

Decision of the Executive Board of the Scandinavian-Mediterranean Rail Freight Corridor of 6 November 2015 approving the implementation plan and the investment plan of the rail freight corridor

THE EXECUTIVE BOARD OF SCANDINAVIAN-MEDITERRANEAN RAIL FREIGHT CORRIDOR,

Having regard to:

- The Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight and in particular Articles 9, 10 and 11 thereof,
- The Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU and in particular Articles 11, 12, 13 and 48 thereof,
- The Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 and in particular Article 4 thereof,
- The Directive (EU) 2008/57 of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community and in particular Article 6(6) thereof and the Commission Decision 2009/561/EC of 22 July 2009 as regards the implementation of the technical specification for interoperability relating to control-command and signalling subsystem of the trans-European conventional rail system,

Acting in accordance with its *Internal Rules of Procedure*,

Whereas:

- The Management Board shall draw up an implementation plan and submit it for approval to the Executive Board in accordance with Article 9(1) of Regulation (EU) No 913/2010,
- The Management Board shall draw up and periodically review an investment plan and submit it for approval to the Executive Board in accordance with Article 11(1) of Regulation (EU) No 913/2010,

- The Scandinavian-Mediterranean Rail Freight Corridor is interconnected from North to South with the North Sea-Baltic, Orient/Eastern Mediterranean, Rhine-Danube, Mediterranean and Baltic-Adriatic Rail Freight Corridors.

HAS ADOPTED THIS DECISION,

Article 1

The Implementation Plan for Scandinavian-Mediterranean Rail Freight Corridor as submitted by the Management Board is approved as laid down in the Annex.

The Investment Plan for Scandinavian-Mediterranean Rail Freight Corridor as submitted by the Management Board, and included in the Implementation Plan in accordance with Article 9(d) and 11 of Regulation (EU) No 913/2010, is approved as laid down in Chapter VI of the Annex.

The Executive Board adds a statement regarding the importance of ERTMS as laid down in Chapter XIII of the Annex.

Article 2

This decision will enter into force the day after its adoption by the Executive Board.

Article 3

This decision is addressed to the Management Board of the Scandinavian-Mediterranean Rail Freight Corridor.

Done at Copenhagen on 6 November 2015.

For the Executive Board of the Scandinavian-Mediterranean Rail Freight Corridor
The chairman



Hans Christian WOLTER

ANNEX

Scandinavian – Mediterranean Rail Freight Corridor

Implementation Plan



Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Version Management

Date (Hour)	Changed made by	Organisation	Summary of changes
29.06.2015	Sophie Ismaier	Coordination Group	
07.09.2015	Lars Stenegard	ScanMed RFC	VII 6.2 deleted, ERTMS text included
02.10.2015	Lars Stenegard	ScanMed RFC	Post 23 rd ExB meeting comments inserted and crosscheck footnotes
06.10.2015	Lars Stenegard	ScanMed RFC	Final Statement of the ExB on the issue of ERTMS included
22.10.2015	Lars Stenegard	ScanMed RFC	Final

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I. List of abbreviations

B3	System Requirement Specification Baseline 3
CER	Community of European Railways
CID	Corridor Information Document
CIP	Customer Information Platform
CNC	Core network corridors
C-OSS	Corridor One-Stop-Shop
CR	Conventional rail
DG MOVE	Directorate General Mobility and Transport
D/R	Development and Review
HGV	Heavy Goods Vehicle
EC	European Commission
ERA	European Rail Agency
ERTMS	European Rail Traffic Management System
ETCS	European Train Control System
ETISPlus	European Transport Information System Plus ¹
EU	European Union
ExB	Executive Board
GSM-R	Global System for Mobile communication – Railway
IM	Infrastructure Manager
IWW	Inland Waterways
KPI	Key Performance Indicator
MB	Management Board
MoS	Motorways of the Sea
NUTS 2 /3	Nomenclature of Units for Territorial Statistics – Level 2 and Level 3 ²
O/D	Origin and Destination
PaP	Pre-arranged Train Path
PCS	Path Coordination System
PESTL	Political, Economic, Social, Technical and Logistical Analysis
RAG	Railway Advisory Group
RFC	Rail Freight Corridor
RNE	RailNetEurope
RU	Railway Undertaking
SERAC	Single European Rail Area Committee
SRS	System Requirement Specification
SWL	Single Wagon Load
SWOT	Strength, Weaknesses, Opportunities and Threat Analysis
TAF/TSI	Technical Specification for Interoperability of Telematic Application for Freight
TAG	Terminals Advisory Group
TEN-T	Trans-European Network for Transport
TIS	Train Information System
TMS	Transport Market Study
TSI	Technical Specification for Interoperability
WG	Working Group

¹ <http://www.etisplus.eu/default.aspx>

² http://ec.europa.eu/eurostat/c/portal/layout?p_l_id=629283&p_v_l_s_g_id=0

II. Introduction

II.1. Legal Background

The legal basis of the Scandinavian Mediterranean RFC (hereafter “ScanMed RFC”) consists of Regulation (EU) No 913/2010, Art.48 of Regulation (EU) No 1315/2013 and Art.29 of Regulation (EU) No 1316/2013 and Directive 2012/34/EU:

- **REGULATION (EU) No 913/2010 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 September 2010 concerning a European rail network for competitive freight;**

Aim of the Regulation (EU) No 913/2010 is to foster the efficiency of international rail freight by creating conditions under which “freight trains can (...) easily pass from one national network to another.”³ It encloses such measures as the publication of coordinated pre-arranged international train paths, the set-up of a corridor one-stop-shop to facilitate access of the customer to these paths, and a better coordinated traffic management.

In its Annex, this Regulation originally defined nine initial freight corridors to be taken into operation in November 2013 or 2015 and enclosed a Rail Freight Corridor 3 “Stockholm – Malmö-Copenhagen-Hamburg-Innsbruck-Verona-Palermo” as one of these nine initial freight corridors.

- **REGULATION (EU) No 1315/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on Union Guidelines for the development of the Trans-European Transport Network and repealing Decision No 661/2010/EU;**

Aim of Regulation (EU) No 1315/2013 is to update the frame of TEN-T policy by moving from individual priority projects to a two-layer network approach composed of a comprehensive network and of a core network – the latter being a subpart of the former. Within the core network, major multimodal axes were distinguished on basis of their utmost European importance. These axes, understood from an EU-perspective as the backbone of a Trans-European Transport Network, were given as from 2014 specific attention in terms of EU-co-funding. Correlatively, they were given individual governance under the concept of “core network corridors” (CNC).

Unlike RFCs, which focus on operational measures, CNCs are strongly focused on infrastructure planning and investment. However, duplication of activity is to be avoided, as RFCs and CNCs are meant to coordinate their works⁴.

- **REGULATION (EU) No 1316/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010;**

Regulation (EU) No 1316/2013 is the financial component of the updated TEN-T policy frame. It further encloses the principle of “aligning” RFCs to CNCs. By this is meant that:

- a Core network corridor corresponds only to one RFC and vice versa;
- RFCs will be prolonged in order to make both RFC and CNC maps more consistent with one another

Based on these principles, Regulation (EU) No 1316/2013 amended the Annex to Regulation (EU) No 913/2010. As a consequence, ScanMed RFC was extended to Oslo, Trelleborg, La Spezia,

³ Recital 5 of the introduction to Regulation (EU) No 913/2010

⁴ S. Art.48.1 of Regulation (EU) No 1315/2013

Livorno, Ancona, Taranto and Augusta. Entry into operation of the extensions is due until 3 years after establishment according to the original timetable, i.e. until 10th November 2018, at the latest.

▪ **DIRECTIVE 2012/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 November 2012 establishing a single European railway area;**

Also referred to as the Recast of the First Railway Package, Directive 2012/34/EU lays down the rules applicable to the management of railway infrastructure and to rail transport activities, sets the criteria applicable to the issuing, renewal or amendment of licenses by a Member State intended for railway undertakings which are or will be established in the Union as well as it sets the principles and procedures applicable to the setting and collecting of railway infrastructure charges and the allocation of railway infrastructure capacity.

II.2. Aim of the Implementation Plan

According to Art.9 of Regulation (EU) No 913/2010, the Implementation Plan shall present all measures and steps taken to establish ScanMed RFC until 10th November 2015. It defines core concepts and updates corridor customers as well as the EU-Commission and the Ministries in charge of transport on the frame in which the corridor is planned to go live.

In particular, the Implementation Plan encloses:

- a description of the characteristics of the freight corridor, including bottlenecks,
- the essential elements of the Transport Market Study,
- the objectives for the freight corridors, in particular in terms of performance of the freight corridor expressed as the quality of the service and the capacity of the freight corridor,
- the indicative investment plan,
- the measures to implement the provisions of Articles 12 to 19 of Regulation (EU) No 913/2010.

The Implementation Plan is reviewed and updated regularly.

II.3. General Objectives of ScanMed RFC

In the spirit of Regulation (EU) No 913/2010, the ultimate objective of which is to foster the competitiveness of rail freight, the Executive Board defined general objectives of ScanMed RFC⁵, which read as follows:

- **Corridor vision:**
 - A well performing competitive corridor with seamless service and end to end control of train movements and wagons
- **Quality objectives:**
 - Integrated service planning with expedient service to applicants
 - Coordinated traffic management will ensure operation in line with timetable
 - Harmonized and user-friendly customer IT interfaces to allow end to end control
- **Capacity objectives:**
 - Supply of high-quality train paths in line with market demand
 - Good interoperability and operational compatibility to increase commercial speed, pay-load and efficiency

⁵ S. Annex II

- Systematic mitigation of bottlenecks, in particular at national and system borders
- **Availability objectives:**
 - Planned capacity available to applicants/users
 - Systematic contingency handling of recurrent causes for delays
 - Aligned business concept with terminals

For the monitoring of these General Objectives, Key Performance Indicators (KPIs) are defined and explained in Chapter VII of the present document.

III. General Characteristics of ScanMed RFC

III.1. Corridor description

III.1.1. Corridor Routing

Definitions

Following Art.2.2.a of Regulation (EU) No 913/2010, ScanMed RFC consists of all **designated railway lines**, including the infrastructure and its equipment, that connects two or more terminals along principal and, where necessary, diversionary lines. The network of principal and diversionary lines builds up the **corridor routing**.

Principal lines designate those sections of the corridor routing on which Pre-arranged train paths are offered. Principal lines connect together at least the nodes mentioned in the Annex of Regulation (EU) No 913/2010, and may connect the extensions as from November 2018 at the latest.

Diversionary lines designate those sections on which corridor trains may temporarily be re-routed, for e.g. in case of traffic disturbances or of works affecting capacity on principal lines. Pre-arranged paths are in principle not offered on diversionary lines. Specific circumstances, for e.g. works of longer duration, may however lead to exceptionally offer Pre-arranged paths on diversionary lines as well.

Expected lines designate those sections that are either secured or under construction, for this reason yet or entirely in service but planned to be taken as part of the routing of ScanMed RFC after their entry into operation.

ScanMed relevant terminals designate the installations provided along the freight corridor specially arranged to allow either the loading and/or the unloading of goods onto/from freight trains, and the integration of rail freight services with road, maritime, river and air services, and either the forming or modification of the composition of freight trains⁶.

Feeders and outflow paths are paths with which Corridor trains are either brought from their origin to the Rail Freight Corridor (feeder) or from Rail Freight Corridor to their destination (outflow path).

Corridor trains designate trains running on a path crossing at least one corridor border and allocated by the C-OSS.

Corridor borders designate border-crossing points between two countries located on a line of the Corridor.

Crossing points designate those nodes where two or more RFCs join or cross each other. A crossing point may or may not be associated to overlapping sections.

⁶ Art.2.2.c of Regulation (EU) No 913/2010

Overlapping sections are those sections which are common between ScanMed RFC and another RFC.

The total routing of ScanMed RFC by 10th November 2015 amounts 7.527 km and is split as follows:

Country	Principal lines (km)	Diversiory lines (km)	Total (km)
Norway	175	/	175
Sweden	1.183	174	1.357
Denmark	350	/	350
Germany	1.090	910	2.000
Austria	111	/	111
Italy	3.272	262	3.534
Total	6181 (82,1%)	1.346 (17,9%)	7.527

Table 1: Routing split of ScanMed RFC

ScanMed RFC as of entry into operation (10. November 2015)

ScanMed RFC will be taken on operation including the extensions to Oslo, Trelleborg, Ancona, Taranto, Augusta, Livorno and La Spezia foreseen in Regulation (EU) No 1316/2013. The Fehmarnbelt section København – Rødby – Puttgarden – Lübeck will be taken as principal line after entry into operation of the Fehmarnbelt Fixed Link. Until then, ScanMed RFC will run on the section København – Padborg - Flensburg. The section Hamburg – Lübeck (Skandinavien Kai) and Malmö-Trelleborg will however be included as diversionary line as from entry into operation.

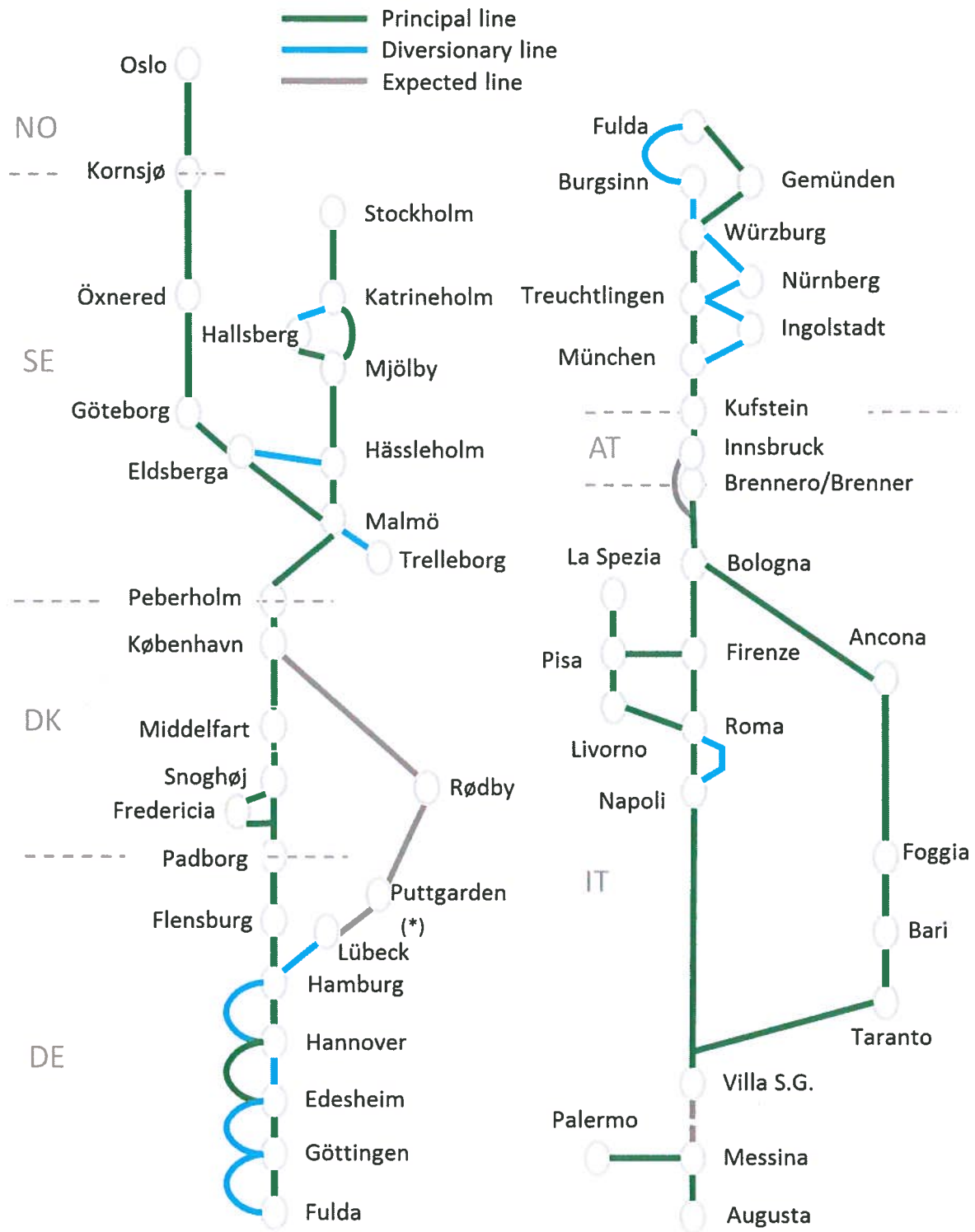


Figure 1: Routing scheme of ScanMed RFC
 (*= connection today as railway ferry)

Based on the results of the first Transport Market Study (s. Chapter 2), ScanMed relevant terminals are the following⁷:

Country	Name	Place
NORWAY	Freight Terminal Alnabru	Oslo
	Oslo Havn	
	Rail Terminal Drammen	Drammen
	Drammen Nybyen	
	Drammen Havn	
	Port of Halden	Halden
	Moss Havn	Moss
	Borg Havn	Gamle Frederikstad
	Larvik Havn	Larvik
	Grenland Havn	Brevik/Langesund
SWEDEN	Göteborg Hamn	Göteborg
	Göteborg Sävenäs Rangerbangård	
	Göteborg Norra Kombiterminal	
	Norrköping Hamn	Norrköping
	Copenhagen Malmö Port	København/Malmö
	Helsingborg Hamn	Helsingborg
	Helsingborg Kombiterminal	
	Halmstad	Halmstad
	Malmö Intermodal Terminal	Malmö
	Malmö Gbg	
	Stockholm Årsta Intermodal Terminal	Stockholm
	Hallsbergs Terminal AB	Hallsberg
	Hallsberg Rangerbangård	
	Katrineholm Rail Point	Katrineholm
	Nässjö Kombiterminal	Nässjö
	Godsterminal Gamlarp	
	Älmhult	Älmhult
DENMARK	Combiterminal Høje Taastrup	Taastrup
	Combiterminal Taulov	Fredericia
	Combiterminal Padborg	Padborg
	Kolding Port	Kolding

⁷ The list displayed in the present document is indicative and expected to be regularly updated.

	Ro-Ro Terminal Fredericia	Fredericia
	Aarhus Havn	Aarhus
	Ringsted	Ringsted
	Glostrup	Glostrup
GERMANY	Container Terminal Lübeck Skandinavienkai	Lübeck
	DUSS Terminal Hamburg-Billwerder	
	Container Terminal Altenwerder (CTA)	Hamburg
	Container Terminal Burchardkai (CTB)	
	Container Terminal Tollerort (CTT)	
	Eurogate Container Terminal Hamburg	
	Hamburg Port Authority (HPA)	
	Hansaport	Waltershof
	Maschen Rbf	Maschen
	Seelze Rbf	Seelze
	Lehrte	Lehrte
	DUSS-Terminal Hannover-Linden	Hannover-Linden
	Ingolstadt Hbf.	Ingolstadt
	Ingolstadt-Nord	
	DUSS-Terminal München-Riem	München
	München Nord	
	München Ost	
	Nürnberg Rbf	Nürnberg
	TriCon Container-Terminal Nürnberg GmbH	
AUSTRIA	Hall in Tirol Container-Terminal	Hall in Tirol
ITALY	Interbrennero	Trento
	Porto della Spezia	La Spezia
	Porto di Ancona	Ancona
	Porto di Livorno	Livorno
	Terminale Italia	
	Porto di Napoli	Napoli
	Bologna Interporto	Bologna
	Terminale Italia	
	Consorzio ZAI	Verona
	Terminale Italia	

Porto di Gioia Tauro	Gioia Tauro
Porto di Bari	Bari
Terminale Italia	
Inteporto Regionale della Puglia (IRP)	
SGT	Pomezia
Terminale Italia	Maddaloni
Interporto Sud Europa	
Porto di Taranto	Taranto
Porto di Augusta	Augusta
Area Sviluppo Industriale di Catania (ASI)	Catania
Terminale Italia	
Terminale Italia	Roma
Porto di Palermo	Palermo

Table 2: ScanMed RFC Terminals and Ports

III.1.2. Overview of infrastructure parameters

A detailed overview of the infrastructure parameters on ScanMed RFC is included in Annex VIII. The line sections building up the routing of ScanMed RFC fulfill the standards of Regulation (EU) No 1315/2013 as follows, in percentage of the national corridor lines and, in parentheses, in percentage of the national principal lines:

	Max. Gradient (12,5/1000)		Intermodal Freight Code (P/C80- P/C400)	Siding length (740m)	Axle load (22.5 t)	Meter load (8 t/m)	Line speed (100km/h)	Electrif.	ERTMS
	N-S	S-N							
NO	84 (84)	84(84)	100 (100) ⁸	16 (16)	96 (96)	96	96 (96)	100(100)	0(0)
SE	68,5 (76,4)	68,3 (76,1)	100 (100) ⁹	14,2 (16,3)	100 (100)	5,5 (6,3)	100 (100)	100(100)	0(0)
DK	93,3 (93,3)	93,3 (93,3)	100 (100)	100 (0)	100 (100)	100 (100)	100 (100)	100(100)	0(0)
DE	73,1 (67,1)	73,1 (67,1)	73,3 (51,1)	0 (0) ¹⁰	100 (100)	93,6 (88,2)	100 (100)	100(100)	0(0)
AT	67,6 (67,6)	67,6 (67,6)	100 (100) ¹¹	0 (0) ¹²	100 (100)	100 (100)	100 (100)	100(100)	88,4 (88,4)
IT	56,3 (60,8)	78 (84,3)	15,7 (17,0) ¹³	0 (0) ¹⁴	70,1 (75,7)	70,1 (75,7)	100 (100)	100(100)	0 (0)

⁸ P/C410 only

⁹ P/C80 only. The full standard, i.e. P/C80 and P/C410 is fulfilled on 2% of the corridor national lines (2,3% of the national principal lines).

¹⁰ The maximum siding length in Germany is 720m, between Flensburg and Fulda via Hamburg (Principal line) as well as between Maschen and Göttingen

¹¹ P/C80 only

¹² The maximum siding length in Austria is 650m between Kufstein and Brennero (Principal line)

¹³ P/C80 only

¹⁴ The maximum siding length in Italy is 610m between Rimini and Ancona (Principal line)

Table 3: Percentage of ScanMed RFC routes fulfilling TEN-parameters

III.2. Crossing points, overlapping sections and shared stretches

From the North to the South, ScanMed RFC will cross, at the date of his entry into operation in November 2015:

- the North Sea – Baltic RFC the area of Hannover
- the Mediterranean RFC in the area of Verona

By 2015, ScanMed RFC will cross the North-Sea – Baltic RFC in the area of Hamburg and will share with it an overlapping section between Hamburg and Uelzen. Further details are provided in Book 4 of the Corridor Information Document.

By 2018, ScanMed RFC is planned to cross the Orient/Est Med RFC at least in the area of Hamburg.

By 2020, ScanMed RFC is planned to cross the Rhine-Danube RFC in the area of Würzburg and in the area of Munich.

ScanMed RFC is connected to adjacent corridor concepts:

- ERTMS Corridor B “Stockholm – Naples” defined by Commission Decision 2009/561/EC of 22 July 2009 is partly aligned with ScanMed RFC. Activities related to it were taken in April 2012 into the scope of action of the then Rail Freight Corridor 3¹⁵. This aspect remains unchanged after entry into operation of Regulation (EU) No 1315/2013 and Regulation (EU) No 1316/2013.
- ScanMed RFC is partly aligned with multimodal Core Network Corridor Scandinavian-Mediterranean¹⁶, a detailed qualification of which is available in the Corridor Study coordinated by the European Commission¹⁷
- As from 10th November 2015, RFC 3 is expected to supplant RNE C01 and RNE C04.

IV. Organization of the ScanMed RFC

IV.1. Governance Structure

IV.1.1. Regulation requirements

- The **Executive Board** was set up on 8th June 2012 on the basis of the Executive Committee of ERTMS Corridor B¹⁸. It is composed of representatives of the authorities in charge of transport of Norway, Sweden, Denmark, Germany, Austria and Italy. The Chair of the Management Board, the leader of the Coordination Group as well as representatives of regulatory bodies, national safety agencies, Directorate General Mobility and Transport, DG MOVE, and the EU-Coordinator for the Scandinavian-Mediterranean Core Network Corridor, CNC, are invited to attend the meetings of the Executive Board with an observer status.

The responsibilities of the Executive Board are defined in Art.8.1. of Regulation (EU) No 913/2010. The competences of the Executive Board are further elaborated in the Mission Statement¹⁹. In particular, the tasks of the Executive Board consist of:

¹⁵ S. Art.2.b and Art.4.c. of the Agreement on the establishment of the Management Board of Rail freight Corridor 3 (S. Annex III)

¹⁶ S. Recital 16 of Regulation (EU) No 1316/2013, in: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:348:0129:0171:EN:PDF>

¹⁷ http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/corridor-studies_en.htm

¹⁸ S. Annex I

¹⁹ S. Annex I

- Defining the general objectives of the freight corridor and re-drafting when deemed necessary,
- Supervising and taking the following measures:
 - deliver an opinion upon request of the Terminal Advisory Group (TAG) to contribute solving a disagreement with the Management Board (MB),
 - approve the Implementation Plan and the indicative Investment Plan,
 - Defining a framework for the allocation of the infrastructure capacity on the RFC and redrafting when deemed needed.
 - and inform the EU-Commission every second year on the state of realization of the implementation plan
- The **Management Board (MB)** was set-up on 30th August 2012²⁰. It is composed of representatives of the Infrastructure Managers involved, i.e. Jernbaneverket (Norway), Trafikverket (Sweden), the Øresundsbro Konsortiet (Sweden/Denmark), Banedanmark (Denmark), DB Netz AG (Germany), ÖBB Infrastruktur AG (Austria), Rete Ferroviaria Italiana S.p.a (Italy). The Management Board decides unanimously. Its competences are defined in Art. 8.2. of Regulation (EU) No 913/2010. They consist in particular in:
 - Setting-up the Railway undertaking Advisory Group (RAG) and the TAG,
 - Coordinating the use of IT-applications in accordance with national and European deployment plans to handle requests for international train paths and the operation of international traffic on the freight corridor,
 - Delivering the Implementation Plan
 - Preparing and deciding on the following measures:
 - Definition of processes for the consultation of applicants,
 - Delivery of an Investment Plan,
 - Definition of coordinated information processes on works,
 - Set-up of a C-OSS
 - Joint definition of Pre-arranged paths, of reserve capacity and promotion of the coordination of priority rules relating to the allocation of corridor capacity
 - Definition of procedures for coordinating traffic management along the freight corridor
 - Definition of guidelines for coordinating traffic management in case of disturbances,
 - Delivery of a Corridor Information Document
- The **Advisory Groups**, i.e. the RAG and the TAG of the Scandinavian-Mediterranean RFC were set-up on 4th June 2013 in Munich. It is composed of representatives of RUs and Terminals, the activities of which are likely to be impacted by the establishment of the RFC.

The cooperation framework between the MB on the one hand and the TAG and the RAG on the other hand are added in Annex IV.

IV.1.2. Additional cooperation

- In the **preparation phase** and in order to fulfill all Regulation requirements, the Management Board developed an **internal cooperation structure** at level of project managers and experts. This structure consists of working groups and of a coordination group.

²⁰ See Annex III

- The **working groups**, each composed of an expert per Infrastructure Manager (IM) involved with the exception of the Øresundsbros Konsortiet, represented by Trafikverket, are:
 - **Transport Market Study**: set up in May 2012 and in charge of conducting the Transport Market Study (TMS). The working group completed its activities in August 2014
 - **OSS/Capacity Management**: set-up in October 2012 and in charge of developing common solutions for implementing Art.12, 13 and Art.14 of Regulation (EU) No 913/2010, as well as to contribute to defining common solutions for Art.12 and to the Corridor Information Document; due to the need of specific expertise in Network Statements not represented in the WG OSS/Capacity Management, a subgroup was set-up in February 2014 to deliver the first Corridor Information Document (CID). For the same reason, a subgroup Possessions was established in March 2014 to deliver a corridor proposal for implementing Art. 12.
 - **Traffic and Performance Management**: set-up in January 2013 and in charge of developing common solutions for implementing Art.16, Art.17 and Art.19 of Regulation (EU) No 913/2010,
 - **Infrastructure**: set-up in July 2013 and in charge of preparing the Investment plan and the description of infrastructure parameters and bottlenecks along the corridor; the working group completed its activities in September 2014.
 - **Interoperability**: set-up in December 2013 and in charge of delivering, in close cooperation with the WG Infrastructure, the plan for the implementation of interoperable systems; the working group completed its activities in May 2014.
- A **Coordination Group**, composed of project managers from the IMs involved with the exception of the Øresundsbros Konsortiet, represented by Trafikverket, consolidates, whenever required, the input of the working groups. The Coordination Group further supervises the timely implementation of the Corridor Project plan, prepares meetings of the Management Board as well as of the Advisory groups and fulfills all necessary transversal tasks such as preparing EU-submissions for funding or drafting a Communication Plan. The Coordination Group completed its activities in September 2015.
- For the **operational phase**, the Management Board has agreed on a lean structure, consisting in:
 - The **Managing Director**, responsible for the overall corridor management and development, and for representing ScanMed RFC towards third parties. The Managing Director acts upon mandate of the Management Board.
 - The **Project Manager**, responsible for coordinating the working groups, for ensuring timely delivery, the regular update of documents and reports of the corridor and for representing the corridor in cross-corridor working groups. The Project Manager reports to the Managing Director.
 - The **Corridor One Stop Shop (C-OSS)**, responsible for fulfilling the tasks foreseen in Art.13 of Regulation (EU) No 913/2010. The C-OSS Manager makes decisions on the allocation

of PaPs and Reserve Capacity, promotes the Corridor and gathers relevant information for further quality and performance monitoring.

The Corridor Staff works together with **Program Implementation Managers** appointed by the involved Infrastructure Managers to represent them for the day-to-day Corridor Management.

The Management Board will further set-up **expert working groups and subgroups** on an *ad hoc* basis aiming at updating, adapting and/or upgrading the corridor deliverables and offer. These working groups will in particular focus on the update of the Corridor Information Document, including the Implementation and the Investment Plan, on the regular update of the Transport Market Study, on Traffic and Performance Management, on the Capacity Management, including the handling of information on works and possessions.

In order to set a stable frame for common action, ScanMed RFC is to be organized in an **Association of Austrian law**.

- In addition, ScanMed RFC has been involved in the preparation phase in **cross-corridor instances**. The RFCs coordinate together, as well as with the European Association of Infrastructure Managers, RailNetEurope (RNE), in order to generate a network effect among themselves. Such coordination results from two concordant groups:
 - **RFC Club meetings** take place three to four times a year and bring together chairs of the Management Boards of the nine original RFCs as well as their Managing Directors or Project Coordinators. The RFC Club was initiated in April 2014 to foster compatible solutions for issues mutually identified as of primary and general interest for seamless operations on the RFCs conceived as a network.
 - **RNE-RFC high level groups** take place three to four times a year in combination with the RFC Club. It brings together RNE and representatives from the RFCs. Aim of these meetings are to share and benchmark implementation experiences of RNE IT-Tools PCS (Path Coordination System) and TIS (Train Information System) to discuss the content of the RNE Guidelines for the implementation of Regulation (EU) No 913/2010 and to prepare common solutions to issues of common interest raised by the RFC Club.

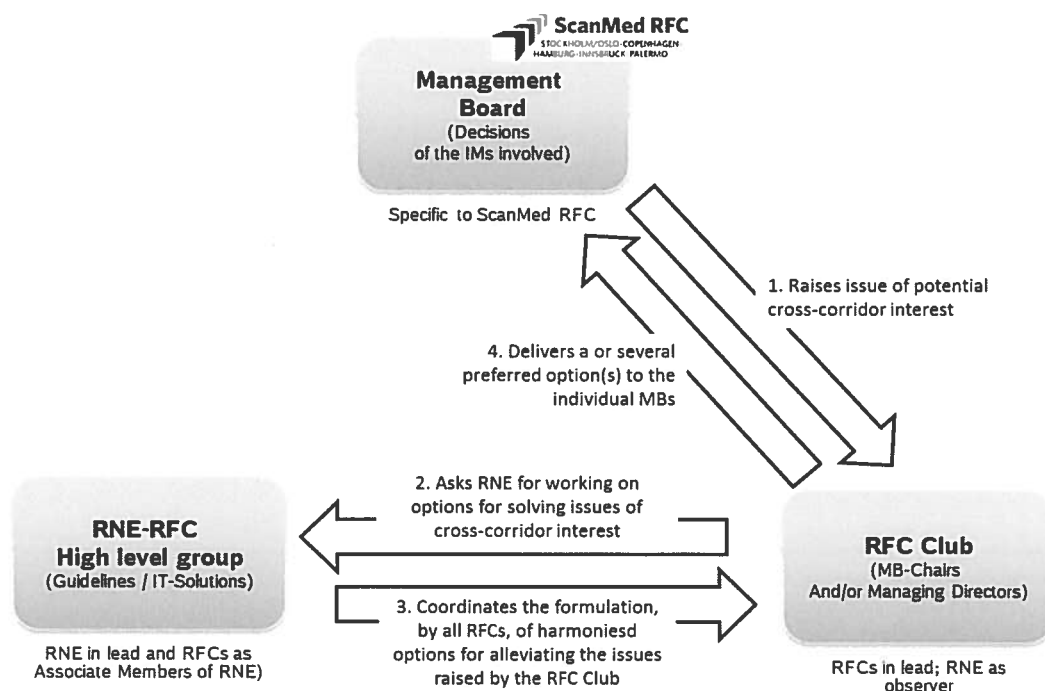


Figure 2: Coordination of the RFCs – Schematic view

IV.1.3. Co-ordination at EU-level

At EU-Level, the RFCs are invited to share their state of implementation and best practices as well as raise questions of legal interpretation or any matters of interest towards the European Commission. This exchange of views occurs in three groups:

- The Corridor Group takes place 3 to 4 times a year and is chaired by EU-Coordinator for ERTMS and RFCs, Mr. Karel Vinck. The Corridor Group brings together representatives from the Management Boards, from the Executive Boards and representatives from the EU-Commission. Aim of the meetings is to share and benchmark implementation experiences as well as to receive a feedback with respect to the requirements of Regulation (EU) No 913/2010.
- The IMs are invited twice a year to attend a meeting of the **SERAC²¹ Working Group on Rail Freight Corridors**. The common session with IMs is an opportunity to be updated on the EU Commissions views on the ongoing implementation of the RFCs.
- ScanMed RFC is regularly invited to the **Corridor Forum** for the implementation of the multimodal **TEN-T Core Network Corridor Scandinavian – Mediterranean**. Although this Corridor is primarily focused on infrastructure investments and their European co-funding, ScanMed RFC is also given the opportunity to comment studies and working documents, to the extent that their scope and objective overlap with that of the RFC.

IV.2. Communication

IV.2.1. General Approach

Communication within ScanMed RFC covers three kind of flows:

- **Flows between the Executive Board and the Management Board** are continuous.²² Meetings of the Executive Board take place four times in a year. Whereas the Management Board receives agendas and minutes for all meetings of the Executive Board, the Chairman of the Management Board as well as the Leader of the Coordination Group attend and report on the state of development of ScanMed RFC in the field of competences of the Infrastructure Managers.
- **During the preparation phase, flows between the Boards and the Advisory groups** have taken place principally during the meetings of the Advisory Groups Railway Undertakings and Terminals, which occur twice a year. Regional Reliability Groups (s. Paragraph VII.1.2) are an additional occasion to consult with RUs in the specific field of Punctuality and Performance Monitoring. **In the operational phase, the consultation between the boards, the Advisory Groups and the Applicants** will be organized as followed, using ScanMed RFC's communication tools (s. Paragraph IV.2.2.):

²¹ Single European Railway Area Committee

²² See Annex XV on the Cooperation Framework for the Executive Board and Management Board.

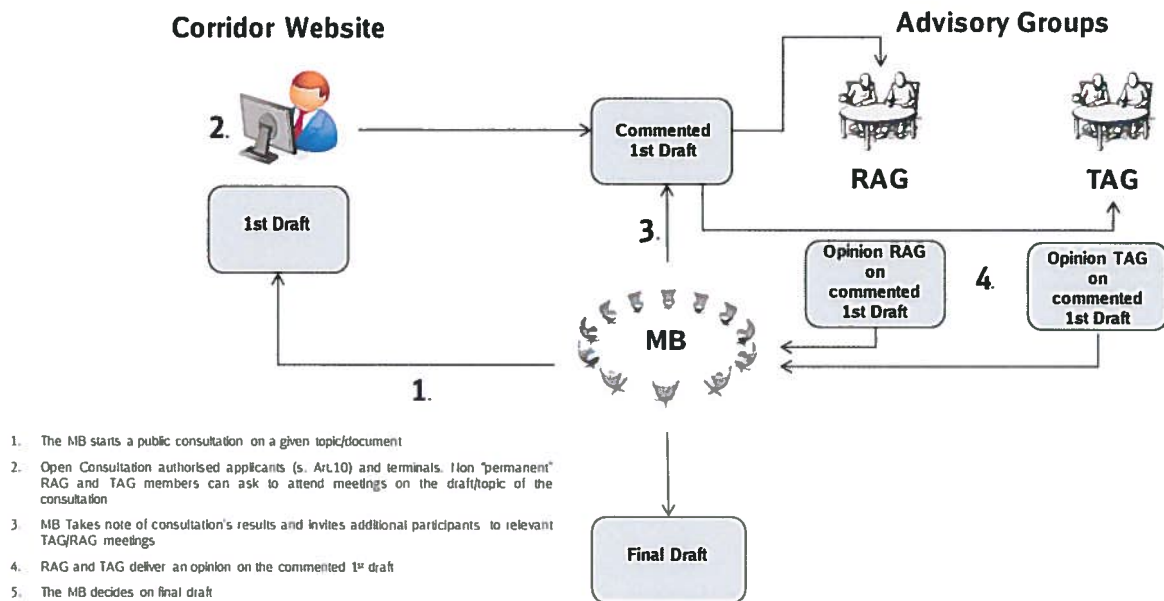


Figure 3: Consultation flows of the Advisory groups and the Applicants

- Flows between the Boards and third parties²³ include the exchange of information, at regular meetings, with the SERAC Working Group on Rail Freight Corridors, the Corridor Group chaired by EU-Coordinator Mr. Karel Vinck, the Corridor Forum for the implementation of the TEN-T Core Network Corridors, RailNetEurope and the other RFCs in the frame of the RFC Club (s. Paragraph IV.1.2.)

IV.2.2. Communication tools

ScanMed RFC will use three communication tools:

- A website as portal, accessible under the address <http://www.scanmedfreight.eu> or <http://www.scan-med-rfc.eu> : this address leads until launch of a permanent website to a temporary corridor information webpage hosted by Banedanmark.

The permanent website will provide general updates on Rail Freight Corridors and the ScanMed RFC, as well as a link to its C-OSS,

- A Customer Information Platform (CIP), accessible either through the website or directly: the platform aims at providing customers and stakeholders with:
 - an interactive map providing detailed information on routing (e.g.: principal, diversionary and connecting lines), terminals, infrastructure parameters per section relevant for rail freight traffic (e.g.: section length, intermodal freight code, interoperability gauge, line category, multinational gauge)
 - a publication area in which all corridor relevant documents, at first place the Corridor Information Document, will be easily accessible. Detailed information on the C-OSS, Terms and Conditions, the Investment Plan, Traffic and Performance Management and the Transport Market Study will be stored in this area.

²³ As provided in Art.9(5) of Regulation (EU) No. 913/2010, ScanMed RFC may in future develop a dialogue with regional and/or local administration in respect of the Implementation Plan.

V. Essential Elements of the Transport Market Study

As an essential part of the implementation plan for the freight corridor a Transport Market Study (TMS) has to be carried out according to Article 9.3 of the Regulation (EU) No 913/2010. A cost-benefit analysis has not been carried out for this first Implementation Plan. It may however be conducted together with future updates when, beyond the implementation of the requirements included in Regulation (EU) No 913/2010, the costs and revenues in relation with ScanMed RFC will be reliably measurable.

V.1. Objectives of the TMS

The main objective of the TMS is to provide the Member States and the Infrastructure Managers in ScanMed RFC as well as other stakeholders with a detailed analysis of the freight market development and future customer demand on the corridor. As a part of the implementation plan for the ScanMed RFC it supports the definition of a corridor offer, tailored to meet the expectations of customers. In order to achieve these goals the study focuses on the following major issues:

- Analysis and evaluation of the present transport market situation covering all transport modes
- Forecast of transport market developments based on an analysis of socio-economic trends
- Analysis of strengths, weaknesses, opportunities and threats of rail freight traffic on the corridor
- Recommendations for operational and organisational improvements of rail freight traffic
- Support of the definition of parameters for corridor capacity

To obtain an insider's view of the specific interests, opinions and development trends of stakeholders operating within the corridor, 57 personal interviews using an extensive questionnaire and 80 web-based surveys were carried out in the corridor countries. These interviews with the stakeholders, including railway operators, terminal and port operators, road carriers and shipping companies, forwarders and logistics providers, authorities as well as shippers, helped to

- understand the customers' requirements and future market demand
- analyse the criteria for choice of the transport mode and define the main parameters for the attractiveness of the different modes
- evaluate the future transport market development
- define measures and recommendations to facilitate rail freight traffic, and
- amend, verify and consolidate statistical data and information

V.2. Catchment area

The catchment area was defined taking into account the extensions introduced in Annex 2 of Regulation (EU) No 1316/2013 and consists of the NUTS 2 or NUTS 3 regions surrounding a reference routing derived from the Corridor nodes, as listed in Annex 2 of Regulation (EU) No 1316/2013.

Based on the reference routing the following border crossings have been identified within ScanMed RFC:

- Norway - Sweden: Kornsjø
- Sweden - Denmark: Malmö / Kastrup, Peberholm
- Denmark - Germany: Padborg / Flensburg
- Germany - Austria: Kiefersfelden / Kufstein

- Austria - Italy: Brenner/Brennero



Figure 4: Catchment area of the Transport Market Study

V.3. Analysis of current freight transport market

Eurostat, the ETISPlus database²⁴ as well as national and regional statistic sources were used for information collection of a general, i.e. non-specifically corridor-related nature (s. paragraph V.4.1.). Corridor traffic (s. paragraph V.4.2) was assessed using train data information delivered by the IMs involved in the ScanMed RFC. The base year used for data delivery was 2012.

V.3.1. Current freight transport demand in the corridor area

In order to get a complete picture of the current freight transport demand along this important north-south corridor, all relevant transport modes were analysed on a country-to-country basis.

Rail freight traffic

The analysis of freight transport volumes on a country-to-country level shows that overall rail transport volumes between the countries involved in ScanMed RFC increased by more than 25% in the last decade and are currently estimated at approx. 58 million tons per year²⁵.

²⁴ <http://www.etisplus.eu/default.aspx>

²⁵ The choice of tons instead of ton-km as unit is deliberate. The TMS focused on country-to-country relations, for which the distances are more or less the same for all transport modes. As a consequence though, the share of rail in percentages mentioned under paragraph "Modal split" further below is significantly higher than it would be if the overview was done with ton-km.

Loading country	Unloading country							Share (loading)
	Norway	Sweden	Denmark	Germany	Austria	Italy	Total	
Norway		1.738	1	26	0	16	1.781	3,1%
Sweden	342		118	2.497	168	398	3.523	6,1%
Denmark	1	39		84	n/a	693	817	1,4%
Germany	85	2.346	631		8.370	16.652	28.084	48,4%
Austria	12	135	n/a	7.083		3.256	10.486	18,1%
Italy	31	242	503	10.968	1.541		13.285	22,9%
Total	471	4.500	1.253	20.658	10.079	21.015	57.976	100%
Share (unloading)	0,8%	7,8%	2,2%	35,6%	17,4%	36,2%	100%	

Table 4: Rail freight transport matrix for 2012 (1.000 net tons)²⁶

As a major import and export country, Germany accounts for 48% of shipped tonnage (loading) and 36% of received tonnage (unloading). Italy accounts for 23% of shipped and 36% of received tonnage, followed by Austria (18% of shipped and 17% of received tonnage). In comparison to this, the Scandinavian corridor countries' proportional share is rather small.

Road freight traffic

In 2012 the volume of road traffic between the corridor countries was slightly below the level of 2003 and can be estimated at nearly 90 million tons per year.

Loading country	Unloading country							Share (loading)
	Norway	Sweden	Denmark	Germany	Austria	Italy	Total	
Norway		3.767	539	290	n/a	n/a	4.596	5,2%
Sweden	4.168		1.299	1.173	108	92	6.840	7,7%
Denmark	714	1.681		5.279	0	122	7.796	8,7%
Germany	375	1.350	5.839		18.020	9.538	35.122	39,4%
Austria	31	44	45	14.277		6.131	20.528	23,0%
Italy	n/a	n/a	110	10.470	3.733		14.313	16,0%
Total	5.288	6.842	7.832	31.489	21.861	15.883	89.195	100%
Share (unloading)	5,9%	7,7%	8,8%	35,3%	24,5%	17,8%	100%	

Table 5: Road freight transport matrix for 2012 (1.000t)²⁷

Major origins and destinations are:

- Germany (40% of shipped / 35% of received tonnage)
- Austria (23% of shipped / 25% of received tonnage)
- Italy (16% of shipped / 18% of received tonnage)

72% of the total transport volume is transported between neighbouring countries.

²⁶ Source : own compilation based on Eurostat, iron ore traffic on Malmaban not included

²⁷ Source : own compilation based on Eurostat 01/14

The international road freight traffic to and from the catchment area of ScanMed RFC in Italy was analysed in more detail, determining export and import volumes from the NUTS 3 regions to every ScanMed RFC country with special emphasis on relevant ports and terminals.

Short-sea shipping

Regarding overall traffic from and to Scandinavia it has to be noted that short-sea shipping currently has the highest share of the overall transported tonnage since it provides the most economical alternative for bulk cargo in large quantities and for containers. The total market volume amounted to 84,6 million tons.

Shipping country	Receiving country					Total	Share (shipping)
	Norway	Sweden	Denmark	Germany	Italy		
Norway		5.553	5.466	14.979	335	26.333	31,1%
Sweden	2.137		6.116	12.805	173	21.231	25,1%
Denmark	2.054	7.965		5.916	84	16.019	18,9%
Germany	2.381	11.137	5.409		889	19.816	23,4%
Italy	263	133	241	600		1.237	1,5%
Total	6.835	24.788	17.232	34.300	1.481	84.636	100%
Share (receiving)	8,1%	29,3%	20,4%	40,5%	1,7%	100%	

Table 6: Short-sea shipping matrix for 2012 (1.000t)²⁸

In 2012, trade relations with the highest volumes were as follows:

- Sweden – Germany 23,9 million tons
- Norway – Germany 17,4 million tons
- Sweden – Denmark 14,1 million tons

Port traffic

The current traffic volumes of the various Scandinavian, German and Italian ports within the catchment area of ScanMed RFC have been analysed.

The traffic volumes of the Norwegian ports within the catchment area account for 12,4% of the overall volume handled by Norwegian ports. The highest volumes are shipped from and to the Grenland terminals at Skien, Porsgrunn, Bamble (total of 10,3 million tons) and from/to the port of Oslo (5,4 million tons).

Among the Swedish ports within the catchment area the port of Göteborg is the outstanding source and destination with a total traffic volume of 41,1 million tons in 2012. 38% of this volume is shipped from and to ScanMed RFC countries.

The Port of Hamburg is one of the major gateways served by trans-ocean services as well as short-sea services from all around the world. This results in a total traffic volume of 113,5 million tons, of which 10% are shipped from and to ScanMed RFC countries. Hinterland traffic by rail from Hamburg to international destinations amounts to approximately 3,6 million tons. Hinterland rail traffic from and to ScanMed RFC countries is dominated by Austria (approx. 712.000t, 20% of international hinterland

²⁸ Source: Eurostat 12/2013

rail traffic) and Italy (approx. 433.000t, 12% of international hinterland rail traffic). Lübeck, the largest German port on the Baltic Sea offers especially ferry and Ro/Ro-connections. It also offers special services for paper (2,9 million tons in 2013) and manufactured car transport (76.000 units in 2013), as well as containers (100.000 TEU in 2013) . The third German port within the catchment area is Kiel, which handled 4,2 million tons of cargo in 2012. The share of goods shipped from and to ScanMed RFC countries is 41%.

Due to the widespread catchment area of ScanMed RFC in Italy, a variety of ports are to be considered, which have different functionality regarding commodity structure, type of services as well as connections offered. Transports from and to ScanMed RFC countries by sea have a very low share in total shipping volumes of these ports (below 1% of total traffic of each port).

Within the catchment area of ScanMed RFC, Taranto is the port with the largest volumes (28,4 million tons in 2013). Today Gioia Tauro is a transshipment port and mainly a container handling port (3 million TEU in 2013). With this overall volume Gioia Tauro is among the TOP 15 European container ports. The port of Livorno is one of the largest ports in Italy, with a total transport volume of 28 million tons in 2013. A huge share of the traffic is Ro/Ro traffic (10 million tons). Container traffic has a significant share with nearly 559.000 TEU handled in 2013. Due to the different facilities and loading areas it can handle a wide range of commodities. One speciality of the port is the handling of new cars (356.000 cars in 2012).

The port of La Spezia is situated approx. 100 km north of Livorno. The total transport volume shipped by sea from and to La Spezia (15,5 million tons) is lower than the volume of Livorno. However, the port handles more containers than Livorno (1,3 million TEU in 2013) and is the third largest container port in Italy (after Gioia Tauro and Genova). La Spezia is the port of Italy with the highest percentage of rail transport. A share of 35% of total container traffic was moved by rail (more than 110.000 wagons). La Spezia is the third largest container port in Italy, after Gioia Tauro and Genova.

Modal split

The overall share of transports by rail in all countries, apart from Italy, lies below the share of road and short-sea shipping. Rail generally has a low modal split regarding transports between the Scandinavian ScanMed RFC countries (between 0% and 15%). Regarding border-crossing land transport from and to Germany, Italy and Austria rail has a higher market share (between 32% and 36%). Short-sea shipping accounts for the highest share in all three Scandinavian countries.

The trade lanes with the highest share of rail are:

- Denmark – Italy (68%)
- Sweden – Austria (67%)
- Sweden – Italy (62%)
- Germany – Italy (56%)

These percentages show the high attractiveness of rail on the transalpine connections and on long distances²⁹.

Commodity structure

For rail freight it can generally be concluded that crude and manufactured minerals together with building materials account for the highest share (24%) regarding overall transported tonnage

²⁹ See Footnote Nr.28

between ScanMed RFC countries. Further analysis shows that nearly 70% of this share is transported between Germany and Italy and vice versa. The second important category consists of machinery and transport equipment with a share of 21% of overall transported tonnage by rail between ScanMed RFC countries. This market segment is mainly determined by the automotive and manufacturing industry. Major transport relations are Germany – Austria, Sweden – Germany and Germany – Italy. The third important category comprises agricultural and forestry products. Strongest transport relations in terms of transported freight volumes within this category are Germany - Italy, Germany - Austria, Austria - Italy and Sweden - Norway. Germany plays a major role as an export country, a fact that is mirrored in the data presented on the recent developments of rail and road freight transport sector earlier in this report.

The commodity structure of road freight evidently represents the entire spectrum of commodity types. The respective shares for the proportionately largest categories are: 21% for agricultural products and woods, 15% for foods, 12% for mining products and non-metallic minerals, 12% for chemicals and refined petroleum products.

V.3.2. Analysis of corridor-related rail freight services

This chapter focuses exclusively on the analysis of rail freight traffic in the corridor area, covering corridor trains, which by definition start and end in the corridor area and cross minimum one corridor border, and the so called "additional" trains, i.e. trains that start/end in the corridor area, cross minimum one corridor border and enter/exit the corridor area.

In total approximately 29.600 corridor trains were operated in the ScanMed RFC in 2012. The Origin and Destination (O/D) relations with the highest number of corridor trains are:

- Germany – Italy (9.646 trains per year, both directions)
- Norway – Sweden (6.734 trains per year, both directions)
- Sweden – Germany (4.394 trains per year, both directions)

The figure below gives an overview of the O/D relations in the ScanMed RFC.

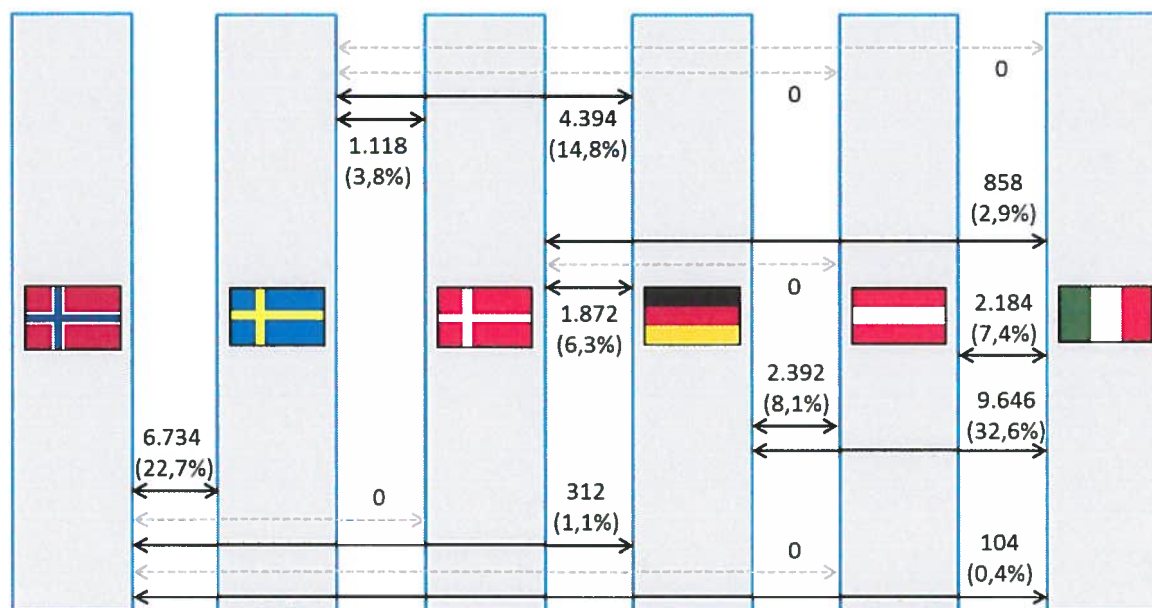


Figure 5: Corridor trains on major O/D relations (both directions, 2012)³⁰

The high number of corridor trains between Sweden and Norway derives from the fact that the catchment area covers the main industrial centres in the southern and central parts of Sweden (e.g. Göteborg, Stockholm, Malmö). In addition to that, there are only two other cross-border rail connections between Sweden and Norway outside the catchment area. Currently, only very few corridor trains operate along the entire corridor distance (i.e. between Norway and Italy). Nevertheless, more than half of the corridor trains cross more than one border. This is mainly attributed to the high number of trains running between Germany and Italy. The number of corridor trains between Germany and Austria is relatively low compared to the overall rail-based tonnage transported between Germany and Austria. This is due to the fact that only a small fraction of the Austrian territory is covered by the ScanMed RFC catchment area.

Corridor train traffic can be divided into the three major types of rail freight production systems as follows:

- Single wagonload - 38,2%
- Block trains - 25,8%
- Intermodal trains - 36,0%

The highest number of single wagonload trains (4.212) was operated between Sweden and Germany. The main O/D relation for block trains is Norway - Sweden (3.926 trains). The majority of intermodal trains (6.084) were operated between Italy and Germany.

About 17.200 additional trains were operated on the corridor in 2012. Most of the additional trains run on the following relations (both directions):

- Germany – Italy (12.428 trains)
- Denmark – Italy (1.898 trains)
- Sweden – Germany (1.638 trains)

National (domestic) and passenger trains were not part of the detailed analysis. But the share of corridor-related traffic in total rail traffic, including passenger trains, in major corridor sections was analysed, using train data provided by the Infrastructure Managers.

³⁰ source: own compilation based on data provided by IM's

V.3.3. Criteria for modal choice

The choice of transport mode is driven by a company's desire to remain competitive by serving their customers both effectively and efficiently. According to international studies and results of the stakeholder interviews, the major criteria, which strongly influence the choice of mode, could be grouped into the three categories:

- transport cost
- transport time
- transport quality, including factors like reliability, punctuality, safety & security and travel information

Based on interview results, rail scores medium on time and costs, but has an advantage in terms of predictability/punctuality and a disadvantage in terms of adaptation/flexibility. This was mirrored in reports by the stakeholders, who stated that ad-hoc train services (as opposed to timetable traffic) offer the necessary flexibility for customers, although today the proportion of ad-hoc traffic is reportedly low. Most stakeholders either assumed stagnation in ad-hoc traffic levels or at best a moderate increase. This could therefore be a response of rail to enhance its attractiveness to customers in terms of one central aspect to transport quality, i.e. flexible adaptation to customer needs.

Regarding the interview results on choice of transport mode, price emerged as the most prominent mode-determining factor. However, further issues such as type of cargo (time sensitive or not) and transport route (and hence available alternative modes) must be taken into the equation as well, when considering a mode's competitiveness.

Stakeholders were asked to rate the relevance of market-related criteria (price, time, quality) for the choice of transport mode they take into consideration, when deciding how to transport goods.

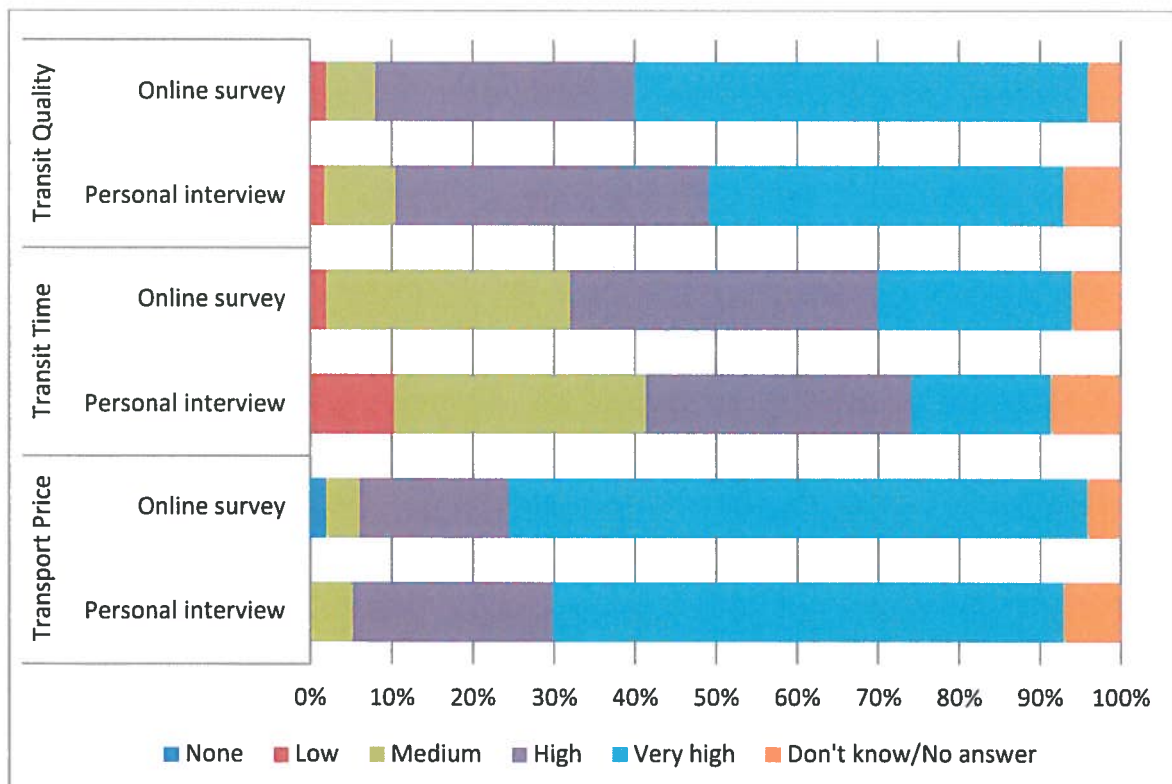


Figure 6: Rating of the importance of transport criteria

The interview results showed that both response groups rated the three transport criteria quality, time and price very similarly. Transport price received the most “high” and “very high” ratings from both. This finding is in line with the common credo that, to both the final customer and the operator “price is all that matters” and thus is the determining factor in mode choice (before further factors are considered). This is further underlined, when the transport criteria are presented by commodity group.

Transport quality was rated equally as important, with the majority of responses deeming these criteria “high” or “very high” in equal terms. Transit time received the most “medium” ratings, with stakeholders clarifying that very often not the total travel time but the reliability for goods to arrive at the pre-arranged time is crucial. With regards to terminology, “punctuality” refers to the arrival of freight (trains) at exactly the scheduled time and “reliability” refers to the ability of freight services to consistently perform the functions required and under the conditions agreed upon. From this distinction it becomes clear that punctuality is one of the functions freight services are required to meet, should they wish to be perceived as reliable by customers. Consequently the quality parameters listed in the figure below are all intertwined to some degree, with reliability forming an umbrella term.

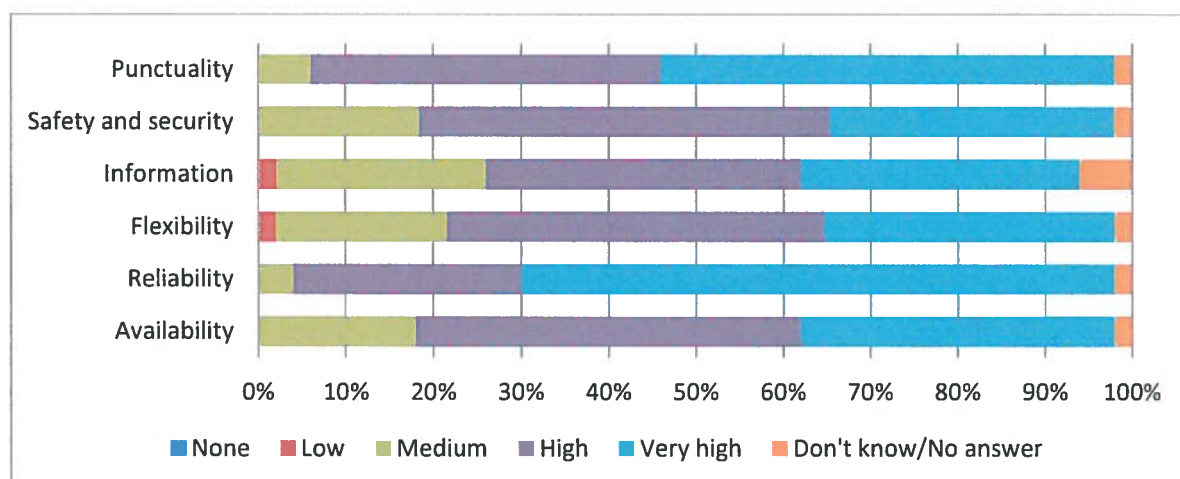


Figure 7: Relevance of quality criteria³¹

As the above graph shows, all quality criteria received around three quarters or more “high” and “very high” ratings, especially reliability and punctuality were deemed paramount by both operators and customers. These findings were closely mirrored by the ratings given by online respondents. The consistently high relevance attributed to these criteria also illustrates that it is the mix of all of these factors that determines the successful operation of rail freight. Consequently no single attribute can be regarded in isolation, when considering improvements to the system as a whole.

It emerged in stakeholder interviews that railway as transport mode is of common use depending on goods transported and distances covered, but faces challenges for the next future. “Railway mode is less flexible than road but when it works in the right way is really efficient” is one of the assertions collected during personal interviews trying to summarise the role of railway service in freight transport.

Transportation costs still remain the main issue in the global market and, as a result of the survey, railway together with short-sea shipping is the cheapest way to move goods on long distances. Both

³¹ Personal interviews

transport modes are strong in the transportation of mass goods and are in some cases in competition with each other often due to the lack of access to the railway network. Their integration would surely lead to a more efficient trip chain and to strengthen the role of each mode in their respective area of influence.

Travel time does not appear to be a peculiar quality of railway mode. Nonetheless, time is not generally considered to be a key issue in the current global market especially for those good categories that mainly interest railway mode. On the other hand, railway could really grab position in the "time competition" due to the improvements in the node management and in the communication and cooperation among infrastructure companies, terminals, ports, shippers and other stakeholders.

The flexibility and ability to adapt to customer requirements remains highly important. Its implementation is highly complex in the railway sector as it requires a strong relationship between Infrastructure Manager and railway operators whose "time to market" are different and of different nature.

V.4. Evaluation of future transport market development

The evaluation of future freight traffic development is based on the comprehensive analysis of the current market situation and both traffic forecast and long-term trends derive their basic information and input from a PESTL analysis and are complemented by stakeholder interview results.

V.4.1. PESTL-Analysis

Factors influencing rail freight in ScanMed RFC can be divided into five categories: political, economic social, technological and logistical (PESTL). These factors have been analysed accordingly.

As a result barriers and opportunities, influencing future traffic in ScanMed RFC, were identified.

Political analysis

- EU Directives have been largely transposed into national law.
- For transport modes other than rail, road pricing models as a financial disincentive for road freight transportation are widely known and debated concepts not without controversy. Austria has implemented a comprehensive charging system whilst in Denmark support for this approach has been lacking.
- ScanMed RFC countries undertake measures to promote longer trucks (Germany and Sweden), and encourage the shift of freight from road and rail onto either inland waterways or short-sea shipping.
- Generally the ScanMed RFC countries have been very successfully implementing EU policies on rail freight traffic. The railway liberalisation index provided by IBM and Humboldt University of Berlin shows that all ScanMed RFC countries have made significant progress since 2007. Four of the six ScanMed RFC countries have an index of 800 or higher which indicates an advanced liberalisation of the railway market, demonstrating that there is a significant impact of EU-driven liberalisation in national legislation.

Economic analysis

- Overall the economic development within the ScanMed RFC countries has been positive, showing a recovery from the economic crisis from 2009 up to 2012.

- Out of all ScanMed RFC countries Norway was hit the least by this crisis with a GDP decrease of -1,6% in 2009 compared to the previous year and therefore recovered quickest too.
- All other ScanMed RFC countries experienced an average GDP decrease ranging between -5,0% and -5,7%, except for Austria where it was less pronounced with -3,8%.
- A generally positive development in foreign trade can be observed. The ScanMed RFC countries play a rather significant role for trade with each other. At least one ScanMed RFC country is usually among the top-3 trade partners of the other respective ScanMed RFC countries.
- Germany plays a major role as import and export partner to all other ScanMed RFC countries and the Scandinavian countries have strong trade connections with each other.
- Italy's top-3 import and export partners are Germany, France and China.
- The GDP forecasts available expect a positive development in the near future (i.e. up to 2017) in all corridor countries, with higher growth rates in the northern part of the corridor.

Social analysis

- Unemployment levels increased significantly after 2008/2009 as a result of the economic crisis and started to decrease again in 2012.
- The average income shows an overall rise, though the in-work at-risk poverty rate has been increasing in all ScanMed RFC countries.

Technical and organisational analysis

- Diversity across the ScanMed RFC countries in terms of infrastructure quality and standards exist.
- Technical bottlenecks regarding the different signalling and electrification systems are present and require costly solutions (e.g. multi-system locomotives or locomotive changes at border crossings).
- No restrictions regarding loading and track gauges exist, but the corner height of semi-trailers and swap bodies poses a problem south of Bologna, where lower corner heights are required than along the rest of ScanMed RFC. They necessitate either the use of special – and more expensive – pocket waggons or the transfer from rail to road.
- Capacity problems at some terminals affect the efficiency of intermodal freight transportation and the freight transport chain. To mitigate this, several development projects in all ScanMed RFC countries are underway³².

Logistical analysis

- Overall good logistical conditions and a good terminal infrastructure network along ScanMed RFC prevail. Each country provides several ports and terminals as well as interconnections for intermodal transportation.
- Despite RoLa initiatives for road freight traffic, the Brenner remains a bottleneck, especially for rail freight. The Brenner Base Tunnel – to be in place by 2026³³ – promises an improvement to the situation and is therefore of long-term relevance for the development of ScanMed RFC.

³² Some of them are: Oslo Alnabru Terminal; upgrade of container terminal in Stockholm port; extension of MegaHub Lehrte; new terminal for combined transport in the port of Ancona

³³ According to ÖBB Infrastruktur AG

V.4.2. Forecast of future transport volumes

The traffic forecast is based on findings of the analysis of the current situation and the PESTL analysis, with the socio-economic development being the decisive factor. It also takes into account the results of the stakeholder interviews. The forecast covers the short-term period up to 2017.

For rail freight traffic development on a country-to-country level the highest growth rates are forecasted for rail freight exports from Norway and Sweden. There will only be a moderate increase of rail freight traffic from Denmark, Germany and Austria. Exports by rail from Italy show only a relatively low increase. There will be no significant changes in the country-to-country relations within the short-term forecast period. In 2017, the highest rail freight volumes will be transported between Germany and Italy.

For the majority of the country-to-country relations, rail freight traffic is increasing faster than road transport. Relatively low increases will occur in road freight transports to and from Denmark and Italy. Up to 2017 the highest road freight volumes will be transported between Germany and Austria/Italy.

In the short-sea shipping sector the highest growth rates are expected for exports from Norway and Sweden. Only an insignificant increase in short-sea transportations to and from Italy is projected. Also in 2017 the biggest short-sea shipping volumes will be transported between Germany and the Scandinavian countries.

Only insignificant changes in the overall modal split of freight transport between the corridor countries are expected by 2017. The share of total rail freight transport between the corridor countries slightly decreases while short-sea shipping remains the dominant transport mode between the Scandinavian countries.

Forecasts on corridor-related rail freight traffic are based on growth rates for overall rail freight traffic between corridor countries. As the forecast of rail freight traffic in ScanMed RFC refers to numbers of trains (not freight volumes), it must be noted that such a projection always bears uncertainties. Based on the development of transport demand (by quantities of goods), the extrapolated number of trains required may deviate from the actual number of trains that will operate by 2017. The definite number of trains resulting from any new trade relation is consequently very hard to accurately predict in traffic models. This point was also emphasised by train and terminal operators in the personal interviews.

The number of corridor trains will increase by 5,7% (1.695 trains) over the forecast period. Thus, a total number of 31.309 corridor trains are expected to operate in 2017. For corridor train traffic the highest growth rates are observed between the Scandinavian countries. Germany - Italy remains the major O/D relation in ScanMed RFC. The following figure shows the major O/D relations in 2017.

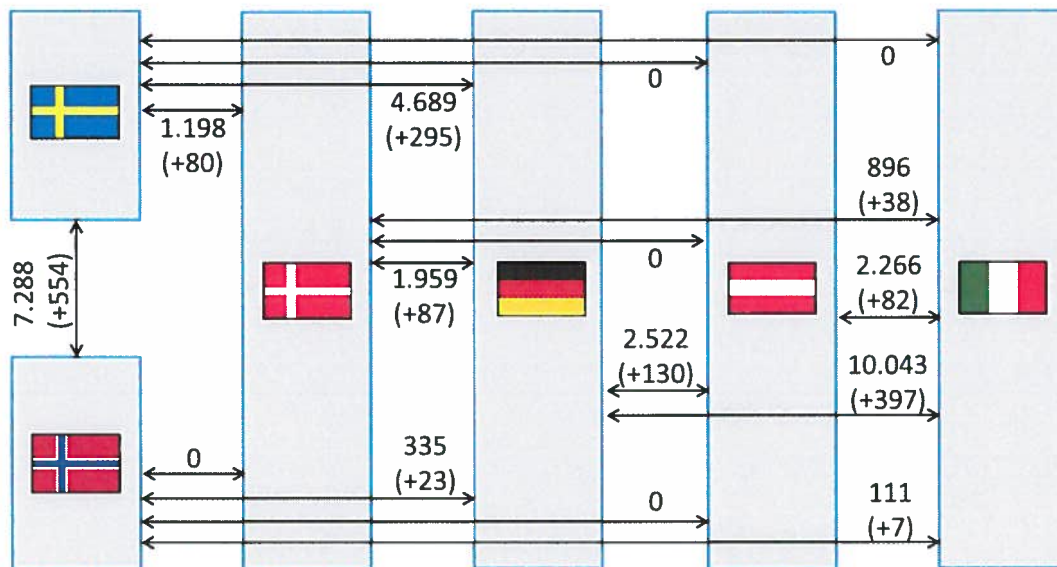


Figure 8: Projected O/D relations for corridor train traffic in 2017

In 2017 the total number of expected additional trains along the corridor will amount to 18.048. This suggests an increase by 5,2 % (888 trains), similar to the predicted growth in corridor train traffic.

Findings from stakeholder interviews support this optimistic short-term outlook. Encouragingly more than 60% of the stakeholders expect a rise in their involvement in corridor-related services in both the immediate as well as the more distant future. The following figure illustrates stakeholder expectations of the transport market development in the ScanMed RFC.

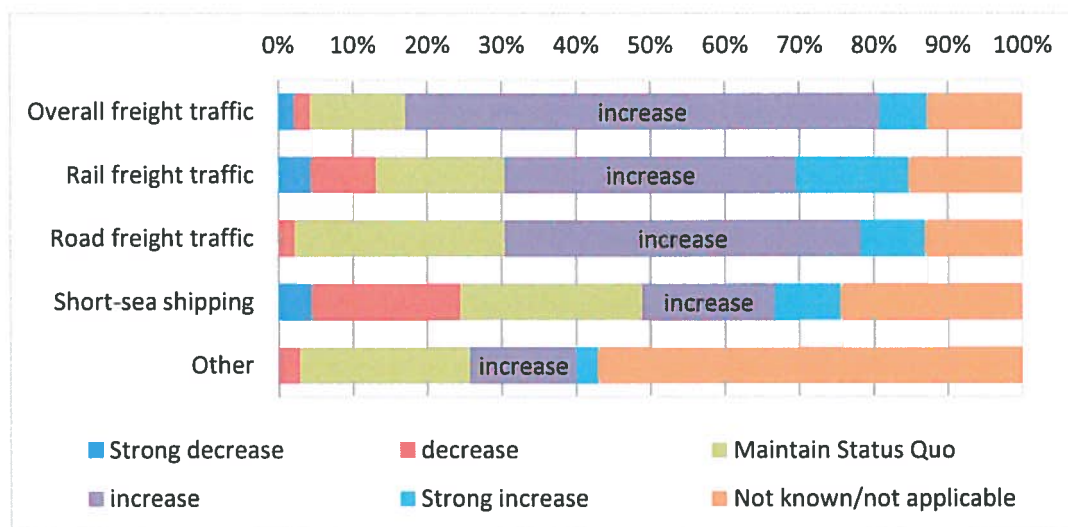


Figure 9: Stakeholder assessment of ScanMed RFC traffic by 2017³⁴

With regard to market developments in the corridor area, the main findings of the interviews in the corridor countries are summarised below.

Norway: Generally demand will increase. The Nordic countries and Eastern Europe are seen as growing markets. A doubling of volumes in the corridor for freight transported by road and rail is foreseen.

Sweden: According to major stakeholders, their current freight transport volumes are expected to double in the short-term, similarly to the view of the Norwegian stakeholders.

³⁴ Online survey

Denmark: Generally growth is expected, however, how high this will be depends largely on the industry sector (e.g. pulp/paper production has been decreasing lately). Nevertheless, stakeholder estimations of between 1% growth p.a. (and 10-15% over the entire time-period) suggest a stable outlook.

Germany: Overall, stakeholders foresee growth, however, its rate differed greatly between individual responses ranging between 2% p.a. and 20% p.a.. Only a minority predicts stagnation (in part due to Italy's long-lasting recession) or a moderate rise for their company's involvement.

Italy: Most stakeholders expect a recovery with the aim for a low/slight increase in growth. The more optimistic answers foresee 8% growth for business in the time-period and a fivefold increase in transported tonnage (however for road and rail together).

V.4.3. Future requirements for technical parameters

The interviews revealed that most of the stakeholders see enhanced technical parameters as an important factor to improve the competitiveness of rail freight transport. Especially longer and heavier trains can contribute to the reduction of specific costs per ton of transported cargo. Stakeholders also stressed the importance of harmonised parameters along the entire corridor.

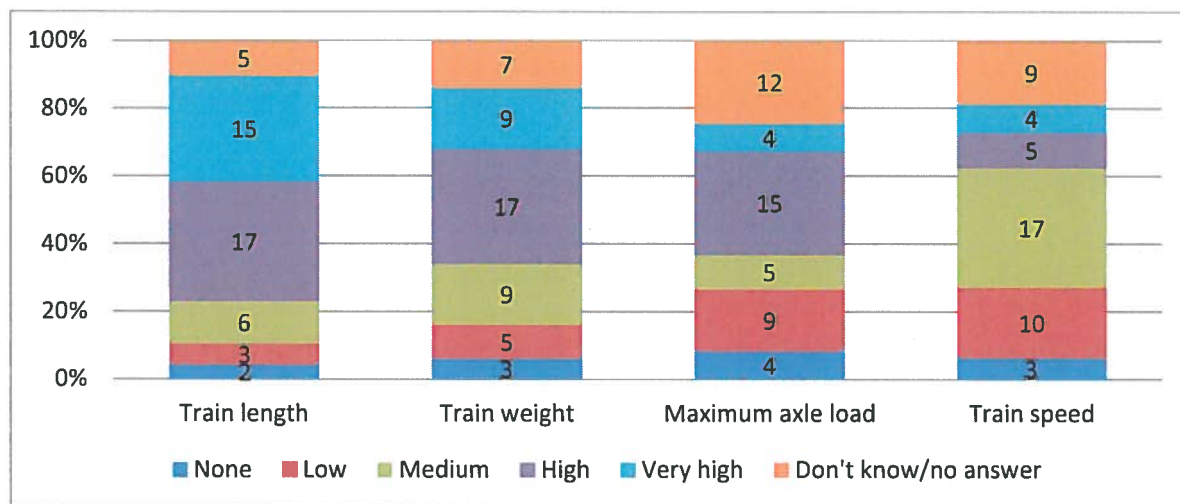


Figure 10: Rating of importance of technical parameters³⁵

Ratings for the influence of technical parameters for rail freight in the corridor were similar for stakeholders across all countries. **Train length** emerged as the parameter with the highest relevance ratings for its influence on rail freight traffic. In general terms stakeholders perceived longer trains to increase productivity and reduce costs consequently boosting rail's competitiveness. However, an adequate adaptation of the infrastructure (e.g. extended sidings) would initially create costs and here – stakeholders felt that – political willingness to back the financing and planning of network extensions was lacking. It also emerged in the interviews that no corridor-wide standard for train length currently exists. Currently, the maximum permitted train length along the preliminary route varies between 480m (Southern Italy) and 850m (Denmark). Stakeholders commented that a unified maximum train length of 740m would be a realistic target for train operation along the corridor. Overlong trains (850-1000m) were deemed unrealistic by stakeholders.

³⁵ Personal interviews; absolute number of mentions (n) has been added for each of the rating categories

An increase in **train weight** was considered desirable, as this too is a price-determining factor. However, train weight is not solely dependent on the cargo's weight and certain routes/sections can only support lower weights (e.g. Kiel channel and the Brenner Pass constitute weight-related bottlenecks). In sum, however, train weight was not deemed particularly relevant for combined traffic and extensive D4 standard coverage was felt to be sufficient by stakeholders.

No need was voiced by stakeholders to alter the **axle load** of 22.5t, as this is already the maximum and, though closely related to length and weight, it is of little relevance to combined traffic.

With regards to **maximum speed** the stakeholders stressed that the average travel speed is more important than maximum speed and that the last mile is very often the determining factor with regards to reliable overall travel times. Though 120-140km/h would be technically possible in Germany it was felt by stakeholders that a constant maximum speed of 100-120km/h would be both sufficient and less costly. Reported travel speeds for Italy were a lot lower (as low as 50km/h in one instance) and this highlights stakeholders' opinions that freight trains' speed has not been sufficiently harmonised to date.

With regards to the influence of longer and/or heavier trains on transport volumes stakeholders commonly stated that enhancing these parameters would render rail-based freight transport more efficient, allow for competitive pricing due to higher transport volumes and hence lower units costs. However the network infrastructure was deemed the main hindering factor to enable longer and heavier trains. Here, it was felt by stakeholders, a long-term solution to international bottlenecks presently dampening train lengths and weights ought to be sought.

V.4.4. Identification of long term trends likely to impact international rail freight

Studies projecting both economic and freight traffic development trends expect an overall positive economic development, increased integration of European markets and thereby growing transport demand in the coming years. This is assumed despite the economic crisis of 2008/2009, from which most European countries, especially the ScanMed RFC countries, have been recovering fairly well.

This expected growth is supported by the following assumptions³⁶:

- a growing worldwide network of production, logistics and transport
- a growing degree of labour division both within the EU member states and worldwide
- an increase of goods' volumes on site and transported around the globe
- an increase of international trade will influence volumes of long-distance hinterland traffic
- a possible goods' structure effect for rail freight traffic

Rail freight might especially be able to benefit from this growth as long-distance hinterland transportation (>300km) will increase. Rail freight will, however, have to become more efficient and benefit more from interoperability and inter-modality investments, in order not to lose possible growth to other transport modes. Seamless door-to-door transport chains are necessary for freight customers and these depend on:

- the production costs on the mainline run
- railway infrastructure
- interoperability in Europe
- transparent information politics for customers

³⁶ comp. König/Hecht 2012

- safety and security measures along the route

Overall, a further growth of transport volumes and transport performance along the corridor is to be expected also in the long term. Stakeholder interviews and the current market studies regarding the economic and transport-related development within the EU and in the ScanMed RFC countries tend to confirm this assumption. Despite this positive trend, a major change of modal split in favour of rail is not likely to occur by 2030. Rail traffic development along ScanMed RFC will be positively affected by two major infrastructure projects: the implementation of the Brenner Base tunnel and the realisation of the Fixed Fehmarnbelt link. The related traffic forecasts indicate that – in the best case scenario – both the overall market situation and the positive effects of these investments could lead to a doubling of freight transport volumes by 2030. The resulting cost and time savings as well as improvements to operational stability will strengthen the competitive situation of rail transport. However, these investments alone will not lead to a major change of modal split in favour of rail.

From the current point of view, intermodal transport will contribute more to any additional rail volumes than wagonload traffic. Although the technical network conditions on the corridor are generally already suitable for intermodal transport, an upgrade of the loading gauge on Italian line sections south of Verona for transport of semi-trailers on conventional pocket wagons might support the development of intermodal transport.

The share of hinterland traffic from and to the major sea ports in Italy and Germany is currently very low and the growth potential appears limited in comparison to other rail freight corridors (e. g. Rhine-Alpine and North Sea Baltic corridors). However, an attractive ScanMed RFC could support the development of hinterland services from the Italian ports to southern Germany.

V.5. Conclusions and recommendations

V.5.1. SWOT Analysis³⁷

The SWOT analysis was applied as an analytical tool to identify strengths and weaknesses for the development of rail freight traffic in ScanMed RFC. The possible opportunities and threats are derived from these strengths and weaknesses and assessed according to their influence on rail freight developments.

For the means of this study, four categories have been identified and assessed by SWOT analysis technique:

- Institutional elements are understood to be external factors, such as EU legal acts, safety standards, and organisational frameworks in the ScanMed RFC countries.
- Economic elements refer to overall economic developments in the EU as well as per ScanMed RFC country, per transport mode and per type of good.
- Organisational elements represent the internal dimension that can be influenced by the IMs themselves (while the institutional elements influence the overall market development and its functions). These include cross-country cooperation, information policies and other general factors.
- Technical and infrastructural elements include issues such as ERTMS deployment status along ScanMed RFC as well as bottlenecks.

³⁷ SWOT stands for Strengths, Weaknesses, Opportunities and Threats

The Table reported below summarizes the main results achieved by the SWOT Analysis for each of the above listed categories.

Strengths	Weaknesses	Opportunities	Threats
Institutional	<ul style="list-style-type: none"> High safety standards and safety record (compared to road transport) 	<p>Deriving from the railway market:</p> <ul style="list-style-type: none"> Significant market impact of EU-driven liberalisation in national legislation Efforts for implementation of a Single European Safety Certificate with the pending 4th railway package Ongoing implementation of ScanMed RFC as well as the establishment of an RFC Network 	<p>Deriving from the railway market:</p> <ul style="list-style-type: none"> Tightening of environmental regulations concerning movement of dangerous goods in urban areas and storage of dangerous goods in terminals Stricter regulations on noise and pollution
Economic	<ul style="list-style-type: none"> Extensive and sustainable trade relations between the corridor countries Germany covers the role of major import and export partner to all other ScanMed RFC countries Germany – Italy via Austria is the trade lane with the highest volume in container 	<p>Deriving from the road market:</p> <ul style="list-style-type: none"> Further development of road pricing systems as well as rising fuel costs EU policy makers generally prefer rail above road freight for future freight transport policy and try to facilitate better intermodal logistics solutions, but also support MoS and IWW 	<p>Deriving from road & short-sea shipping:</p> <ul style="list-style-type: none"> Promotion of so-called Gigaliner, e.g. in Germany and Sweden Promotion of Motorways of the Sea to cover future freight transport needs
	<ul style="list-style-type: none"> Slow process of an EU-wide implementation of homogenous technical and safety regulations and rules in all member states Slow process of harmonisation of national legislation based on requirements by EU-Legislation due to generally time-consuming decision-making processes in national politics 	<p>Deriving from the railway market:</p> <ul style="list-style-type: none"> Positive GDP development in the corridor countries in the short-term forecast period and optimistic long-term perspectives ScanMed RFC includes countries with above EU-15 or Eurozone average economic development (Germany, Scandinavian 	<ul style="list-style-type: none"> Decrease of production in sectors using/producing rail-affine products (e.g. pulp/paper/wood/steel) High level of modal share for road and short-sea shipping and hence fierce competition in certain O/D relations on ScanMed RFC Competitiveness of rail
<ul style="list-style-type: none"> Major O/D relations either domestic or with immediate neighbouring country, practically no end-to-end trains operated in ScanMed RFC Modal share of rail is lower than road in almost all O/D relations in ScanMed RFC Stagnation in modal share 			

	Strengths	Weaknesses	Opportunities	Threats
	<p>traffic in Europe</p> <ul style="list-style-type: none">Rail is the preferred transport mode for certain commodities, i.e. heavy, bulky, time insensitive.	<ul style="list-style-type: none">Road is still the preferred option for the majority of goods between Germany and Italy along the corridorHigh costs of infrastructure improvements (e.g. additional capacity, sidings)	<ul style="list-style-type: none">Assessment by the stakeholders of a high involvement in the corridor-related servicesIntermodal traffic will continue to grow at a higher rate than conventional wagonload trafficIncreasing road user charges (e.g. in Germany) and congestion on roads might limit attractiveness of road transportHigher energy efficiency of rail transport (compared to road) will support development of more environmentally friendly supply chains	<p>depends on the “last-mile-price”</p> <ul style="list-style-type: none">Further decline of single wagonload (SWL) in Europe might lead to reduction of corridor-related SWL servicesWagonload traffic (block trains and single wagonload) will have a major share in traffic along the corridor, but the growth potential might be limited and will be behind intermodal transportRail transport costs cannot be significantly decreased to provide a cost-effective alternative to direct road transport.Rising costs for infrastructure use due to enforcement of higher technical standards³⁸Possible implementation of mega-trucks in the EU might strengthen economic advantage of road transport
Organisational	<ul style="list-style-type: none">Ongoing harmonisation of processes (e.g. C-OSS; elimination of waiting times at borders, etc.)Establishment of C-OSS as a	<ul style="list-style-type: none">Insufficient information flows and communication processes between RU and IMsLack of flexibility in terms of	<ul style="list-style-type: none">Better conditions for cooperation along the corridor for all stakeholders involvedRestrictions to freight	<ul style="list-style-type: none">Shortages of train drivers experienced at current transport levels (e.g. in Sweden, Germany)

³⁸ if a higher share of upgrade and maintenance costs for rail infrastructure is to be covered by RU's, e.g. for ERTMS, Brenner Base tunnel, Fixed Fehmarnbelt link) due to lack of public funding

	Weaknesses			Opportunities		Threats
	Strengths					
Infrastructural /Technical	single point of contact	changes to allocated train paths	transport by road on public holidays and at weekends.			
	<ul style="list-style-type: none"> Ongoing efforts for establishing a RFC –wide network 	<ul style="list-style-type: none"> Necessity to adapt PCS to the Corridor requirements 	<ul style="list-style-type: none"> Tax advantages for HGV used in combined transport work in favour of rail 			
	<ul style="list-style-type: none"> Yearly evaluation of the corridor performance and yearly survey with the stakeholders 	<ul style="list-style-type: none"> Heterogeneous price systems between the corridor countries Process of harmonization difficult for integration of international feeder and outflow paths (e.g. construction of feeder and outflow paths follow national rules) 	<ul style="list-style-type: none"> Improvement of information processes for customers mirroring the development in the road sector 			
		<ul style="list-style-type: none"> Limited attractiveness of PaPs and C-OSS, if terminal capacity or connecting feeder paths need to be booked or arranged using national systems Quality of service (i.e. train punctuality and path availability) hampers the development of attractive transport solutions for freight customers 	<ul style="list-style-type: none"> Improvements in network access for Authorised Applicants Railway Undertakings (e.g. C-OSS as a one single point of contact for requesting and allocating PaPs) Changed customer behaviour (: customers require a personalized communication and have individual requirements) creates the favourable premises for an increased customer orientation. etc. 			
Infrastructural /Technical	<ul style="list-style-type: none"> Technical network conditions on the corridor are generally already matching most of the technical requirements, incl. intermodal transport 	<ul style="list-style-type: none"> Limited line capacity on heavily utilised sections, priority given to passenger transport 	<ul style="list-style-type: none"> Establishment of strategic development plans to increase capacities of intermodal terminals along the corridor 	<ul style="list-style-type: none"> Insufficient terminal investment and operational strategies combined with lack of financing 		
	<ul style="list-style-type: none"> Transparent construction of PaPs with standard technical parameters (e.g. 	<ul style="list-style-type: none"> Different roll-out stages of ERTMS along the Corridor Missing ERTMS synchronization may lead to different and incompatible 	<ul style="list-style-type: none"> Upgrade of the loading gauge on Italian line sections south of Verona Strengthening of the 	<ul style="list-style-type: none"> Problems to generate economic utilisation of trains due to scattered terminal investment strategies and lack of 		

Strengths	Weaknesses		Opportunities	Threats
<div>axle load, loading gauge)</div> <div><div><div>▪</div><div>Ongoing major projects (Brenner Base tunnel, Fehmarnbelt, ERTMS) will increase the capacity of the corridor and support future traffic growth</div></div></div>	<div>versions along the</div> <div>Corridor(s)</div> <div><div><div>▪</div><div>Further harmonisation necessary regarding train lengths</div></div><div><div>▪</div><div>No measures yet to synchronise train paths and terminal slots</div></div><div><div>▪</div><div>Changes of locomotive and/or driver at border crossings increase transport time</div></div></div>	<div>competitive position of Italian ports and using their attractive location in the international overseas transport network</div> <div><div><div>▪</div><div>Improvement of terminal and train operation concepts for integration of single wagonload and intermodal transport</div></div></div>	<div>cooperation.</div> <div><div><div>▪</div><div>Limited intermodal capacity of terminals in Germany, Austria and Italy</div></div><div><div>▪</div><div>Continuing decline of private railway sidings due to high costs and lack of financing</div></div><div><div>▪</div><div>Technical barriers (loading gauge and permitted axle loads) for shifting semi-trailer transport to rail</div></div><div><div>▪</div><div>Seasonal closure of transalpine line sections, especially due to severe weather conditions might affect attractiveness of rail transport</div></div></div>	

Table 7: SWOT Analysis

V.5.2. Recommendations

Institutional

Overall, the IMs cannot drive the implementation process concerning the institutional reform steps on a national level alone, but they can push for a coordinated process across all ScanMed RFC countries in order to maximise the strengths, which the liberalisation brings to freight traffic growth.

The IMs should therefore push for a harmonised approach to overcome the different levels of implementation and harmonisation on the corridor. This concerns in particular the EU-wide implementation of homogenous technical and safety regulations and rules in all member states.

Economical

From an economic point of view, the IMs should closely monitor the future economic developments and the effects on ScanMed RFC. They need to clearly communicate the need for investments in order to fulfil EU-wide and national policies on moving freight from road to rail. As overall costs have a huge impact on the competitiveness of rail freight the IMs should strive for an efficient infrastructure pricing regime keeping rail freight competitive.

Organisational

(a) Corridor capacity offer

The current distribution of corridor trains clearly shows that the majority of corridor trains are not crossing more than two corridor borders. On some of the cross-border sections (Malmö-Copenhagen-Hamburg, Verona-Innsbruck-Munich) a higher number of corridor trains exist as indicated in the number of corridor trains before and after these sections. This is likely to have its origins in the existing production system, where SWL traffic at the border stations/yards is being consolidated into international trains, but also in the change of national to international train numbers (and vice versa) at these stations. But it is also an indication that the demand for long Pre-arranged train paths is rather low as the RUs do not want to commit themselves and try to keep the PaPs as short as possible to be able to react in a more flexible manner in the pre- and post-trip in the respective country's hinterland.

This observation is also seconded by an indication from the stakeholders that they need a higher flexibility and availability, meaning to be able to have train path booking as flexible as possible (on a short notice, to be able to react to market requirements or changes), which in turn should be as highly available as possible (capacity-wise). The long lead times (i.e. booking required 9-12 months in advance) from ordering to utilising a train path shifts the economic risk entirely to the railway operators.

Therefore within the next couple of years the necessity to offer Pre-arranged paths along the corridor from a market point of view corresponding to Regulation (EU) No 913/2010 (offer internationally coordinated Pre-arranged train paths 11 months in advance) across more than 2 corridor borders is quite negligible at the moment. It is not expected that this number of trains to increase dramatically over the next 5 years.

It can be expected that in the future RUs might go for Pre-arranged train paths at sections across borders where capacity restraints exist (bottlenecks, no diversionary routes available) in order to secure relevant capacity for its own traffic and to gain a competitive advantage.

So it is to be expected that rather short PaPs across the borders are requested in the future (mirroring the current development at certain sections). These should be closely monitored by the IMs in order to provide enough capacity at these sections so the PaPs would not be seen as capacity destructive on a section where not much margin of manoeuvre is available.

This should be kept in mind by the IMs when offering PaPs in the near future.

(b) Enhancement of international train path management

The establishment of a C-OSS along the whole ScanMed RFC should be realised as soon as possible in the future in order to be able to offer a single contact point for all RUs and applicants along the corridor as well as providing a seamless and comprehensive corridor management.

The IMs should foster cross-border harmonisation and establishment of information standards along ScanMed RFC on corridor trains to enable an identical definition and identification along the corridor.

The train path management should also include the continuous conduction of regular stakeholder interviews or stakeholder conferences along the corridor, using the information to enhance the services of the C-OSS and to ensure the attractiveness and utilisation of the offered PaPs.

These organisational improvements should include:

- Integration of corridor and non-corridor development steps on infrastructure capacity by the IMs (harmonisation of infrastructure development across the network of individual IMs in connection with the corridor itself)
- Provision of tracking and tracing information on trains based on real-time data to provide up-to-date Information on performance of trains (delays, position)
- Flexible (on a short notice) train path management to be able to react to market developments on a national as well as international level (C-OSS)
- Advance information on maintenance, repair and construction works along ScanMed RFC
- Development of an organisational and contractual framework between railway undertakings, IMs and terminal operators to react on severe weather conditions, especially if one transalpine crossing is blocked

Infrastructural/technical/logistical

Concerning the improvements for railway and terminal infrastructure along ScanMed RFC it is recommended that the IMs strive for the standardisation of technical parameters of network / terminals, e.g. train length (740m trains), 22,5 t axle load and a speed of 100km, together with the extension of sidings along the Corridor (with the aim of handling a minimum train length of 740 m along the corridor³⁹) and upgrading of loading gauges to transport semi-trailers along the whole corridor. The harmonisation of signalling and train control systems with the establishment of ERTMS needs to be pushed forward. Within the terminals the extension of storage capacity in coordination/cooperation with the terminal operators should be focused on together with the enhancement of terminal capacities incl. 7 days/24 hours operation, where necessary.

Improvement measures suggested by Stakeholders

From the stakeholders point of view the following measures were deemed necessary to improve and enhance rail freight traffic along the corridor in order to be able to increase their involvement in rail freight services:

³⁹ Longer sidings on certain sections also possible where market development warrants this

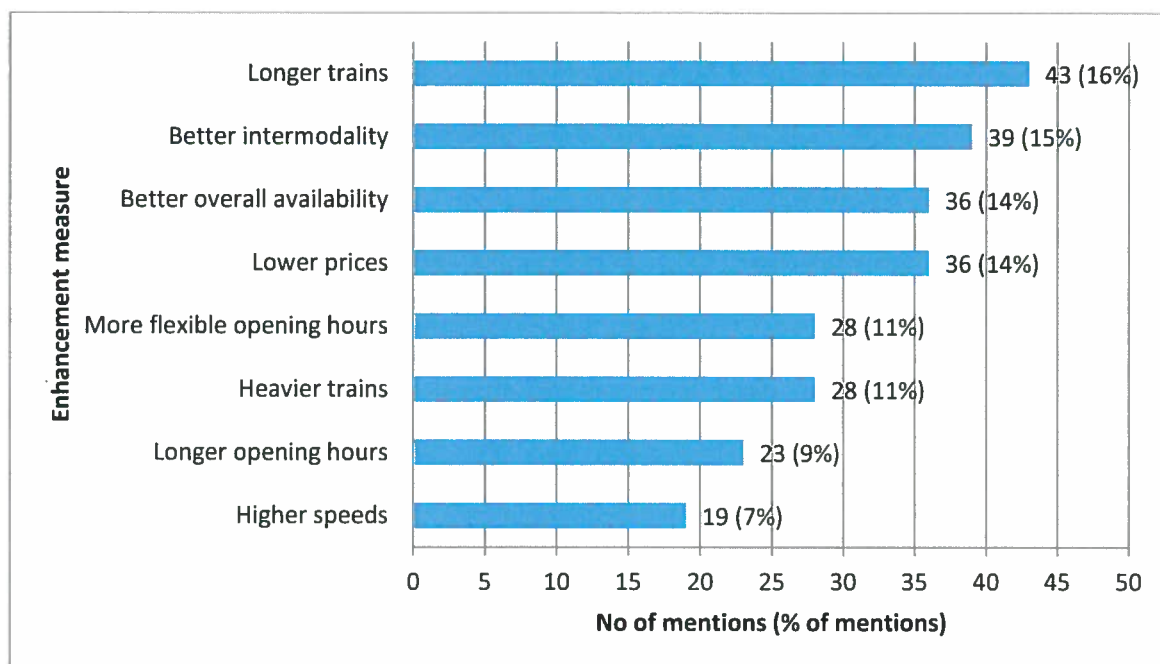


Figure 11: Enhancement measures suggested by stakeholders⁴⁰

This clearly shows that there is a broad range of improvements the stakeholders would like to see. Longer trains emerges as a central issue among the mentioned enhancement measures, followed by required improvements of inter-modality in the corridor.

V.5.3. Conclusions

The following elements will likely have the strongest effect on the demand of (rail) freight transport in the near future (facilitators):

1. Development of Gross Domestic Product (GDP) in the countries along the corridor
2. Decrease of barriers in international trade and transport along the corridor
3. The further development of combined transport in freight traffic along the corridor
4. The further harmonisation of costs, reliability and availability of rail freight transport along the corridor
5. Effects of liberalisation on the competitiveness of rail freight transport along the corridor

In order to fully take advantage of those developments the following factors are deemed necessary (from the IMs' perspective) to facilitate growth in the short-term period until 2017:

1. Cost-effective harmonisation of network-related train parameters (train length, train weight)
2. Harmonisation of information processes (e.g. constant monitoring and evaluation of requested international train paths)
3. Harmonisation of pricing regime along the corridor (transparent and reliable)
4. Establishing a C-OSS along ScanMed RFC (comprehensive corridor management)
5. Harmonisation of infrastructure capacity in terms of providing additional storage and siding capacity in close coordination with the terminal operators (especially concerning storage capacity)
6. Providing flexible and reliable services towards the clients (RU) and ultimately the customers (shippers)

⁴⁰ Personal interviews

7. Enhancing the service portfolio to ease network access for all corridor network users (e.g. train handling and shunting services on shunting yards)

One of the major factors that will improve the market share of rail freight in the future will be the price of the services including total cost of use, followed by factors like reliability and flexibility of the services. Added to that are service information for clients and customers and service orientation towards the customers (shippers).

VI. Investment Plan – Approach and Overview

VI.1. List of Corridor-relevant investment projects

Following Art.11 of Regulation (EU) No 913/2010, ScanMed RFC delivered a list of projects for the extension, renewal or redeployment of the railway infrastructure.

The list of projects was defined jointly, using information from the indicative national investment plans, with an aim to emphasize those projects that have a positive impact, in terms of efficiency and competitiveness, on international rail freight along the Corridor including cross-border barriers and barriers somewhere else. The components of the list are an indicative commitment of Member States to provide the necessary resources for the development of the Corridor and may encounter adjustments in time, costs and financing.

The list of projects that are relevant for managing the capacity of international rail freight is detailed in Annex VII. The Annex provides information on the nature of the project, its cost, the contribution of EU-Funding whenever relevant, the financing status and the benefit expected from the project for the capacity of international rail freight.

Following this approach, the IMs of ScanMed RFC identified **99 projects** and clustered them in

- three different **time horizons**:
 - Short term: 2014-2019
 - Medium term: 2020-2024
 - Long term: 2025 and beyond
- three different **maturity stages**:
 - Secured: financed and approved projects;
 - Planned: not yet financed or approved projects;
 - D/R (Development and Review): Studies or projects to be shifted in time.

The list encloses projects reaching a **total cost of 98 billion €⁴¹**.

⁴¹ ERTMS and CBTC deployment in Denmark, the cost of which is estimated at approx. 2,0 billion€ is not included in the cost overview given in this chapter, as ScanMed RFC stretches could not be individualized within the deployment project on the whole national network.

Total cost of projects

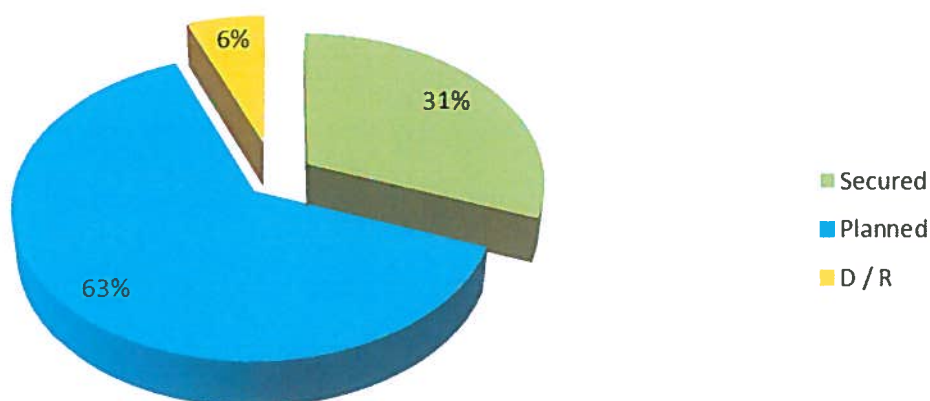


Figure 12: Share of all investment projects according to their financing status

VI.1.1. Project breakdown per time horizon

- **Short term projects (2014-2019)**

Foreseen investments are bundled in **36 projects** representing a total amount of **9,57 billion €**. The following chart breaks down the short term project on the basis of their financial maturity:

Total cost of projects - Short Term

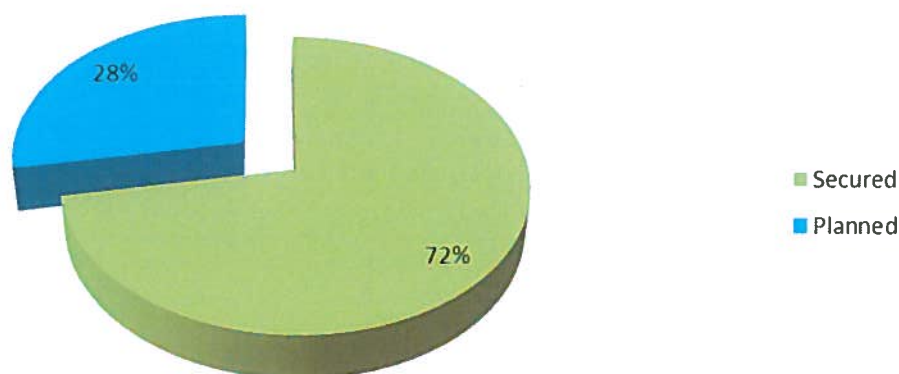


Figure 13: Share of short term investment projects according to their financing status

- **Medium-Term projects (2020 – 2024)**

Foreseen investments are bundled in **35 projects**, representing a total amount of **19,84 billion €**, whereby 3 projects have no or no individual cost estimate. The following chart breaks down the medium term project on the basis of their financial maturity:

Total cost of projects - Medium Term

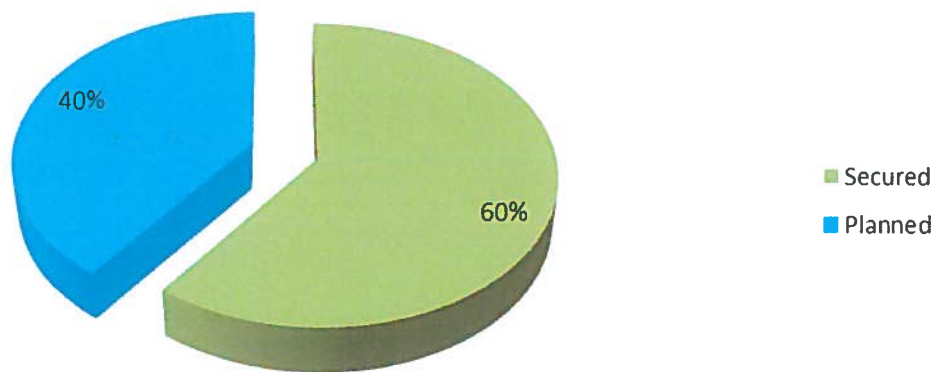


Figure 14: Share of medium term investment projects according to their financing status

- **Long term projects (from 2025 onwards)**

Foreseen investments are bundled in **28 projects** representing a total amount of **68,59 billion €**, whereby 2 projects have no cost estimate. The following chart breaks down the long term project on the basis of their financial maturity:

Total cost of projects - Long Term

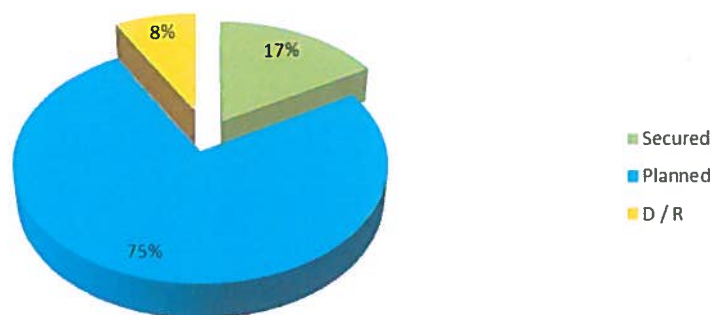


Figure 15: Share of long term investment projects according to their financing status

VI.1.2. Project breakdown per country

In addition to the state funding, the benefits produced by each project in each country were clustered as follows:

- The **removal of infrastructure bottlenecks**: this group includes those projects which increase capacity by structurally modifying the infrastructure, such as new lines, double-track, new tunnel, infrastructural modernization, new bridges etc.
- The **removal of operational bottlenecks**: this group includes projects aiming at the upgrading of some technical parameters of the line, and in particular loading gauge, siding length and axle load.
- The **upgrade of speed**, enabling enhanced quality of service and a more efficient use of existing capacity

- The **harmonization of capacity**, this group includes those projects related to technological and capacity upgrading as well as upgrading within nodes.
- **ERTMS**

For projects with a cost estimate, the breakdown per country is as follows:

Norway	Number of projects	Benefits of the projects	Costs (Mln €)
Secured	1	Removing infrastructure bottlenecks	3.000
Planned	4	Removing infrastructure bottlenecks	3.000
	2	ERTMS	110
D / R	3	Removing infrastructure bottlenecks	300
Sub-total	10		6.410

Sweden	Number of projects	Benefits of the projects	Costs (Mln €)
Secured	7	Removing infrastructure bottlenecks	6.345
	2	Capacity harmonisation	147
	2	Removing operation bottlenecks	155
Planned	7	Removing infrastructure bottlenecks	5.410
	1	Removing operation bottlenecks	50
	1	ERTMS	620
Sub-total	20		12.727

Denmark	Number of projects	Benefits of the projects	Costs (Mln €)
Secured	4	Removing infrastructure bottlenecks	7.600
	1	Improve traffic performance	1.200
	2	ERTMS ⁴²	
D/R	1	Removing infrastructure bottlenecks ⁴³	
Sub-total	8		8.800

Germany	Number of projects	Benefits of the projects	Costs (Mln €)
Planned	1	Removing infrastructure bottlenecks	900
D / R	1	Capacity harmonisation ⁴⁴	2.600
	1	Infrastructure Bottleneck	1.500
Sub-total	3		5.000

Austria	Number of projects	Benefits of the projects	Costs (Mln €)
Secured	1	Removing infrastructure bottlenecks	4.230
D / R	1	Capacity harmonisation	1.500
Sub-total	2		5.730

⁴² The corridor stretch is part of a national ERTMS and CBTC deployment project to be completed in 2021 and the cost of which is estimated at approx. 2,0 billion€

⁴³ The cost of this project remains to be determined

⁴⁴ See detailed information in Annex VII

Italy	Number of projects	Benefits of the projects	Costs (Mln €)
Secured	5	Capacity harmonisation	371
	2	Removing operation bottlenecks	90
	6	Removing infrastructure bottlenecks	6.072
	5	Improve traffic performance	941
Planned	8	Capacity harmonisation	1.769
	6	Removing operation bottlenecks	383
	20	Removing infrastructure bottlenecks	49.343
	3	Improve traffic performance	290
	1	ERTMS	70
Sub-total	56		59.329

ScanMed RFC	Number of projects	Benefits of the projects	Costs (Mln €)
Secured	19	Removing infrastructure bottlenecks	27.247
	7	Capacity harmonisation	518
	4	Removing operation bottlenecks	290
	6	Improve traffic performance	9.041
	2	ERTMS ⁴⁵	
Planned	32	Removing infrastructure bottlenecks	58.653
	8	Capacity harmonisation	1.769
	7	Removing operation bottlenecks	433
	3	Improve traffic performance	290
	4	ERTMS	800
D / R	5	Removing infrastructure bottlenecks	1.800
	2	Capacity harmonisation	4.100
Sub-total	99		97.996

Table 7: Project breakdown per country and for ScanMed RFC

Infrastructure investment costs on ScanMed RFC are split among the six Member States as follows:

⁴⁵ S. Footnote 42

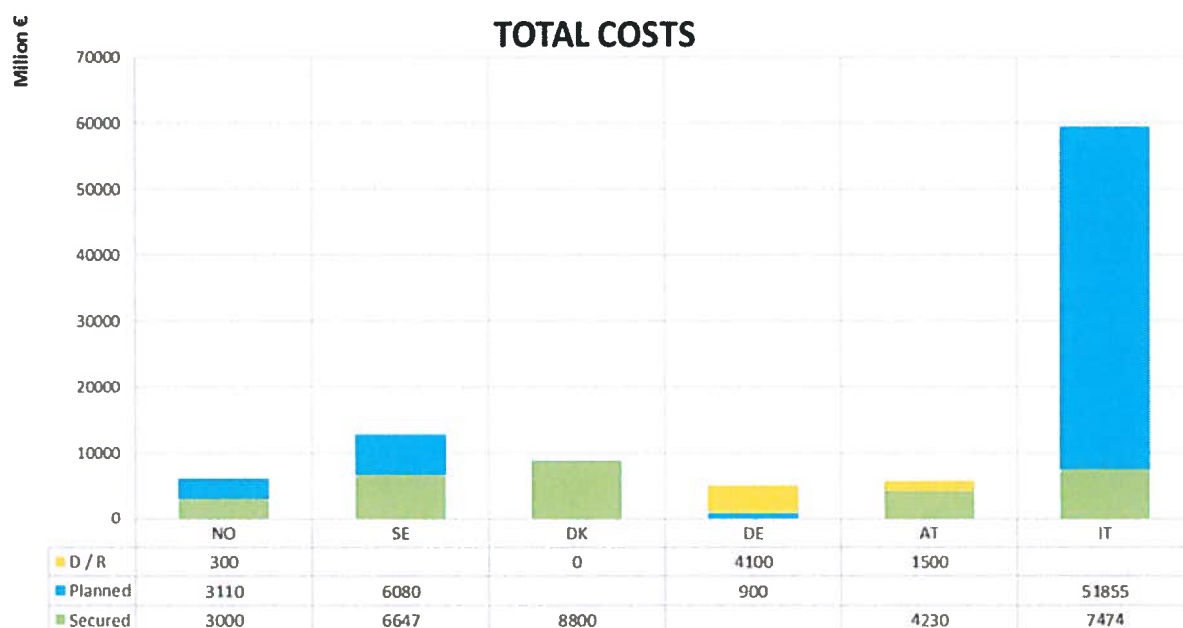


Figure 16: Overview of total costs of corridor-relevant infrastructure projects

VI.2. Plan for the implementation of interoperable systems

Following Art.11 of Regulation (EU) No 913/2010, the Deployment plan for the implementation of the interoperable systems informs on the state of implementation of the Technical Specifications for Interoperability (TSIs) that are relevant for the infrastructure of the ScanMed RFC. These TSIs are:

- Infrastructure (INF)
- Energy (ENE)
- Control-command and signaling (CCS)
- Telematic applications for freight (TAF-TSI)

The reference day is 1st January 2014, meaning that the TSIs valid until this date were taken as a basis for data collection. For the TSIs INF and ENE, those taken as a basis are those applying to conventional rail systems. For the TSIs CCS and TAF-TSI, the present document reproduces the latest status of national deployment plans before publication, whereby the screening of TSI CCS addresses ERTMS. Due to the review of the European Deployment Plan, the ERTMS implementation as set out in this chapter might have to be revised later on. The review is performed under the auspices of the European Coordinator Mr. Karel Vinck as a part of his Breakthrough programme. In search for “a realistic and committed deployment plan” an entirely reviewed European Deployment plan will be issued by the end of 2016 and it is expected to formally replace the current European Deployment Plan.

Data was collected following the methodology:

- **TSIs INFRA and ENE:**
 - Collection of **EC-Declarations of verification**, delivered by a notified body: these concern the corridor sections on which all interoperability parameters required by the TSIs are implemented.
 - Where no such declaration is available, a number of “**significant parameters**” for rail freight operational interoperability were identified among all parameters covered by the TSIs. Are considered as “significant” those parameters which are likely to enable interoperable trains

to run on line sections where they are implemented within the limits of the TSIs, regardless of any statement by a notified body.

▪ **ERTMS and TAF-TSI:**

The IMs provided **essential elements of the indicative national implementation plans**, with the aim of giving an overview of when as well as on which corridor section ETCS and TAF functions can be expected to be available.

The Plan for the Implementation of Interoperable Systems is detailed in Annex X (List of EC-Declarations of verification), Annex XI (State of Play of Significant Parameters for TSI INF), Annex XII (State of play of significant Parameters for TSI ENE), Annex XIII (State of Play of ERTMS Implementation) and Annex XIV (State of Play of TAF-TSI-Implementation). The content of each column reads as described in Paragraphs VI.2.1 to VI.2.4.1

Statement of the Executive Board on the issue of ERTMS

The Member States and Norway have provided national deployment plans for ERTMS and national statements on ERTMS implementation. The presentation of these plans and statements were delivered in order to inform the European Commission about the prospects of the control command and signaling specifications for interoperability as defined in *Directive 2008/57/EC*.

The implementation of ETCS on corridor routes is one of the fundamental goals which led to the creation of the ERTMS Corridors, including Corridor B. In accordance with these goals, each Member State of the corridor notified to the European Commission the detailed timeline for equipping their corridor sections with ERTMS.

Equipping the corridor with ETCS depends on national projects incorporated into national ETCS deployment strategies. These projects did not start at the same time and each project has its own planning. The ETCS deployment realized through these national projects is not limited to corridor sections.

ETCS Level 1 is planned for sections in Germany and Italy. ETCS Level 2 is either planned or already implemented for other sections in Sweden and Germany and sections in Norway and Denmark. The corridor is equipped with ETCS Level 2 on its entire length in Austria. In Italy some sections are in process of planning. Germany concentrates on the first hand on the Rhine-Alpine Rail Freight Corridor / ERTMS Corridor A and some border crossings (both more than 1000 km) to gain experience with the compatibility of different ETCS versions and roll out strategies. For the Scan-Med Corridor this means that the full implementation in Germany will take part at a later stage.

The Implementation plan is based on the current status of each national deployment plan. Please refer to the latest version of these in order to find the correct and up-dated information regarding financing and planning of ERTMS deployment.

Until the deployment of ETCS, railway undertakings have to change their locomotives every time they cross a border between different control-command systems or want to leave the corridor. Alternatively, they can equip these locomotives with multiple on-board control command systems. The first choice has a negative impact on interoperability, travel time, and on rolling stock

management. The second one increases operation costs, and make it more difficult for new operators to enter the market.

With a stable ETCS specification, and compatible products, railway undertakings will be able to use locomotives that can run from the origin to destination with a single on board control command system installed. This will increase interoperability, facilitate asset management, save journey time and reduce costs when it is established. However, during the transition phase from national to European systems significant investments in trackside equipment are required.

When fully established, ETCS will reduce the need to train with the locomotive staff the complete set of rules related to each national legacy system. Other questions of interoperability relating to operational rules and language skills required are still open.

It is evident that the balance between the socio-economic benefits and the costs of ETCS vary considerably among the countries along the corridor as it depends on the characteristics of the legacy control command systems in use and on the very size of the railway net in the corridor countries.

The indicative plan for the implementation of interoperable systems is detailed in Annex XIII (State of play of ERTMS implementation). The content of each column reads as described in Paragraphs VI.2.1 to VI.2.4.1

As mentioned earlier the European ERTMS Coordinator Mr. Karel Vinck has launched a Breakthrough programme on the basis of four principles. The first principle is the “Users first” and not “Designers first” approach that shall facilitate the competitive situation of the Railway Undertakings as users. Secondly, he urges the complete definition of standardised on-board equipment compliant with ETCS Baseline 3. Third principle indicates the entire priority and focus on deployment; finally the system cost reduction for ERTMS shall be one of the main objectives in the upcoming years achieved inter alia through harmonisation of rules. An entirely reviewed European Deployment plan will be issued by the end of 2016 and it is expected to formally replace the current European Deployment Plan.

VI.2.1. General Information

- **Line section:** corridor section, as used for the corridor description (see III.1.), in which the interoperable segment is situated.
- **Sub-section:** sub-section within the line section, if necessary.
- **Length km:** length of the line section or subsection.
- **National track ID, if available:** the national track ID, if available, facilitates the identification of the line sections considered.

VI.2.2. Information specific to EC-Declarations of verification

The list of existing EC-Declarations of verification on corridor sections puts at disposal the following information:

- **Line section to which the EC-Declaration applies:** interoperable segment to which the EC-Declaration of verification applies. This segment is identical with the line section stated on the front page of the EC-Declaration of verification.
- **From [km], to which the declaration applies:** origin, in kilometers, of the line section to which the EC-Declaration of verification applies.
- **To [km], to which the declaration applies:** end, in kilometers, of the line section, to which the EC-declaration of verification applies.
- **Verified [INF/ENE/CCS]:** verified subsystem according to the EC-Declaration of verification.
- **Certificate ID:** the certificate ID facilitates the identification of the EC-Declaration of verification.
- **Date of issue [Month, Year]:** date of issue, in month and year, of the EC-Declaration of verification.

VI.2.3. Information specific to the significant parameters

VI.2.3.1. TSI Infrastructure

- **Structure gauge:** current structure gauge in Gabarit A, B or C. In cases, where there is no exact classification in Gabarit possible, the national structure gauge definitions (as in Austria) or the intermodal freight code (as in Italy) is given.
- **Maximum gradients** of each line section and the corresponding uphill direction (South-North, or North-South).
- **Minimum radius of horizontal curves** on each line section
- **Nominal track gauge** of each line section
- **Cant** on each line section
- **Cant deficiency on plain track and on through route** on each line section
- **In-Service geometry of switches and crossings:** information on whether national limits for In-Service geometry of switches and crossings meet the requirements of the TSI Infrastructure.
- **Maximum unguided length of fixed obtuse crossings:** information on whether the national limits for Maximum unguided length of fixed obtuse crossings meet the requirements of the TSI Infrastructure.
- **Track resistance to vertical loads, Resistance of new bridges to traffic loads- Vertical loads and Resistance of existing bridges and earth works of traffic loads:** information on the category of the line section.

VI.2.3.2. TSI Energy

- **Voltage and frequency** on each line section.
- **Maximum train current** in Ampere [A]
- **Current capacity, DC systems, trains at still stand:** current capacity at DC systems for trains at still stand. This parameter is only applicable if the energy supply system is a DC system.
- **Contact wire height, variation in contact wire height, lateral deviation, pantograph gauge, mean contact force, phase separation sections, system separation sections – Pantograph raised and System separation sections – Pantographs lowered:** information on whether these

parameters meet the requirements of the TSI Energy on each line section. The parameters “System separation sections – Pantograph raised” and “System separation sections – Pantographs lowered” are only applicable if there are two different energy supply systems at the border of two countries (e.g. Denmark 25kV 50 Hz and Germany 15 kV 16,7 Hz).

VI.2.4. Information specific to the Implementation plan ERTMS

VI.2.4.1. Available information

▪ GSM-R, Timeline [Month/Year/in Operation]

Information on the state of implementation of GSM-R. In particular, if not in operation, information is given on the expected timeline of implementation.

▪ ETCS, [Level 1, Level 1 limited supervision, Level 2]

Level of ETCS with which the line section is or will be equipped.

▪ Baseline ETCS

System requirement specification (SRS) following which ETCS is in operation or will be implemented (2.3.0.d or Baseline 3).

▪ Timeline [Year, In Operation]

Information on the state of implementation of ETCS. In particular, if not in operation, information is given on the expected timeline of implementation.

VI.2.4.2. Overview of the implementation timeline per country

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
NO	Alnabru terminal																		ETCS Level 2, go live 2024-2028
	Bryn-Alnabru																		ETCS Level 2, go live 2026
	Loenga-Bryn																		ETCS Level 2, go live 2026
	Loenga																		ETCS Level 2, go live 2026
	Ski-Loenga																		ETCS Level 2, go live 2023
	Moss-Ski																		ETCS Level 2, go live 2023
	Halden-Moss																		ETCS Level 2, go live 2023/2030
	Halden-Fredrikstad																		ETCS Level 2, go live 2030
	Fredrikstad-Moss																		ETCS Level 2, go live 2023
	Tistedal - Halden																		ETCS Level 2, go live 2023
	Kornsjø-Tistedal																		ETCS Level 2, go live 2023

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
SE	Stockholm																		ETCS Level 2, go live 2019-2024
	Stockholm Älvsjö godsbangård - Järna																		ETCS Level 2, go live 2019-2024
	Järna - Katrineholm																		ETCS Level 2, go live 2019-2024
	Katrineholm - Hallsberg																		ETCS Level 2, go live 2019-2024
	Hallsberg																		ETCS Level 2, go live 2019-2024
	Hallsberg - Mjölby																		ETCS Level 2, go live 2019-2024
	Katrineholm -(Mjölby) Nässjö																		ETCS Level 2, go live 2019-2024
	Nässjö-Hässleholm																		ETCS Level 2, go live 2019-2024
	Hässleholm-Lund																		ETCS Level 2, go live 2019-2024
	Lund - Arlöv																		ETCS Level 2, go live 2019-2024
	Arlöv - Malmö Godsbangård																		ETCS Level 2, go live 2019-2024
	Malmö																		ETCS Level 2, go live 2019-2024
	Malmö Godsbangård-Lernacken																		ETCS Level 2, go live 2019-2024
	Malmö Godsbangård-Trelleborg																		ETCS Level 2, go live 2019-2024
	Lernacken-Peberholm																		ETCS Level 2, go live 2019-2024
	Korsjö-Skålebo																		in process of planning
	Skålebo - Öxnered																		in process of planning
	Öxnered - Älvängen																		in process of planning
	Älvängen - Göteborg (Marieholm)																		in process of planning
	Göteborg(Marieholm) - Mölndal Nedre																		in process of planning
	Mölndal nedre - Halmstad																		in process of planning
	Halmstad - Arlöv																		in process of planning
	Hässleholm - Eidsberga																		in process of planning

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
DK	Københavns Lufthavn-Peberholm																		ETCS Level 2, go live 2020
	Korsør-Københavns Lufthavn																		ETCS Level 2, go live 2020
	Nyborg-Korsør																		ETCS Level 2, go live 2020
	Middelfart-Nyborg																		ETCS Level 2, go live 2020
	Snoghøj-Middelfart																		ETCS Level 2, go live 2020
	Fredericia-Snoghøj																		ETCS Level 2, go live 2020
	Taulov-Fredericia																		ETCS Level 2, go live 2020
	Tinglev-Taulov-Snoghøj																		ETCS Level 2, go live 2020
	Padborg border-Tinglev																		ETCS Level 2, go live 2020

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
DE	Flensburg - Rendsburg																		open
	Rendsburg - Hamburg																		open
	Hamburg - Uelzen - Hannover																		open
	Stelle - Lüneburg																		ETCS Level 2, in process of planning
	Hannover - Elze - Edesheim (bei Kreiensen)																		open
	Edesheim (bei Kreiensen) - Göttingen																		open
	Göttingen - Bebra																		open
	Bebra - Fulda																		open
	Fulda - Rieneck Sinnberg																		open
	Rieneck Sinnberg - Gemünden (Main)																		open
	Gemünden (Main) - Würzburg																		open
	Würzburg - Treuchtling - München Nord Rbf																		open
	München Nord Rbf - München-Waldtrudering																		open
	München-Waldtrudering - Kufstein Grenze																		open
	Würzburg - Nürnberg																		open
	Nürnberg - Treuchtlingen																		open
	Nürnberg - Ingolstadt "ERTMS Corridor B"																		open
	Nürnberg Dutzendteich - Nürnberg Reichswald																		ETCS Level 2, go live 2019
	Nürnberg Reichswald - Ingolstadt																		ETCS Level 2, go live 2019
	Ingolstadt - München																		ETCS Level 2, go live 2019
	Maschen - Rothenburg (Wümmme)																		open
	Rothenburg (Wümmme) - Verden																		open
	Verden - Hannover																		open
	Hannover - Almstedt - Edesheim (bei Kreiensen)																		open
	Edesheim (bei Kreiensen) - Göttingen																		open
	Göttingen - Fulda																		open
	Fulda - Burgsinn																		open
	Burgsinn - Würzburg																		open
	Treuchtlingen - Eichstätt																		open
	Eichstätt - Ingolstadt																		open
	München-Karlsfeld - München-Waldtrudering																		open
	Olching - München-Laim																		open

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
AT	(Kiefersfelden) - Staatsgrenze n. Kufstein - Wörgl																		ETCS Level 2, in operation
	Wörgl - Abzweigung Knoten Radfeld																		ETCS Level 2, in operation
	Abzweigung Knoten Radfeld - Abzweigung Fritzens Wattens 2																		ETCS Level 2, in operation
	Abzweigung Fritzens Wattens 2 - Innsbruck Hbf																		ETCS Level 2, in process of planning
	Abzweigung Knoten Radfeld - Abzweigung Fritzens Wattens 2																		ETCS Level 2, in operation
	Abzweigung Fritzens Wattens 2 - Innsbruck Hbf																		ETCS Level 2, in operation
	Innsbruck Hbf - Abzweigung Innsbruck Hbf 1																		ETCS Level 2, in process of planning
	Abzweigung Innsbruck 1 - Staatsgrenze n.Steinach in Tirol - Brennero / Brenner																		ETCS Level 2, in operation
	Abzweigung Fritzens Wattens 2 - Abzweigung Innsbruck Hbf 1																		ETCS Level 2, in operation

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
IT	Brennero - Verona																		ETCS Level 1-2, go live 2020
	Verona - Bologna																		In process of planning
	Bologna - Rimini																		In process of planning
	Rimini - Pesaro																		In process of planning
	Pesaro - Ancona																		In process of planning
	Ancona - Foggia																		In process of planning
	Ancona - Orte																		In process of planning
	Foggia - Bari																		In process of planning
	Bari - Taranto																		In process of planning
	Taranto - Metaponto																		In process of planning
	Metaponto - Paola																		In process of planning
	Bologna - Firenze																		In process of planning
	Firenze - Pisa																		In process of planning
	La Spezia - Pisa																		In process of planning
	Pisa - Livorno																		In process of planning
	Firenze - Orte																		In process of planning
	Orte - Roma																		In process of planning
	Roma - Napoli																		In process of planning
	Napoli - Foggia																		In process of planning
	Napoli - Paola																		In process of planning
	Paola - Gioia Tauro																		In process of planning
	Gioia Tauro - Villa S. Giovanni																		In process of planning
	Messina - Augusta																		In process of planning
	Messina - Palermo																		In process of planning

	ETCS in Operation
	ETCS not in Operation
	Timeframe of implementation
	In process of planning
	Open

Table 8: Timeline of ERTMS Deployment on ScanMed RFC

VI.2.5. Information specific to the Implementation plan TAF-TSI

VI.2.5.1. Available information

The table "Implementation Plan" TAF-TSI encloses the following information:

- **Path request, train preparation, train running forecast, service disruption information, train location and electronic transmission of the documents**

Information on the state of information of each of these functions. In particular, if not in operation, information is given on the expected timeline of implementation.

VI.2.5.2. Overview of the implementation timeline per country

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
NO	Path request																		go live 12/2017
	Train preparation																		go live 12/2018
	Train running forecast																		go live 12/2017
	Service disruption information																		go live 12/2018
	Train location																		open
	Electronic transmission of documents																		open
SE	Path request																		go live 12/2017
	Train preparation																		go live 12/2017
	Train running forecast																		go live 12/2017
	Service disruption information																		go live 12/2017
	Train location																		open
	Electronic transmission of documents																		open
DK	Path request																		go live 12/2017
	Train preparation																		go live 12/2018
	Train running forecast																		go live 12/2017
	Service disruption information																		go live 12/2018
	Train location																		open
	Electronic transmission of documents																		open
DE	Path request																		go live 03/2020
	Train preparation																		go live 01/2021
	Train running forecast																		go live 01/2021
	Service disruption information																		go live 01/2021
	Train location																		go live 01/2021
	Electronic transmission of documents																		go live 01/2021
AT	Path request																		go live 12/2017
	Train preparation																		go live 12/2018
	Train running forecast																		go live 12/2017
	Service disruption information																		go live 12/2018
	Train location																		open
	Electronic transmission of documents																		open
IT	Path request																		go live 06/2017
	Train preparation																		go live 03/2016
	Train running forecast																		go live 06/2015
	Service disruption information																		go live 06/2015
	Train location																		go live 12/2015
	Electronic transmission of documents																		open

	TAF-TSI in Operation
	TAF-TSI not in Operation
	Timeframe of implementation
	In process of planning / early planning stage

Table 9: Timeline of TAF-TSI Deployment on ScanMed RFC

VI.3. Plan for the management of the capacity of rail freight

Capacity bottlenecks

By entry into operation of ScanMed RFC, the following capacity bottlenecks are observed:

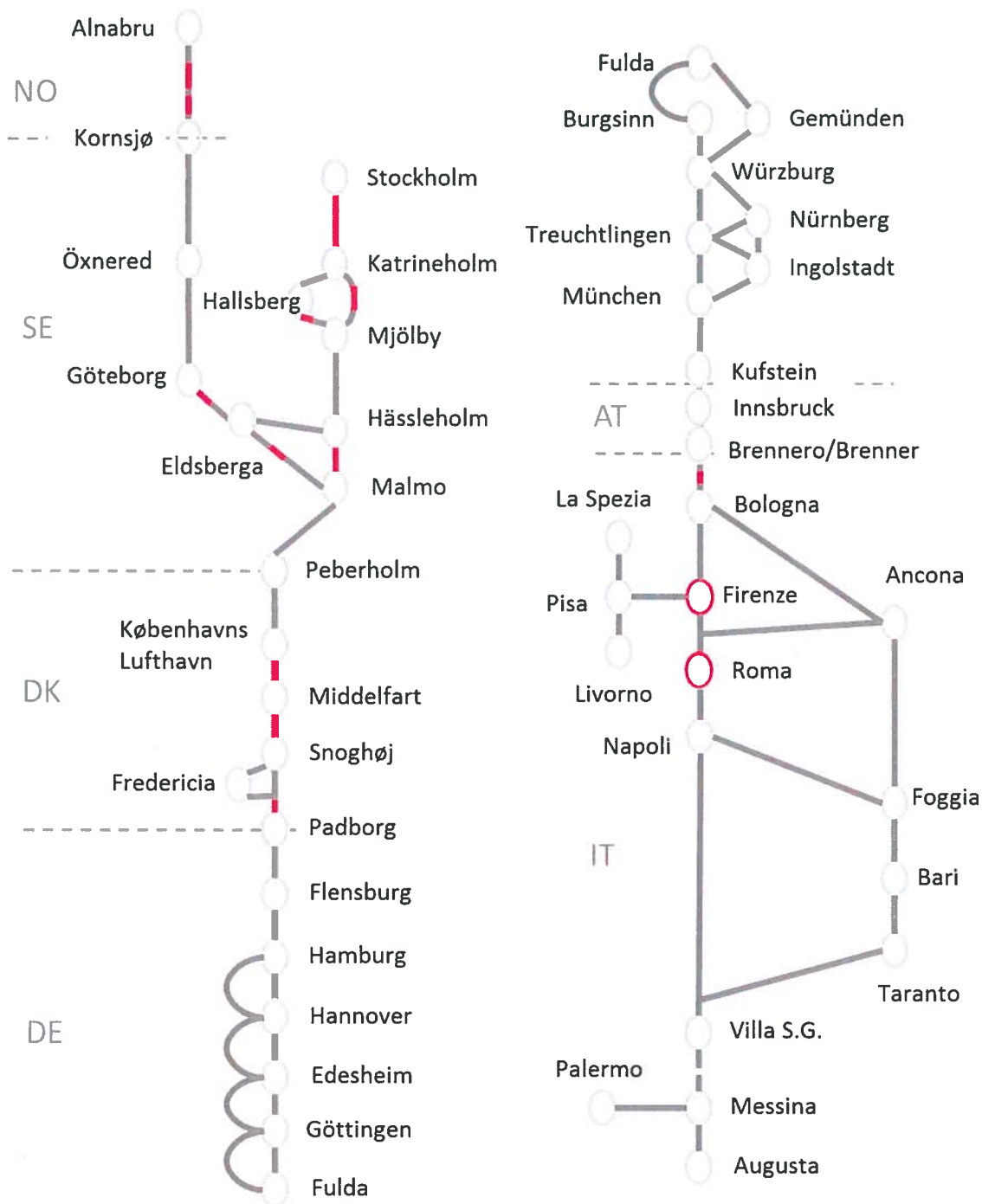


Figure 17: Schematic overview of Infrastructure bottlenecks as of entry into operation (10.11.2015)

The following table shows secured or planned investment projects as well as the associated benefits (see Definition in Chapter VI.1.2.) planned to alleviate capacity bottlenecks between 2014 and 2019

Year	Country	Line Section	Project	Status	Benefits
2015	SE	Båstad-Förlöv	New Tunnel through Hallandsås	Secured	Removing infrastructure bottleneck
2015	SE	Gothenburg central	New signal-box	Secured	Capacity harmonization
2017	SE	Stockholm	New double track in tunnel through central Stockholm	Secured	Removing infrastructure bottleneck
2018	SE	Flemingsberg	Plattform, track 0	Secured	Removing operational bottleneck
2018	DK	København (Ny Ellebjerg)-Køge-Ringsted	New line for 250 km/h (56 km)	Secured	Improve traffic benefit
2018	IT	Brenner Base Tunnel	access Brenner south	Secured	Removing infrastructure bottleneck
2018	IT	Brennero-Verona	adjustment gauge and siding length	Secured	Removing operational bottleneck
2018	IT	Nodo Firenze	upgrading of the node	Planned	Capacity harmonization
2018	IT	Nodo Roma	construction of new routes within the node	Planned	Removing infrastructure bottleneck

Table 10: Investments for alleviating capacity bottlenecks on ScanMed RFC between 2014 and 2019

Further studies may be carried out in future in order to evaluate, in conformity with Art.11.c. of the Regulation, the steps to be taken and their costs for removing bottlenecks in the management of the capacity of freight trains. Such study may focus in particular on upgrading such standards as train length, train weight, loading gauge and axle load.

VII. Key performance indicators (KPIs) and monitoring

VII.1. Quality

VII.1.1. Definition

Quality is understood here in terms of punctuality and in number of days the C-OSS needs to answer a customer's request. Corridor trains are defined as trains running on a path allocated by the C-OSS, whereby performance monitoring may be extended beyond and cover international freight trains not running on a path yet at least on a corridor cross-border section.

VII.1.2. Monitoring

Key Performance indicators

Quality indicators are both quantitative and qualitative.

- Quantitative indicators are
 - the punctuality level measured as percentage of representative trains (PAPs and further agreed trains) running within a punctuality threshold on defined points (1)
 - delay caused by the IMs (2)
 - the number of working days necessary to the C-OSS to answer questions of customers (3).
- The corridor customer's satisfaction survey will provide a qualitative assessment (4)

Monitoring methods

- **Indicators (1) and (2):** The general approach of punctuality monitoring and the analysis of delay causes will follow a four step process involving both IMs and RUs:
 - Step 1: Establish the list of trains to be monitored
 - Step 2: Gather punctuality and delay root causes on for the monitored trains
 - Step 3: Deliver punctuality reports
 - Step 4: Analyze and define possible improvement options

Steps 1 and 4 will be carried out in two regional groups, the Brenner Group and the North ScanMed Reliability Group, composed each of the relevant IMs and Railway undertakings operating the sections.

Steps 2 and 3 will be carried out by the IMs involved in ScanMed RFC. Data collection will be done using TIS. The punctuality reports will be produced using a template developed by RNE.

As regards Step 2 in particular, performance monitoring must take into account the existing traffic flows on the corridor. The logistic inter-relations and dependences being rather complex, the analysis on ScanMed RFC will focus on a set of relevant train runs.

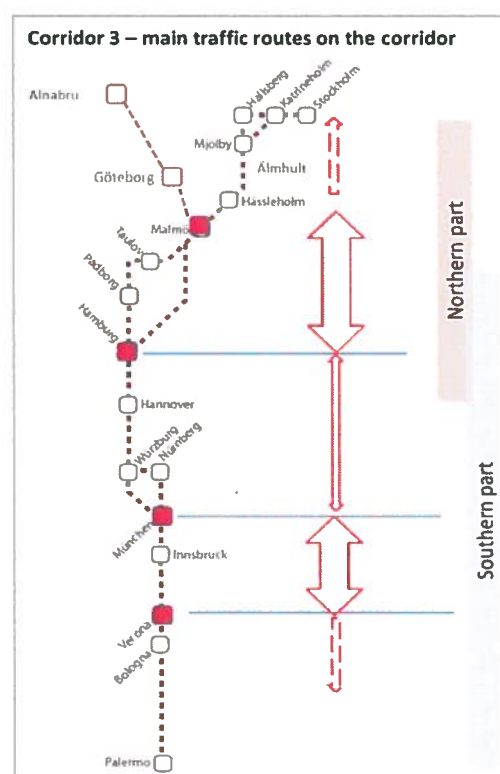


Figure 18: Scope overview of Traffic Performance monitoring on ScanMed RFC

In general, two major traffic flows exist, which connect the Malmö area to Hamburg-Maschen and Munich to Verona. A significant number of trains further leaves or enters the corridor on different points along ScanMed RFC.

Quality is measured for selected trains, the list of which is defined together with the Brenner Group and the North ScanMed Reliability Group, and checked by the IMs involved following a criteria of corridor representativity. Trains running on Pre-arranged train paths are planned to be monitored as soon as possible.

Performance monitoring will give an overview of quality at representative points of the corridor by displaying punctuality, in percentage of trains passing the measuring point within 30 minutes from schedule.

- **Indicator 3:** the number of working days needed to the C-OSS to respond to a customer's request will be registered by the C-OSS itself. The report of the C-OSS will be assessed against the results of the Customer Satisfaction Survey.

VII.2. Capacity

VII.2.1. Definition

Capacity designates in the present document corridor capacity. It encloses national and cross-border segments of Pre-arranged paths (PaPs) as well as reserve capacity slots constructed after X-4. It reflects the utilization of offered corridor capacity with respect to total capacity on a given line section.

VII.2.2. Monitoring

Key performance indicators

Capacity indicators are quantitative and can be listed as follows:

- Number of offered PaP-Segments at X-11
- Number of requests for PaP-Segments at X-8 (in % of total PaP-Segment offered)
- Double booking of PaP-Segments at X-8
- Number of allocated PaP-segments (in % of total PaP-Segment offered)
- Offered Reserve Capacity
- Allocated Reserve Capacity

Monitoring methods

The C-OSS will be in charge of collecting the basic information for each KPI mentioned above. PCS will be used as IT-support.

VII.3. Availability

VII.3.1. Definition

Availability is understood here as the possibility for ScanMed RFC customers to operate a corridor train on principal and diversionary routes with a high performance of the existing infrastructure.

VII.3.2. Monitoring

Availability monitoring will focus on the alleviation of infrastructure bottlenecks. It will be assessed through regular updates of the Investment Plan.

VIII. Measures

VIII.1. Coordination of possessions

VIII.1.1. Definition

Following Art.12 of Regulation (EU) No 913/2010, information on works and possessions will be published on the website of ScanMed RFC in a coordinated manner and on CIP as soon as available.

Coordination will follow the RNE Guidelines on the coordination and publication of works and possessions⁴⁶, published on 6th November 2013⁴⁷.

Whereas works are understood as any kind of maintenance or engineering works on the infrastructure and its equipment, possessions are defined as *“Times when parts of the infrastructure are used by the IM in order to manage the infrastructure. The reasons may be any activities of the IM on the infrastructure or its equipment (e.g. maintenance, repair, renewal, enhancement, construction).”*⁴⁸

The intention of Art.12 being the provision of coordinated information on capacity restriction, it will be applied to possessions rather than to works.

VIII.1.2. Criteria for the possessions to be published

All possessions impacting corridor capacity will be published. Impacts are:

- Reduction of speed, weight and train length
- Track closure
- Line closure involving re-routing

VIII.1.3. Process and timeline

Coordinated information on possessions will be gathered using an MS-Excel based corridor map and table. The document will be published on the website of the ScanMed RFC.

The process and timeline of coordinated information on possessions are described in Book 4 Chapter 8 of the Corridor Information Document.

VIII.2. C-OSS

VIII.2.1. Competences

Following Art.13 of Regulation (EU) No 913/2010, the IMs involved in ScanMed RFC will set up a joint body acting as single point of contact for corridor capacity request. The competences of the C-OSS will be shared between core, promotion and monitoring tasks, for which the IMs will also bring relevant input.

Competences of the C-OSS	Contribution of the IMs
C-OSS Core competences	
<ul style="list-style-type: none"> ▪ PaPs and Reserve Capacity <ul style="list-style-type: none"> – Monitoring of PaPs construction – Publication (Corridor website, PCS) – Sales and allocation ▪ Publication of information on works and possessions (Corridor website) 	<ul style="list-style-type: none"> ▪ Hand-over of the decided number of coordinated PAP sections at X-12 ▪ Cooperation in the construction of coordinated feeders and outflow paths and of tailor-made offers in case of conflicting requests ▪ International coordination an update of information on works and possessions ▪ Designation of a or several dedicated contact persons for all recurring tasks ▪ Information of the C-OSS on approvals of RUs and Applicants ▪ Update of the available Reserve Capacity
C-OSS Promotion competences	
<ul style="list-style-type: none"> ▪ Communication on the Corridor's offer 	<ul style="list-style-type: none"> ▪ Construction of competitive PaPs meeting

⁴⁶ Please note that the information provided should be used for rough orientation purposes only and may not constitute the basis for any legal claim. Publication of possessions does not substitute any national law or legislation and RUs/applicants must refer to national Network Statements.

⁴⁷ http://www.rne.eu/tl_files/RNE_Upload/Downloads/RFC%20Guidelines/Guidelines%20for%20Coordination-Publication%20of%20Works%20and%20Possessions.pdf

⁴⁸ RNE Guidelines on the coordination and publication of works and possessions, p.4 and 5

<ul style="list-style-type: none"> ▪ Knowledge transfer for the use of PCS ▪ Support to the customers for placing a request 	<ul style="list-style-type: none"> ▪ expectations of the customers ▪ Frequent support of corridor managers and/or national OSS towards the customers
C-OSS Monitoring competences	
<ul style="list-style-type: none"> ▪ Collection of data for KPI-Monitoring 	

Table 11: Competences of the C-OSS and contributions of the IMs

VIII.2.2. Processes

The C-OSS will use PCS for its core function and the website of the ScanMed RFC for promotion and monitoring.

The processes applied by the C-OSS are described in Book 4 Chapter 3 of the Corridor Information Document.

VIII.3. Allocation of capacity

VIII.3.1. Principles

Following Art.14 of Regulation (EU) No 913/2010, Corridor Capacity will be allocated in the yearly timetable in form of Pre-arranged train paths (PaPs) and in form of Reserve Capacity after X-4.

Further details are provided in the Framework for the Allocation of Capacity (Annex V) and in Book 4 of the Corridor Information Document⁴⁹.

VIII.3.2. Priority rules

Priority rules are in the course of being harmonized in a multi-corridor manner.

VIII.4. Authorized applicants

Following Art.15 of Regulation (EU) 913/2010, *“applicants other than railway undertakings or the international groupings that they make up, such as shippers, freight forwarders and combined transport operators, may request international pre-arranged train paths (...) and reserve capacity (...).”*

Further information on the access of Applicants to Corridor Capacity can be found in:

- the Framework on the allocation of capacity
- Book 4, Paragraph 3.2. of the Corridor Information Document

VIII.5. Traffic Management

VIII.5.1. Cross-border traffic management

All existing operational cross-border regulations are updated or in the course of being updated according to bilateral agreements already reached. The resulting update of procedures between neighbouring Infrastructure Managers either has taken place or is underway.

VIII.5.2. Traffic Management in case of disturbances

Following Art.17 of Regulation (EU) No 913/2010, ScanMed RFC delivered Guidelines for Traffic Management in case of disturbances. The guidelines are published in Book 4 Chapter 7 of the Corridor Information Document.

⁴⁹ As the consultation process with the Advisory Groups Railway Undertakings and Terminals as well as with the Applicants started, the FCA for Timetable 2017 had not yet been adopted.

A disturbance is defined as any unplanned occurrence impacting operations negatively, i.e. producing a reduction of capacity.

These guidelines:

- Describe the general operational proceedings in case of disturbance for the ScanMed RFC. In particular, it provides a state of play of international information systems already in use.
- Set principles that the existing bilateral cross-border agreements between the IMs must relate to. The guidelines have no legally binding value that would add to the existing cross-border agreements. However, the existing bilateral agreements will be checked against these principles on a yearly basis.
- Provide, in an annex, contact details at the IMs involved with the aim of facilitating the return to regular traffic conditions in the event of disturbance impacting hand-overs at cross-border points.

VIII.6. Corridor Information Document (CID)

VIII.6.1. Structure

In accordance with Article 18 of the Regulation the Management Board shall publish a document, containing the procedures for the management of the freight corridor, hereinafter referred to as the Corridor Information Document ("CID"). In order to preserve a recognition effect and to facilitate access to comparable information from one RFC to another, the CID of ScanMed RFC will follow the RNE Guidelines⁵⁰. The CID is structured in five books:

- Book 1: Generalities
- Book 2: Corridor-relevant excerpts of national network statements, as delivered according to Art.27 of Directive 2012/34/EU
- Book 3: Description of terminals
- Book 4: Procedure for capacity and traffic management
- Book 5: Implementation Plan

The 1st CID is published on 10th November 2015 and expresses the entry into operation of ScanMed RFC according to Regulation (EU) No 913/2010. For this first CID, Book 2 will be based on network statements published in December 2014 and applying to timetable 2016. A second CID is due to be published in January 2016 with excerpts of the network statements which will apply to the timetable 2017.

⁵⁰ http://www.rne.eu/tl_files/RNE_Upload/Network%20Statements/Corridor%20Statement/Specification%20-%20Corridor%20Information%20Document%20V1.4.pdf

IX. Annexes

The present Implementation Plan encloses the following annexes:

- **Annex I** - Mission Statement of the Executive Board of 2nd June 2012
- **Annex II** – General Objectives of ScanMed RFC
- **Annex III** - Agreement on the Establishment of the Management Board of Rail Freight Corridor 3 of 30th August 2012
- **Annex IV** – Cooperation frameworks between the Management Board and the Advisory Groups Railway Undertakings and Terminals
- **Annex V** - Framework for the Allocation of Capacity (FCA)⁵¹
- **Annex VI** - Common Declaration of the European Rail Freight Corridors for their cooperation in facilitating the RFC network (RFC Club)
- **Annex VII** - List of Corridor-relevant investment projects
- **Annex VIII** – Description of technical parameters of the infrastructure “*as-is*” by entry of operation
- **Annex IX** – Description of technical parameters of the infrastructure realized and planned
- **Annex X** - List of EC-Declaration of Verifications
- **Annex XI** - State of play of significant parameters for TSI Infrastructure
- **Annex XII** – State of play of significant parameters for TSI Energy)
- **Annex XIII** - State of play of ERTMS implementation (ETCS and GSM-R)
- **Annex XIV**- State of play of TAF-TSI implementation
- **Annex XV** – Cooperation Framework for Executive Board and Management Board, Rail Freight Corridor 3

The Annexes displayed in zip-files:



Annexes 1-15.zip

⁵¹ As the consultation process with the Advisory Groups Railway Undertakings and Terminals as well as with the Applicants started, the FCA for Timetable 2017 had not yet been adopted. The FCA will be added as Annex V to the implementation Plan as soon as available.