relation between the capacity allocated by the C-OSS and the total allocated capacity

In order to use the same quality of data and to reduce the overall efforts of the RFCs and RNE, mainly the same IT tools are used for the calculation of the commonly applicable KPIs. In case the data can be provided by PCS or TIS, then the data processing tool is OBI. If the necessary data are not available in RNE IT tools, the RFCs collect the data (e.g. via their IMs from the IMs' IT tools) and do the calculation individually. The calculation formulas of common KPIs can be found in the Guidelines for Key Performance Indicators of Rail Freight Corridors.

The results of the Capacity management and Operation KPIs shall be published in the Annual Report of RFC OEM.

#### **B. RFC OEM specific indicators which were approved by the Management Board**

Response time to questions of customers related to the information function of C-OSS shall be: as soon as possible, but max. within 5 working days.

The following indicators of quality should be monitored:

- Response time of C-OSS to questions of customers
- Total transport time of corridor trains
- Dwelling time in border stations

The Management Board plans to increase allocated pre-arranged paths and reserve capacity by min. 2% annually.

For the purposes of the next TMS studies, all kind of corridor flows will be monitored, i.e. not only trains with capacity allocated from PaPs, but also from tailor-made paths, catalogue paths and ad-hoc paths .

The following indicators of performance shall be monitored:

- Number of corridor trains per month
- Number of the border crossing allocated/used path corridor trains
- Length of path

The process for monitoring performance is described in RNE Guidelines for Punctuality targets.

Performance will be monitored by national systems at the first stage, then by TIS later on.

Next performance indicators which should be monitored for TMS purposes:

- Number of trains on corridor with capacity allocated by national OSS
- Tonnes
- Gross tonnes km
- Train km

## **4.6. User Satisfaction Survey**

Under RNE coordination, a Customer Satisfaction Survey was held in 2017 for all Rail Freight Corridors except RFC9. Having a common survey managed by RNE provided for comparable results and avoided that the same customers, operating on different corridors, could be subject to different questionnaires with different structures.

Results of RFC OEM Satisfaction Survey can be found on the website of RFC OEM.

#### 4.7. Train Performance Management (TPM)

The TPM Coordination is a permanent working body in the framework of Traffic Management Working Group set up by MB in order to establish a framework for the coordination and communication of TPM issues among RUs and IMs on RFC OEM.

The aim of TPM Coordination is to erase the gaps in the processes during the train run, to improve punctuality across borders and handover points and as result to increase the commercial speed. Detailed information about this activity can be found in Chapter 6 of Corridor Information Document Book 4.

A framework has been developed by RNE in the "Guidelines for Coordination / Publication of Planned Temporary Capacity Restrictions".

### 5. Investment Plan

#### 5. 1. Description of the Current State of Corridor Infrastructure

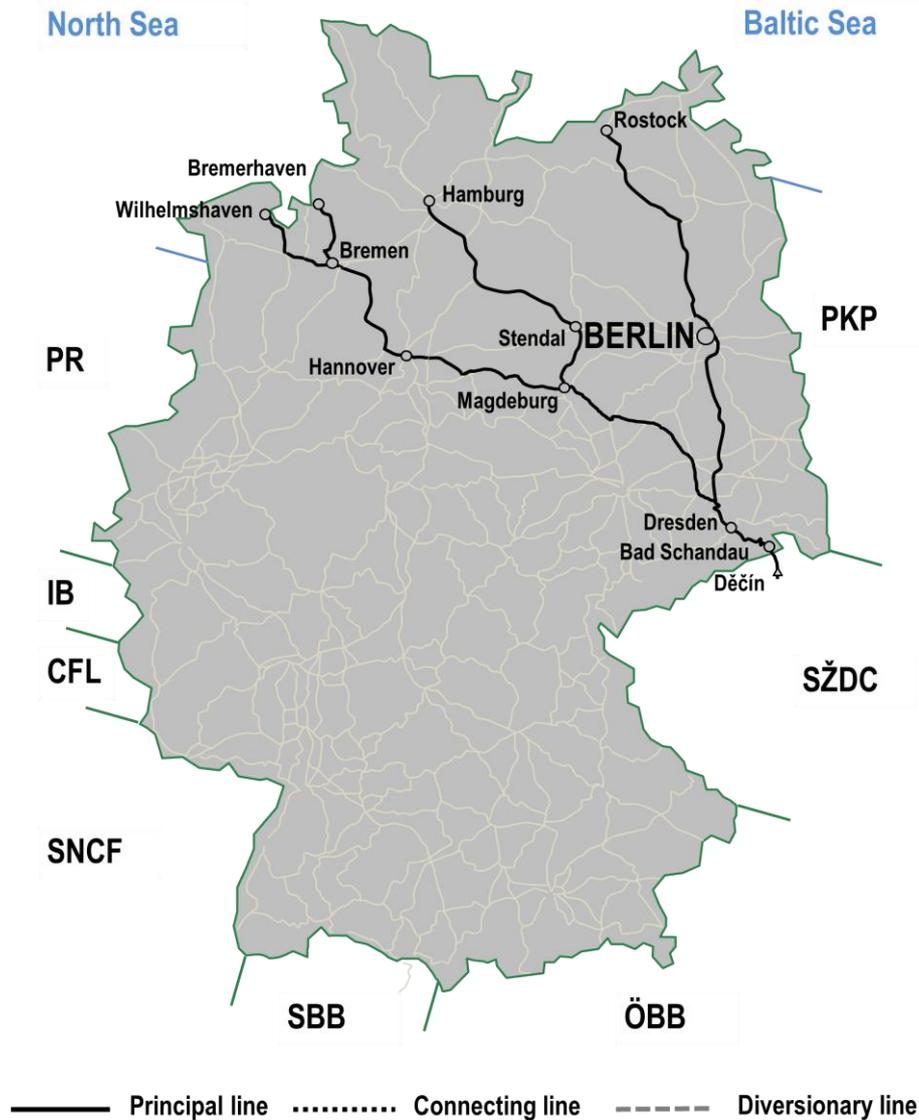
The Chapter below includes brief overview of the RFC OEM infrastructure within member states. More detailed information is available in the RFC OEM Interactive Map available on the RFC OEM Website: <http://www.rfc7.eu/>

Parameter	Lenght in km		
Number of tracks	Principal Lines	Diversiory Lines	Connecting Lines
3	33	0	0
2	4365	1105	249
1	1646	1713	164
<b>Total</b>	<b>6045</b>	<b>2818</b>	<b>663,7</b>
Traction	Principal Lines	Diversiory Lines	Connecting Lines
25 kV AC / 50 Hz	3294	1732	59
15 kV AC / 16,7 Hz	1574	97	0
3 kV DC	479	11	192
Non-electrified	698	978	162
Axle load	Principal Lines	Diversiory Lines	Connecting Lines
C2	129	86	0
C3	1474	1047	4
C4	440	496	109
D2	14	0	0
D3	70	5	9
D4	3918	1184	292

Table 10

### Federal Republic of Germany

On the territory of Federal Republic of Germany, the extension of RFC OEM lines directed at Wilhelmshaven/ Bremerhaven/ Hamburg/ Rostock – Dresden– Bad Schandau – Děčín (CZ) is under consideration and will be implemented in 2018. The routing of RFC OEM in the Federal Republic of Germany in graphical form is shown in Table 11.

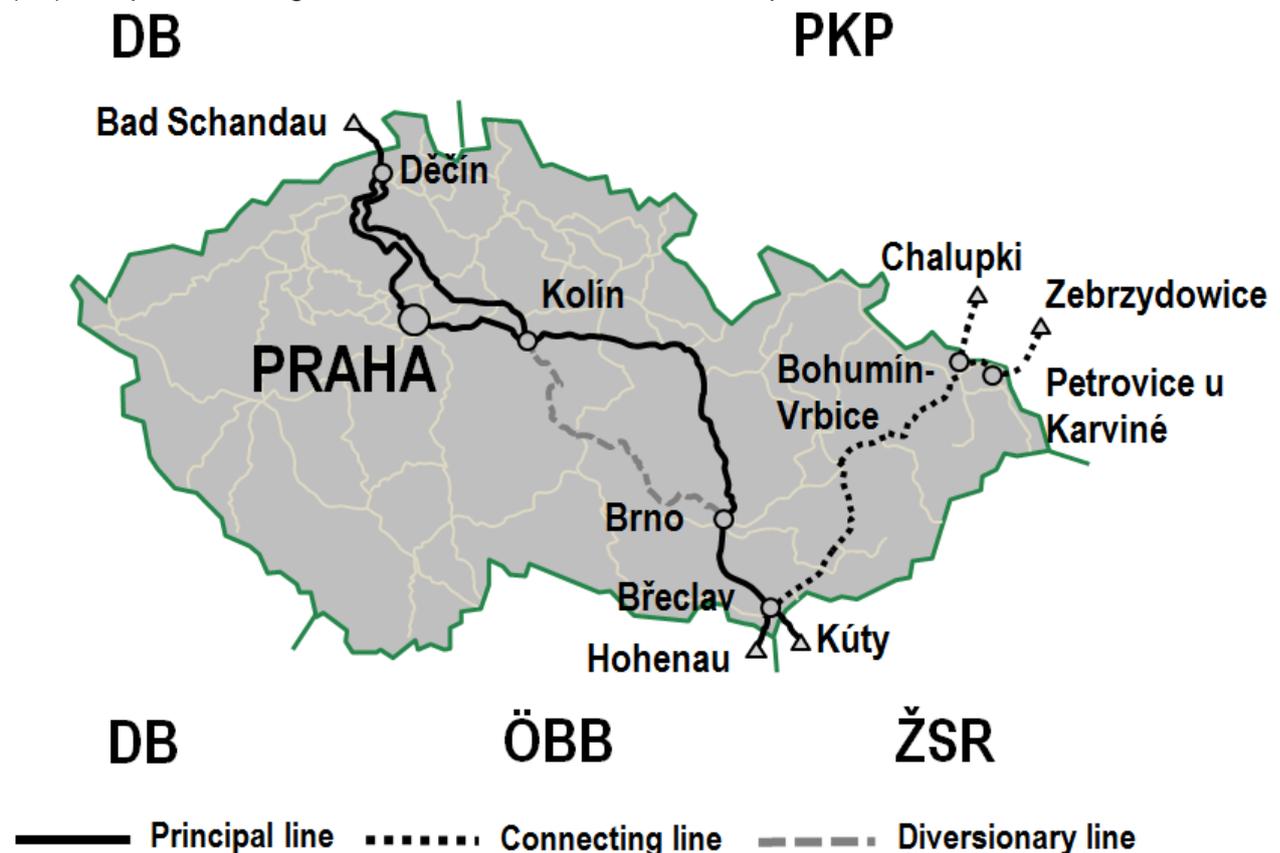


**Table 11:** Graphical representation of RFC OEM routing under consideration on DB network  
 (Source: József Ádám Balogh, C-OSS manager)

The graphical representation of the German principal lines in Table 11 show the connection of German ports of the North Sea and Baltic Sea via the cross border in Bad Schandau with the existing RFC OEM railway infrastructure. Such connection creates more favourable conditions especially for intermodal transport. Furthermore with the extension to Germany RFC OEM will have a connecting point with the RFC Scandinavian-Mediterranean in Hamburg and RFC OEM will have long overlapping sections with RFC North Sea - Baltic.

### Czech Republic

RFC OEM principal line in the Czech Republic is routed through the transport nodes Praha - Kolín - Česká Třebová - Brno/Břeclav - Hohenau (AT)/Břeclav - Lanžhot - Kúty (SK). Extension to the Federal Republic of Germany is directed at Praha/ Kolín - Ústí nad Labem - Děčín - Bad Schandau (DE). Diversionary line is routed through Kolín - Kutná Hora - Havlíčkův Brod - Křižanov, while connection to the principal line is in the railway station Brno. The connecting line from PKP infrastructure to SŽDC is routed through Břeclav - Ostrava and border crossings Bohumín-Vrbice – Chalupki (PL) and Petrovice u Karviné - Zebrydowice (PL). Graphical routing of RFC OEM lines in the Czech Republic is shown in Table 12.



*Table 12: Graphical representation of RFC OEM routes on SŽDC network (Source: József Ádám Balogh, C-OSS manager)*

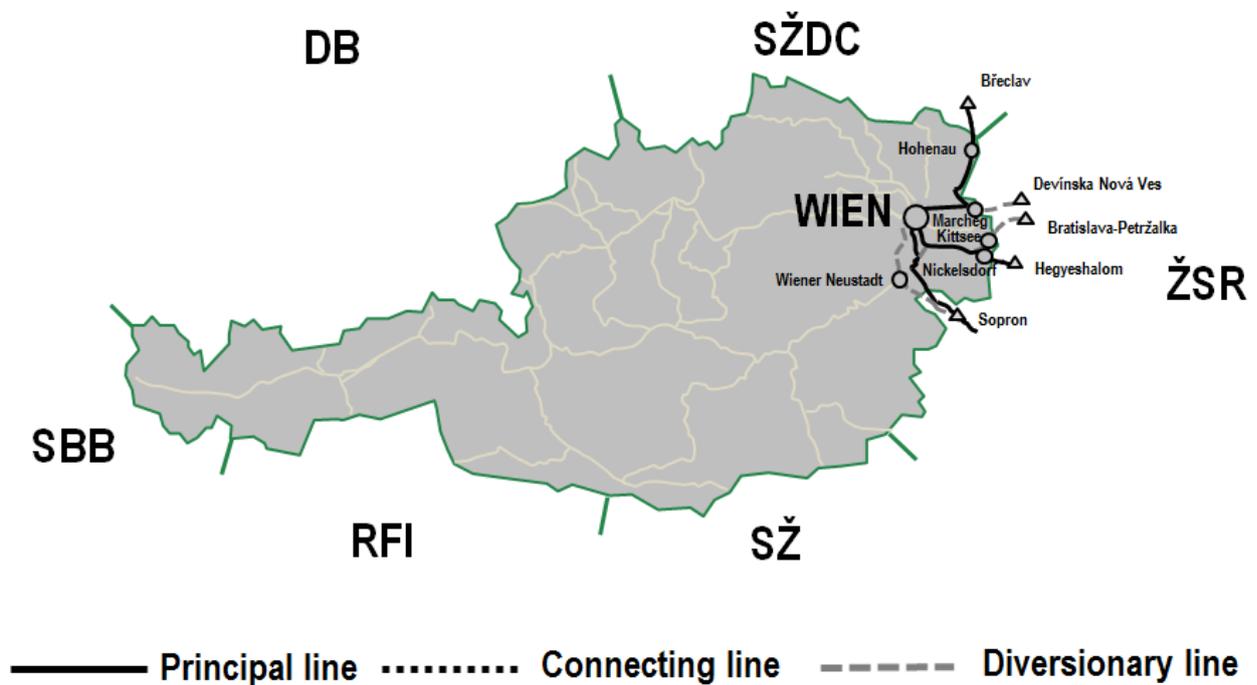
RFC OEM corridor is connected to RFC 5 corridor in the cities Břeclav and Ústí nad Orlicí (the Czech Republic) while the connecting line of RFC OEM is part of RFC 5. At the same time, RFC OEM in the capital Praha and Česká Třebová is connected to RFC 9. RFC OEM corridor is also overlapping with RFC North Sea - Baltic on the lines from the German-Czech border to Děčín, Praha and Kolín. Connection of several rail freight corridors in the Czech Republic creates favourable conditions for cooperation between particular corridors as well as transport and technological effectiveness for railway undertakings.

## Austria

On ÖBB network, RFC OEM principal line passes through border crossing stations Břeclav (CZ) – Hohenau to the capital of Austria – Vienna and continues to Hungary through the border crossing Nickelsdorf - Hegyeshalom (HU). Diversionary lines are redirected from the principal line in the railway station Gänserndorf to the border crossing Marchegg – Devínska Nová Ves (SK) and from the railway station Parndorf to the border crossing Kittsee - Bratislava Petržalka (SK).

Another principal line is the line from Vienna via Ebenfurth to Sopron (HU). Following negotiations in April 2017, the Management Board took the decision to change the state of the Vienna-Ebenfurth-Sopron line from a “diversionary line” to a “principal line”. From Ebenfurt to Vienna, The Potterdorfer (Ebenfurth-Wampersdorf - Vienna Inzersdorf Terminal - Wien Zentralverschiebenahnhof) is routed.

Another alternative route is from Vienna via Wiener Neustadt to Sopron. At the same time, RFC OEM in Austria (in Vienna) is connected to RFC 5. The graphical routing of RFC OEM lines in Austria is shown in Table 13.



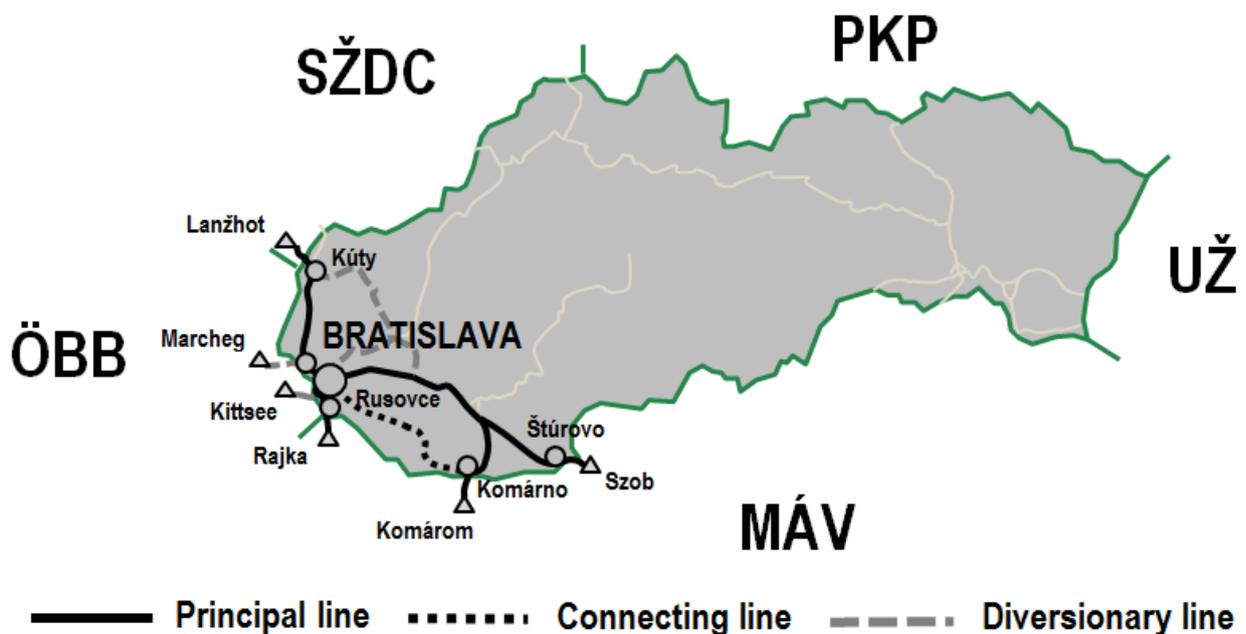
**Table 13:** Graphical representation of RFC OEM routes on ÖBB network  
(Source: József Ádám Balogh, C-OSS manager)

## Slovak Republic

The principal line on ŽSR network runs from the Czech Republic (Lanžhot (CZ) – Kúty) to Hungary through Bratislava in three branches. This includes the following lines:

- Bratislava - Rusovce - Rajka (HU),
- Bratislava – Nové Zámky - Komárno - Komárom (HU),
- Bratislava - Nové Zámky – Štúrovo - Szob (HU).

The first diversionary line included in RFC OEM on ŽSR network is routed Lanžhot (CZ) - Kúty - Trnava towards Bratislava and Galanta with a connection to the principal line. Another diversionary line is the connection of the border stations to the principal line. This includes the border crossings Marchegg (AT) – Devínska Nová Ves and Kittsee (AT) - Bratislava - Petržalka. The line Bratislava – Komárno through Dunajská Streda is classified as a connecting line on ŽSR network. At the same time, RFC OEM in the Slovak Republic, in its capital Bratislava, is connected to RFC 5. The graphical routing of RFC OEM lines in the Slovak Republic is shown in Table 14.



*Table 14: Graphical representation of RFC OEM routes on ŽSR network  
(Source: József Ádám Balogh, C-OSS manager)*

## Hungary

The principal line on MÁV network is routed from ÖBB network (border crossing Nickelsdorf/Hegyeshalom) and is connected to the second principal line in the city of Győr leading from the city of Sopron (from the Sopron terminal). This principal line from Sopron continuous on GYSEV / Raaberbahn infrastructure on Austrian territory (the border crossing: Baumgarten) to Ebenfurth. Infrastructure owned by GYSEV / Raaberbahn ends in the middle of the Neufeld an der Leitha bridge (operating up to Ebenfurth), from here further up towards Vienna, ÖBB is the competent Infrastructure Manager. Routing of principal line from the territory of the Slovak Republic:

- Rusovce (SK) - Rajka - Hegyeshalom - Győr - Komárom- Budapest,
- Komárno (SK) - Komárom- Budapest,
- Štúrovo (SK) - Szob - Vác - Budapest.

The Rajka – Hegyeshalom - Győr infrastructure section is managed by GYSEV, following that, MÁV is the competent infrastructure manager towards Lőkősháza.

The subsequent routing of the principal line is in continuation Budapest - /Újszász -/Cegléd-Szolnok - Lőkősháza - Curtici (CFR). Connection of the line from ÖBB network to the border crossing station Sopron then continues as principal line in the direction of Győr - Komárom - Budapest. Diversionary lines included in RFC OEM on MÁV railway network are:

- Vác - Újszász,
- Budapest- Cegléd- Solnok,
- Szajol - Biharkeresztes - Oradea (CFR).

RFC OEM is simultaneously connected to RFC 6 in the Hungarian capital Budapest. The graphical routing of RFC OEM routes in Hungary is shown in Table 15, where GYSEV's rail lines are coloured in yellow. The remaining tracks are managed by MÁV.



**Table 15:** Graphical representation of RFC OEM routes on MÁV and GYSEV network

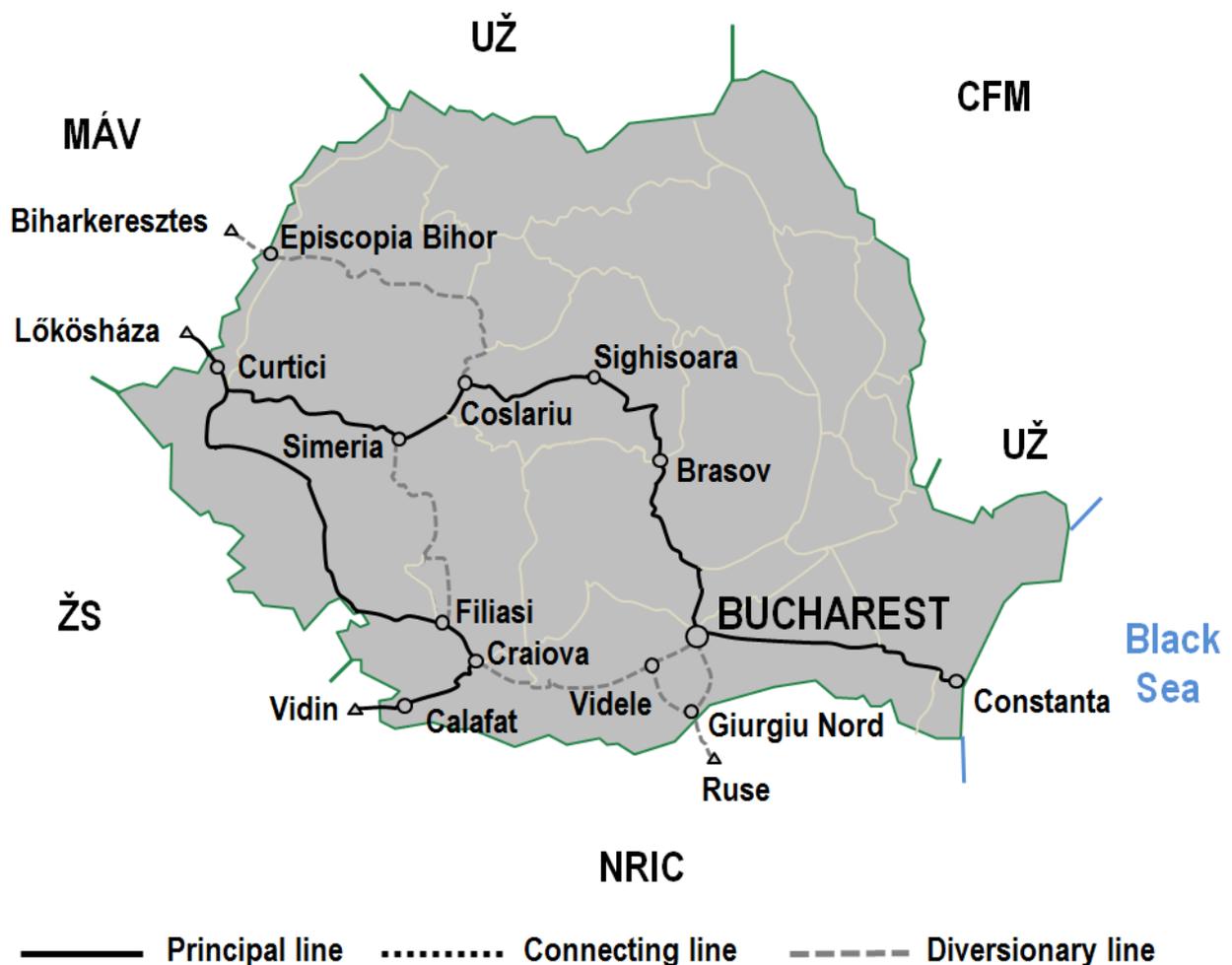
(Source: József Ádám Balogh, C-OSS manager)

## Romania

The principal line from Hungary through border crossing Lőkősháza (MÁV) – Curtici continues to the station Arad and then divides into two branches:

- Arad – Simeria – Coşlariu – Braşov – Bucharest – Constanţa,
- Arad – Orşova – Craiova – Calafat – Vidin (NRIC).

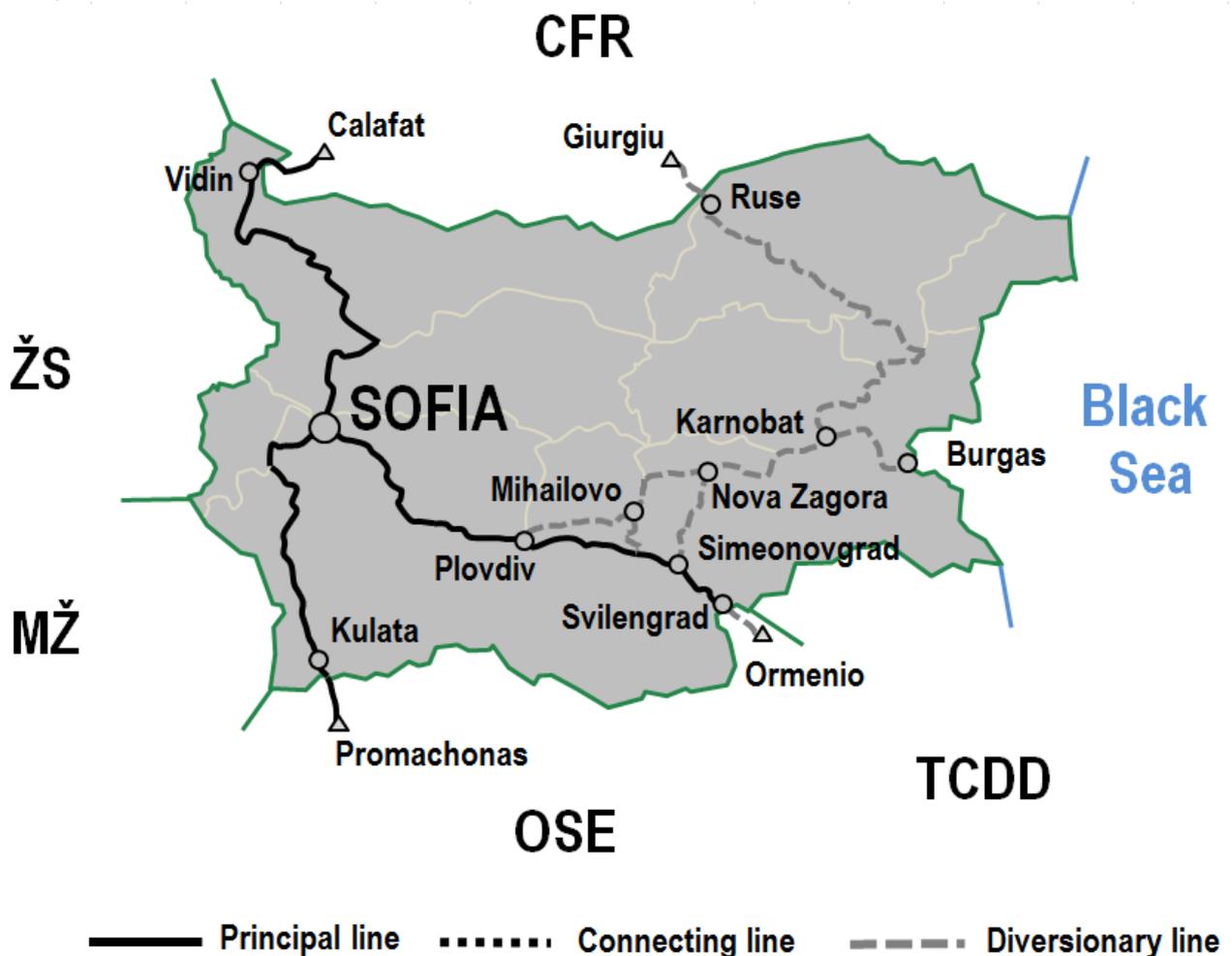
Connection of these two branches is provided by the routes Simeria - Filiaşi and Craiova - Videle - Bucharest. Border crossing lying on the diversionary line Giurgiu - Ruse (NRIC) is connected from the diversionary line through Videle railway station and from the principal line through Bucharest railway station. The diversionary line from MÁV network from border point Biharkeresztes (MÁV) - Oradea connects to the principal line in Coşlariu railway station. Graphical routing of RFC OEM routes in Romania is shown in Table 16:.



**Table 16:** Graphical representation of RFC OEM routes on CFR network  
(Source: József Ádám Balogh, C-OSS manager)

### Republic of Bulgaria

The principal line on the territory of Bulgaria passes through its capital Sofia from Romania to Greece in the direction: Golenti (RO) - Vidin - Mezdra - Sofia - Kulata - Promachonas (GR). Following the meeting of the Management Board on June 2 2016, the originally diversionary line was reclassified to the principal line in the direction Sofia - Plovdiv - Svilengrad - Ormenio (GR). The diversionary line is led through the border crossing Giurgiu (CFR) - Ruse - Karnobat /Burgas – Nova Zagora – Stara Zagora and connection with the principal line in three points in Simeonovgrad, Dimitrovgrad and Plovdiv railway stations. The connection of RFC OEM to Turkey is possible through the border crossing Svilengrad (BG) – Kapikule (TR) and then to the Turkish railway network. The map of RFC OEM routes in the Republic of Bulgaria is shown in Table 17.



**Table 17:** Graphical representation (map) of RFC OEM routes along NRIC network  
 (Source: József Ádám Balogh, C-OSS manager)

### Hellenic Republic (Greece)

The principal line on the territory of the Hellenic Republic starts off the border crossing Kulata (NRIC) - Promachonas and continues to the capital of the Hellenic Republic – Athens with connecting line to Piraeus. Another connecting line in continuation from the principal line is in Larissa railway station to Volos railway station. The diversionary lines are continuation of the principal line in the direction Svilengrad (NRIC) - Ormenio – Alexandroupolis – Serres.

The connection of RFC OEM with the Republic of Turkey is possible through Pithio (GR) railway station and Demirköprüin Turkish border crossing station and then to Turkish railway network. Graphical routing of RFC OEM routes in Greece is shown in Table 18.



**Table 18:** Graphical representation of RFC OEM routes on OSE network  
(Source: József Ádám Balogh, C-OSS manager)

### 5.1. List of Investment Projects

The Investment Plan is without prejudice to the competence of the Member States regarding infrastructure planning and financing. Also this is without prejudice to any financial commitment of a Member State.

In accordance with Article 11 of the Regulation the Management Board of RFC Orient/East-Med considers investment planning along the corridor as a very important matter. Therefore the Management Board with the assistance of the Infrastructure Development Working Group has drawn up the Investment Plan of the involved 8 countries along the freight corridor.

The complete Investment Plan forms Annex 7 of the Implementation Plan. The periodically update will be done according to the legal requirements deriving from the regulation. The Secretariat will make an update information via RFC OEM website concerning the actual situation of the investment project list. The format and the necessary/useful data were consulted with AGs.

## **5.2. Bottlenecks**

Both the TMS and the Investment Plan of the Implementation Plan contain information about the main infrastructural and capacity bottlenecks identified along the corridor as well. Most limiting factors are:

- Non-electrified sections
- Lower axle load than 22,5 t
- Clearance gauge smaller than GC
- Maximum speed lower than 100 km/h line speed
- No possibility of operation of 740 m long trains

## **5.3. ERTMS Deployment Plan**

The RFC OEM, defined in accordance with the Regulation, is overlapping with ETCS Corridor E that was defined by the TSI CCS CR (2009/561/ES) and enlarged by the south branch via Bulgaria to Greece.

In the establishing process of the RFC OEM was agreed that the ETCS Corridor E project structures will be included in the organization structure of the RFC OEM. In this process the ETCS Corridor E Management Committee was transformed to the Interoperability & ERTMS Working group of the RFC OEM organization structure and the new companies that represent the south branch of the RFC OEM were joined into the WG.

The basis of the information provided in the following chapters are the national implementation plans according to EU Regulation 2016/919 (TSI CCS) respectively the Commission implementing regulation (EU) 2017/6 on the European Rail Traffic Management System European deployment plan.

The aim of the European Rail Traffic Management System (ERTMS) European deployment plan is to ensure that vehicles equipped with ERTMS can gradually have access to an increasing number of lines, ports, terminals and marshalling yards without needing Class B systems in addition to ERTMS.

Thus, member states shall develop a national plan for the implementation of this TSI, considering the coherence of the entire rail system of the European Union taking into account the economic viability of the rail system. This plan shall include all new, renewed and upgraded lines, in particular a detailed timeline for equipping those lines with ETCS and decommissioning of Class B systems.

### **5.3.1 Interoperability & ERTMS Working Group**

- is a supporting instrument for the Governance structure of the Rail Freight Corridor, it prepares data and documents for making decisions and realizes these decisions
- has as basic task to implement the ETCS project plan and to coordinate all other activities in this domain so as to improve the quality of the RFC
- is in charge of creating the organizational, technical and operational conditions so that ETCS on the RFC can be entirely operational on the whole stretch in time and for this reason it has to set up Expert teams and ad hoc groups if necessary
- ensures that the RUs are involved in the project and their requirements are considered in the implementation plans

### **Statutes of the Interoperability & ERTMS WG**

The Interoperability & ERTMS WG provides for the RFC Governance structure the organization of following activities in the area of the ERTMS deployment on the RFC OEM lines:

- monitoring of the preparation and the realization of the investment plans of involved companies through an Annual Status Report
- exchange of the information among the involved IM's and RU's in the ERTMS deployment domain for the ensuring of the ERTMS deployment coordination on the corridor level
- establishing the expert teams for technical tasks and setting up ad hoc groups during the life cycle of the project – if necessary
- the negotiation on technical and operational rules tasks in frame of the RFC by expert teams (ad hoc groups) on the corridor level and on the bilateral level for the specific cross border sections
- the contact to the ERTMS Users Group (EUG) for the negotiation of selected tasks for the cross corridor coordination based on MoU signed between the EUG and the ETCS Corridor E Management Committee in 2008.

### **Activities and coordination issues of the Interoperability & ERTMS WG**

- Since the beginning of the ETCS Corridor E project more bilateral technical consultations have taken place between SZDC and ZSSK Cargo, MÁV, CFR, ZSR
- 2010 - creation of "Technical Requirements for Technical Requirements for Development of ERTMS/ETCS L2 on the Czech part of Corridor E" (TR)

- 2011 - discussion of the TR with all ETCS Corridor E members and EUG, the consolidated version is put at the disposal of all corridor members
- The representatives of the ERTMS Deployment WG participated in the meeting of the Traffic Management WG held in Prague on 28th August 2012. The main discussed task was the necessity for close cooperation and good communication between both WG
- On 16th and 17th October 2012 there was a common meeting of the Czech representatives of the ERTMS Deployment WG and the ERA ERTMS Operational Feedback WP in Prague. The main discussed task was the possible harmonisation of the ETCS Operational rules and information on technical solutions used in the Czech Republic
- On 23rd November 2012 a bilateral meeting was organized between the ÖBB and the SŽDC and their ETCS suppliers so as to start the cooperation for the technical solution of the interconnection of both ETCS L2 systems in the cross border section CZ – AT
- Dates of further meetings are under discussion, the workflow is managed via e-mail correspondence.

### 5.3.2. Description of ETCS implementation on the RFC OEM

#### DE – DB Netz

At first the eastern branch of the German corridor part (Rostock – Berlin – Dresden) will be equipped with ETCS Baseline SRS 3.4.0. From Rostock Seehafen to Kavelstorf (14 km) ETCS L2 is being planned. From Kavelstorf to Nassenheide (in the north of Berlin) (168 km) ETCS L2 is under construction. The track from Nassenheide (about the eastern circle of Berlin) to Blankenfelde (in the south of Berlin) (83 km) is being planned with ETCS L1/2. On the line Blankenfelde – Dresden (156 km) ETCS L2 is under construction. Two further connecting tracks from Großenhain to Priestewitz (7 km) and in Radebeul (2 km) are being planned. For Dresden – Bad Schandau - Grenze DE/CZ the implementation of ETCS is – with regard to the EDP - foreseen after 2023.



**Table 19: Overview of the German part of RFC OEM**

**CZ - SŽDC**

The ETCS L2 trackside v. 2.3.0d on the Czech corridor south branch from the state border SK/AT – Břeclav – ČeskáTřebová – Kolín (277 km) is under construction. The completion of this section is set for the end of 2018.

The ETCS L2 trackside v. 2.3.0d on the Czech corridor north branch from the state border DE – DolníŽleb – Děčín hl.n.-Kralupy nad Vltavou (112km) is scheduled to be completed in 2023.

The ETCS L2 trackside v. 2.3.0d on the Czech corridor middle branch from Kralupy nad Vltavou -Praha Libeň-Kolín (110km) is scheduled to be completed in 2020.

The ETCS L2 trackside v. 2.3.0d on the Czech corridor Brno-H.Brod-Kolín (alternative line) (195 km) is out of time scope in the moment.

The ETCS L2 trackside v. 2.3.0d on the Czech corridor Kolín - Lysá n.L.-Ústí n. L. Střekov-Děčín-(DE) (connecting line) (160 km) is out of time scope in the moment.

GSM-R for Voice and Data transmittal is already in operation on the whole Czech part of the corridor.



Table 20: Overview of the Czech part of RFC OEM

**AT – ÖBB**

The ETCS L2 trackside v. 2.3.0d on the Austrian corridor part from the state border CZ (Břeclav) – Vienna (78 km) is in operation.

The upgrades from ETCS L1 trackside v. 2.2.2 to ETCS L2 trackside v. 2.3.0d on the Austrian corridor part from Vienna - Border HU (Hegyeshalom) (68 km) is expected to be completed in 2022.

GSM-R for Voice and Data transmittal is already in operation on the whole Austrian part of the corridor.

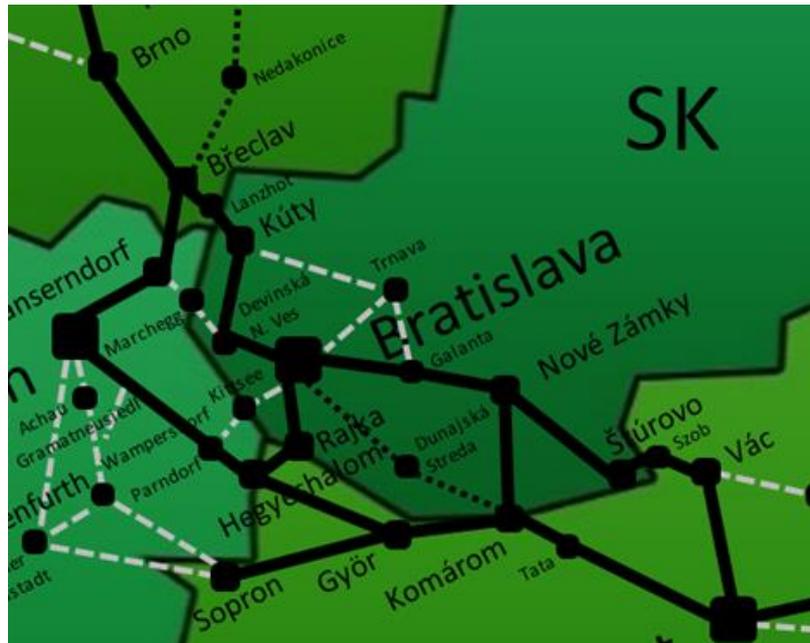


*Table 21: Overview of the Austrian part of RFC OEM*

**SK – ŽSR**

The main path of the Slovak corridor part in the sections border CZ (Breclav) - Kúty - Devinska N. Ves (58 km) and Devinska N. Ves - Junction Bratislava Rusovce – (HU Rajka) (63 km) is prepared to be equipped by ETCS L2 v. 2.3.0d. The preparatory documentation for these projects is under elaboration. The realization is expected in 2018 – 2020.

The equipment of the paths Bratislava - Nove Zamky - Sturovo – (HU Szob) (143km) and Nove Zamky - Komárno – (HU) (33km) with ETCS L2 trackside v. 2.3.0d is out of time scope in the moment. GSM-R is partly in operation (see table).



*Table 22: Overview of the slovakian part of RFC OEM*

## HU – MÁV

The section state border AT - Hegyeshalom – Budapešť (198 km) is already equipped by ETCS L1 v. 2.2.2 and in operation. An upgrade to ETCS L2 (at least 2.3.0d) is planned after 2022.

The section Budapest - Szajol - Lőkősháza – Békéscsaba (196 km) is prepared to be equipped by ETCS L2 v. 2.3.0d by 2018 .

The section Békéscsaba - Lőkősháza - (RO Curtici) (29km) is equipped with ETCS L1 v. 2.3.0d.

Budapest (Bp.-Kelenföld - Bp. Ferencváros) – the intention is to equip this part of the junction Budapest by ETCS L2 v. 2.3.0d by 2022.

## HU – GYSEV

The section Border SK - Hegyeshalom (GYSEV) is already equipped by ETCS L1 v. 2.3.0d and in operation.



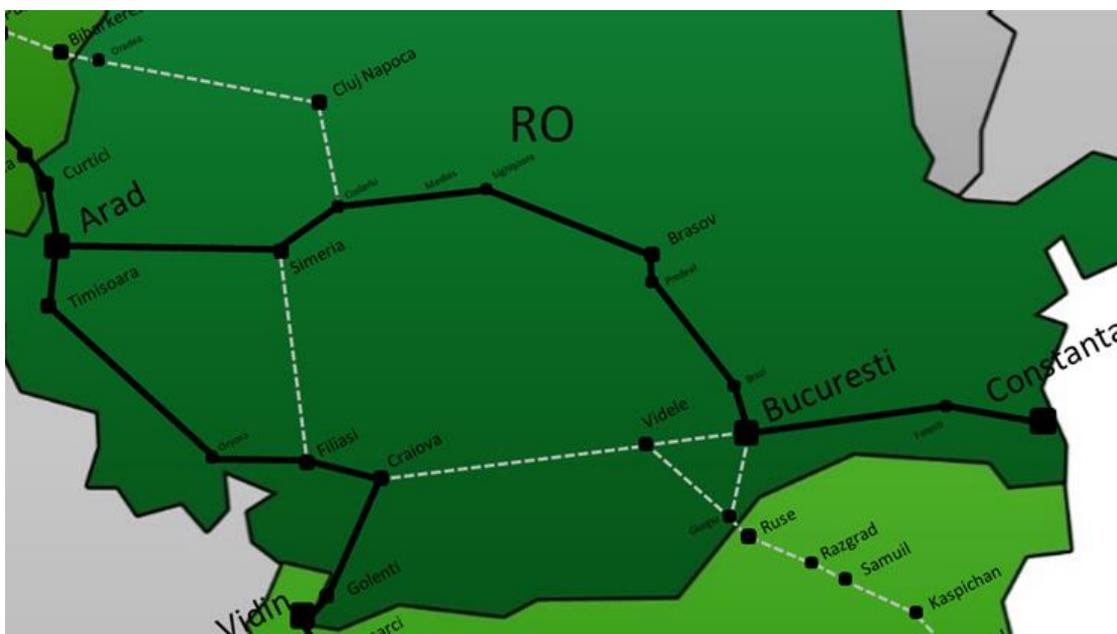
*Table 23: Overview of the hungarian (MAV and GYSEV) part of RFC OEM*

**RO – CFR**

For the section Predeal – Bucharest Băneasa (151,6 km) ETCS L2 v.2.3.0d is installed only on section Brazi - Chitila and for remaining distance feasibility study is in preparation for the installation of ETCS L1 with GSM-R or ETCS L2, planned to be completed in 2022.

The section Lököshaza – Predeal (510 km) will be equipped by ETCS L2 with minimum v. 2.3.0d step by step, the construction was started in 2012. The whole section will come into operation by 2020-2022.

The equipment of the section Bucuresti Băneasa – Constanta (217,4 km) with ETCS L1 v 2.3.0d without GSM-R, is currently under construction (mostly part of equipment's was already installed on the field, no certification and authorization for putting in operation yet) and is in preparation a feasibility study for implementing GSM-R, planned to be completed in 2022-2024.

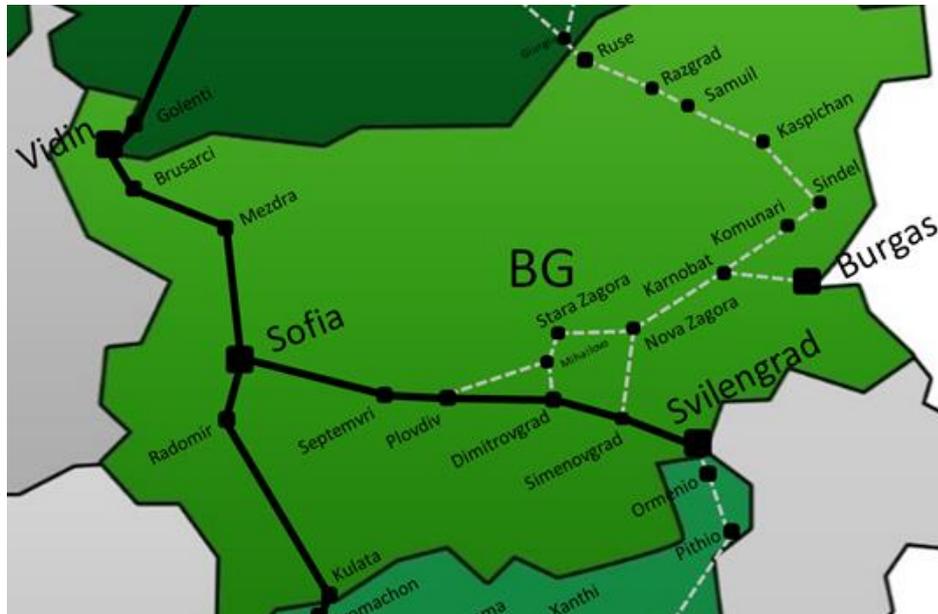


*Table 24: Overview of the romanian part of RFC OEM*

## BG – NRIC

On the section Plovdiv – Dimitrovgrad the ETCS L1 v. 2.3.0d is already installed and tested. ETCS L1 v. 2.3.0d is installed and tested along the section Dimitrovgrad – Svilengrad – Turkish/Greek borders (83 km).

The ETCS L1 v. 2.3.0d was installed and tested on the section Septemvri – Plovdiv (53 km). The operation will start -by 2018.

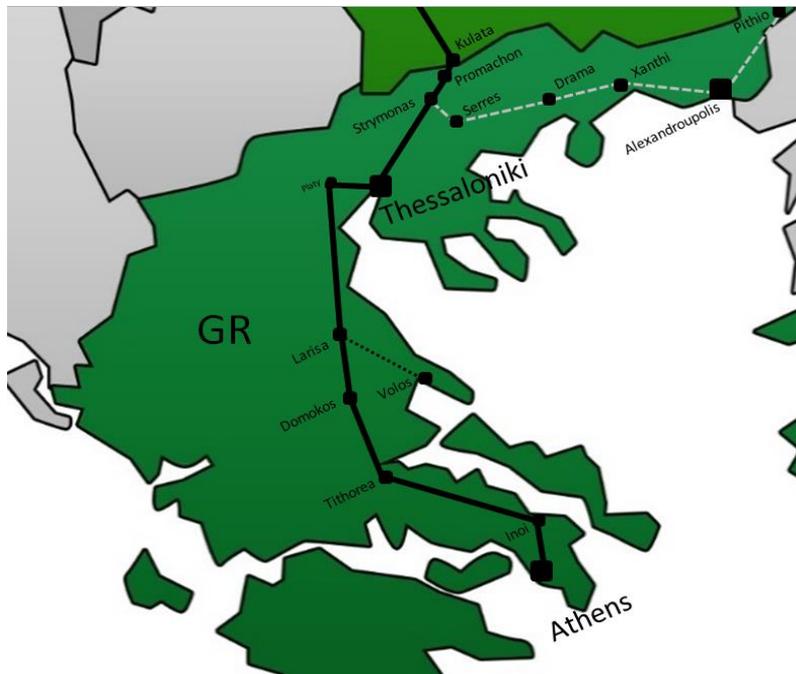


*Table 25: Overview of the bulgarian part of RFC OEM*

**GR – OSE**

ETCS L1 v. 2.3.0d is under construction on the section Thriasio – Ikonio (20 km), the commercial operation will start by 2020.

ETCS L1 v. 2.3.0d is under construction also on the section SKA - Promachonas (541 km), the commercial operation will start by 2020.



*Table 26: Overview of the Greek part of RFC OEM*

**Summary-Outlook**

This overview shows that the migration process to the ETCS trackside on the main path of the RFC OEM lines has started. There are already some sections operating with ETCS Level 1 (e.g. (AT) - Hegyeshalom – Budapest; Border SK - Hegyeshalom (GYSEV)) or Level 2 (e.g. CZ Breclav-Vienna). The main parts of the corridor are expected to be equipped with ETCS between 2020 and 2022. There is a very good chance to operate under ETCS supervision on more cross-border sections between neighbour member states by 2020 -2024.

The aim is to bring the ETCS deployment in a routine process for decreasing development works and on side testing by the exchange of experiences and the reuse of proved solutions. Then this can accelerate the deployment process and decrease the investment costs.

Detailed Information on the implementation of ETCS and GSM-R is shown in separate Annex (8).

**5.4. Reference to Union Contribution**

For the time being RFC OEM has not been involved in any EU financial contribution. In September 2017 the corridor management has applied for Program Support Action (PSA) funding. The evaluation of the bid is ongoing.