MARKET PLACE SEMINAR

INLAND HUBS: KEY TOWARDS
RAIL FREIGHT
CORRIDOR DEVELOPMENT

Transcontinental corridors inter-connecting with RFCs

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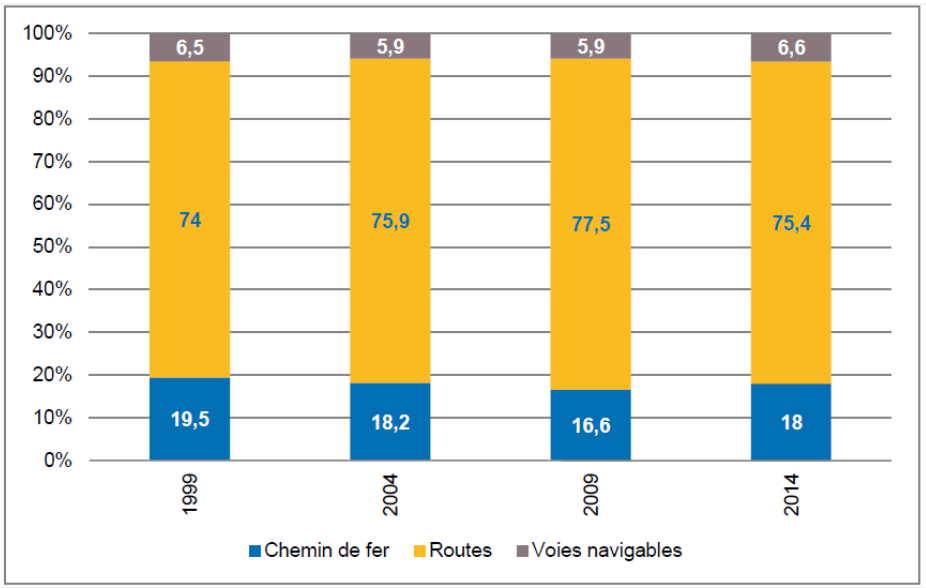
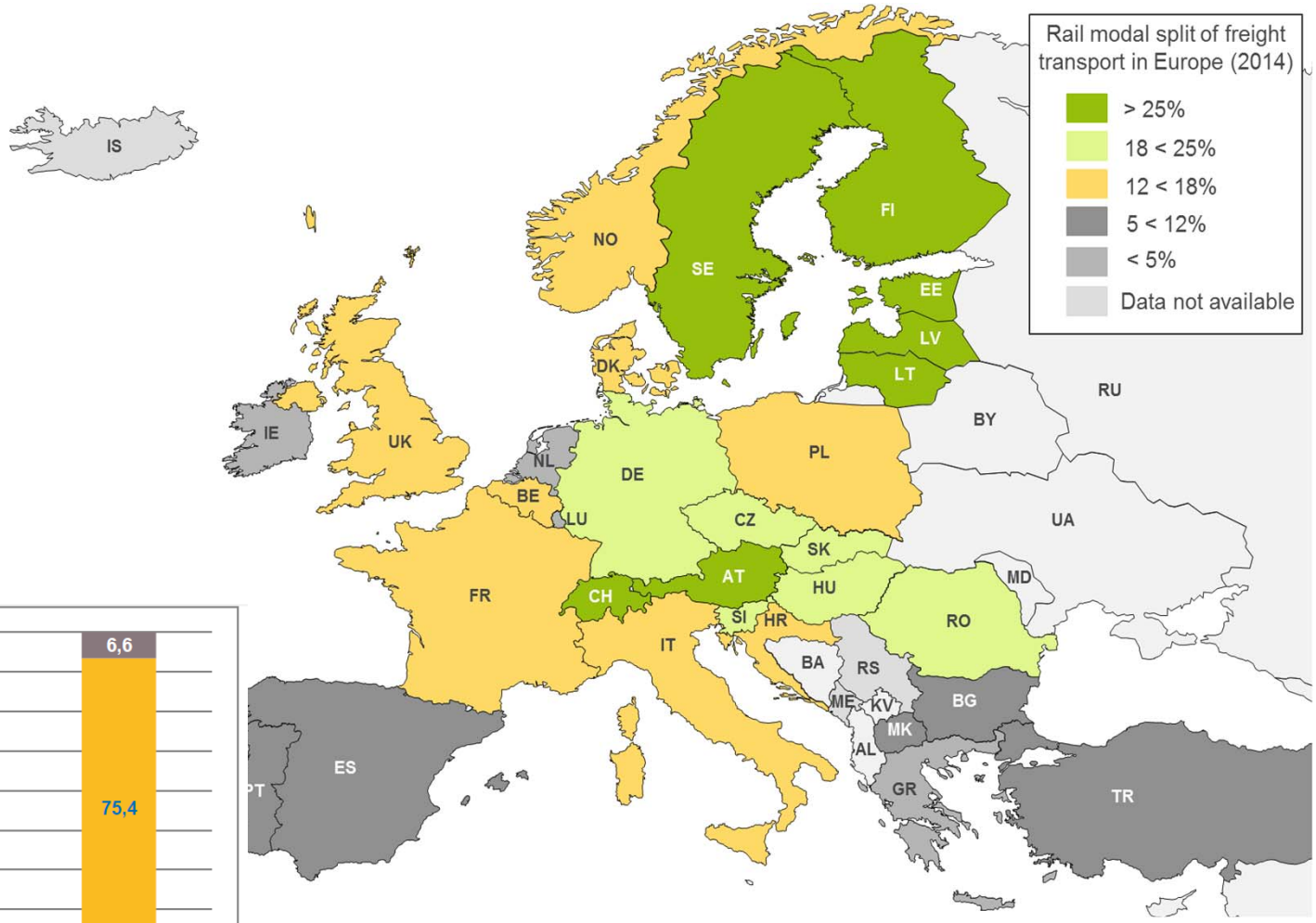
DUISBURG, GERMANY
14-15 SEPTEMBER 2017

Rail freight in Europe



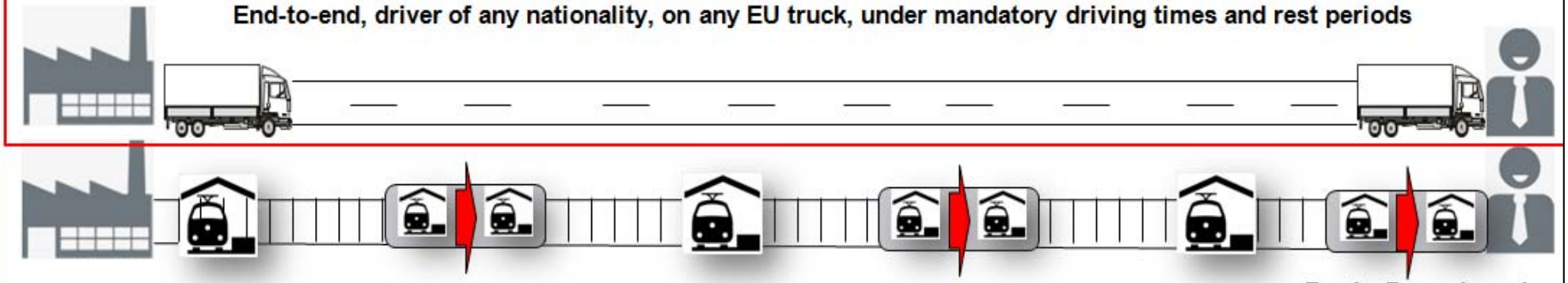
Source: Statistical pocketbook 2016, Eurostat



Source: BSL Transportation analysis, for UIC 2016 Report on Combined Transport

High operational and financial efforts are necessary to enable a smooth European transport on rail

End-to-end, driver of any nationality, on any EU truck, under mandatory driving times and rest periods



Netherlands

- For the formation of the **train, different operating regulations** of all the involved countries must be considered: braking rules, length + weight
- **The standard is the lowest length/weight** of train of any of the involved countries
- The locomotive must be equipped with the Dutch **train control system ATB and ETCS (costs 400- 500.000 €)**

Border Emmerich

- Change of loco and loco driver

or:

- Loco admission for Germany + equipped with German train control system PZB/LZB
- Language skills of **German level B1 (costs 20.000 €)**
- Training of loco driver in **operational knowledge for Germany + drivers license** (costs 20.000 €)

Germany

- Higher costs for non-noise reduced wagons
- Costs for retrofitting of **1.700€ per wagon**

Border Basel

- Change of loco and loco driver

or:

- Loco admission for Switzerland
- Training of loco driver in **operational knowledge for Switzerland + drivers license** (costs 20.000 €)

Switzerland

- ETCS equipment of Netherlands is not compatible with ETCs Switzerland
- **Loco needs Swiss ETCS and Swiss train control system ZUB** (costs 400.000 € per loco)
- Loco needs Swiss pantograph (smaller)

Border Domodossola

- Change of loco and loco driver

or:

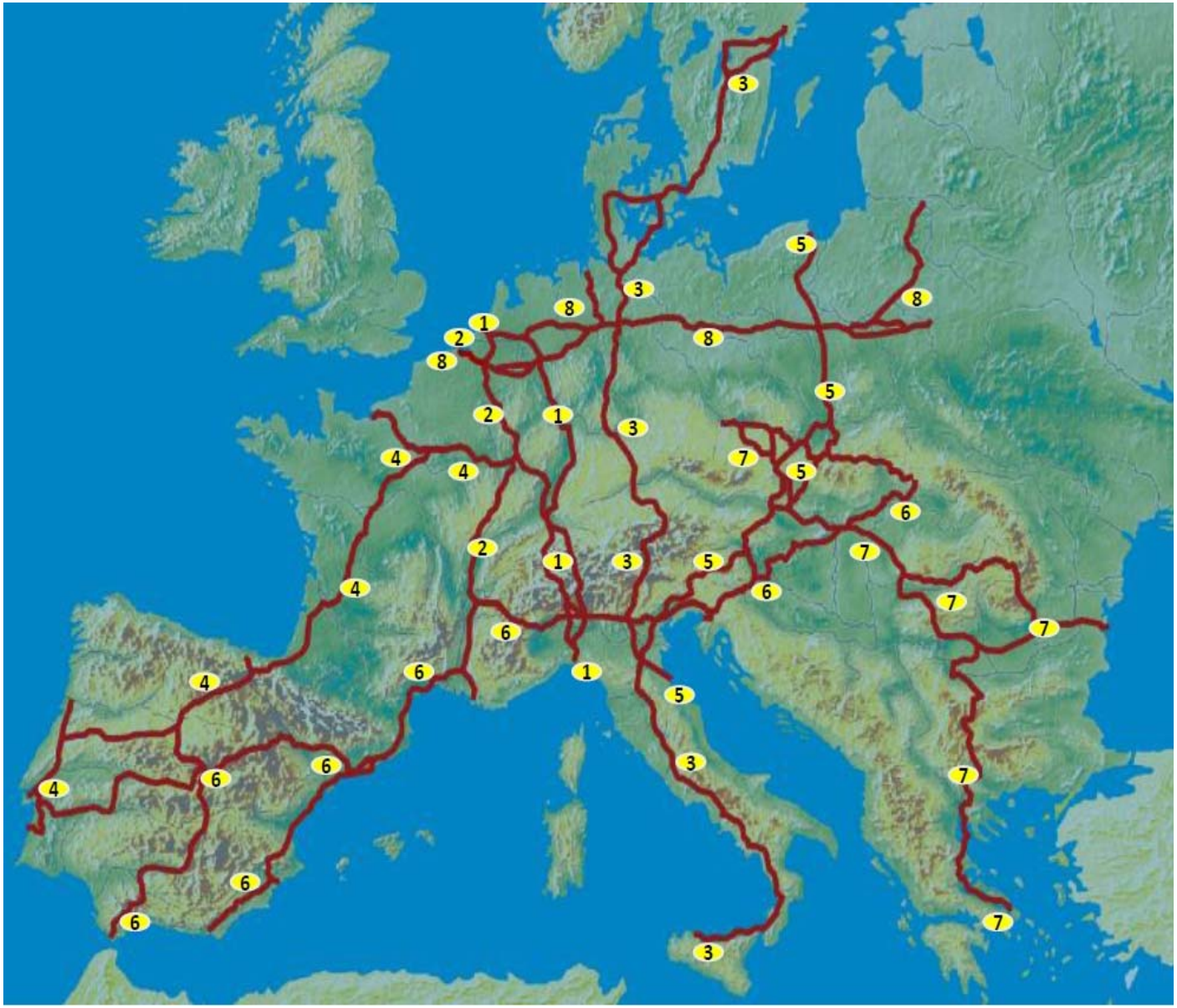
- Loco admission for Italy + equipped with Italian train control system SCMT
- Training of loco driver in **opera-tional knowledge for Italy +drivers license**
- Language skills of **Italian level B1**
- **Two loco drivers** in Italy required
- Length of train max. 540m

Source DB Cargo

Corridors: a tool to boost European rail freight…a challenge

EU n°913/2010
Defines, on 9 initial corridors, rules for the:
-Selection
-Organization
-Management
-Indicative investment planning
-etc.

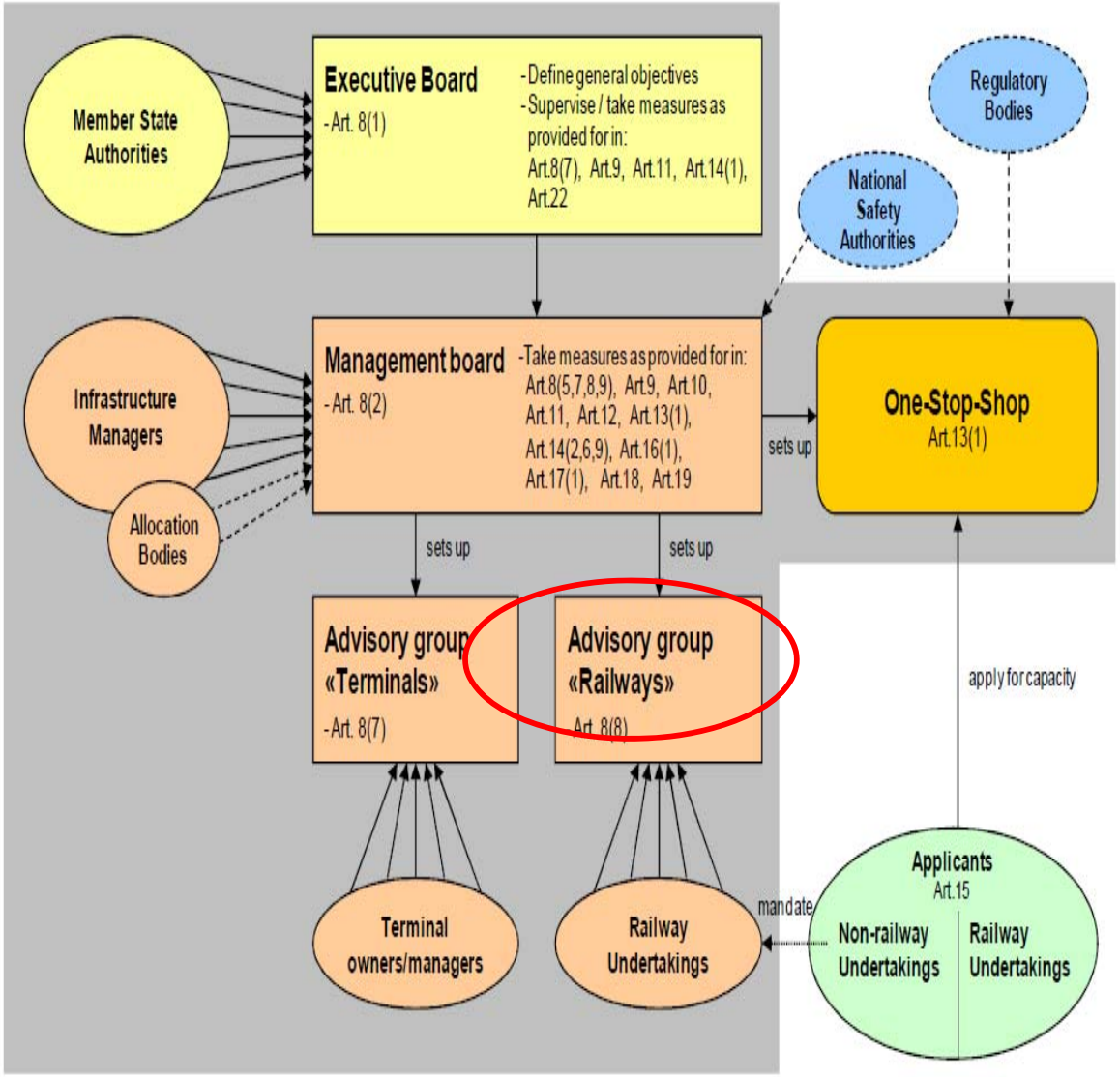
NO COORDINATION BETWEEN CORRIDORS REQUIRED BY LEGISLATION



ECCO project

Efficient Cross Corridor Organisation

- Coordination
- Harmonization
- Standardization
- Monitoring



- ✓Increased operational efficiency
- ✓Reduced costs
- ✓Improved interoperability
- ✓Improved reliability
- ✓Improved customer satisfaction

Implementation strategy

IM tasks

RAG

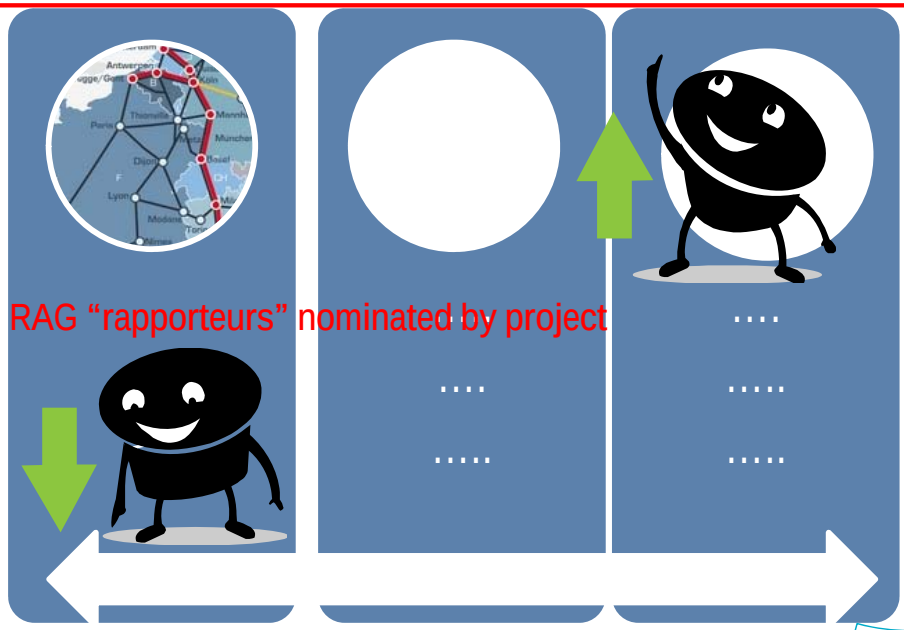
RAG

RAG

....9 in total

EEIG

RU / Operational Tasks



RAG "rapporteurs" nominated by project

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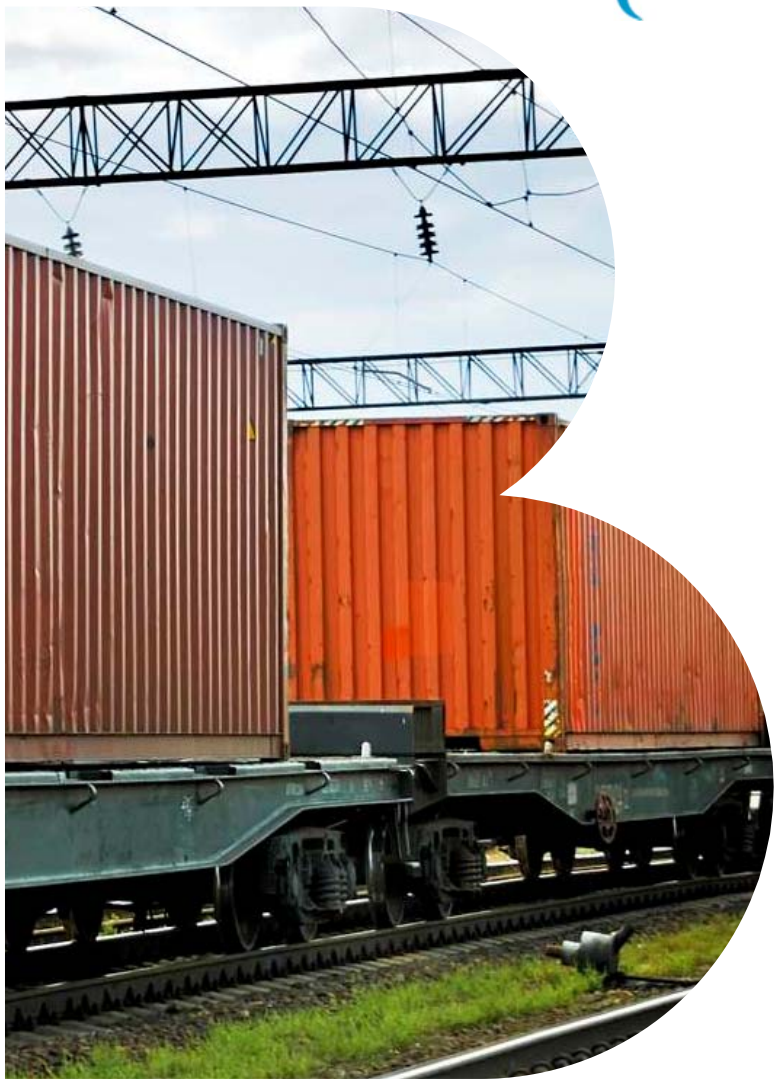
Project steering committee
UIC back office

- Extracting and consolidating RU consensus points
- Establishing priorities

Input for Sector Statement… the EU barometer to measure sector ability to organise itself

Priority Action	Caretaker	Current Status	CEO TF & ECCO link
1. Redesign of International Timetabling (TTR)	Kroll/RNE	The project is in the endorsement phase. General Assembly approval in May (RNE) and June (FTE).	P11-12: Timetabling and PCS
2. New concepts for capacity offer	Sellnick/ RFC	RFCs and RNE work on improving quality of capacity offer.	P05/06 (NEW): RFC Structure/C-OSS Input from ECCO on C-OSS and path allocation
3. Improving coordination on temporary capacity restrictions (TCR)	Kroll/RNE	The first TCR WG will take place in April 2017. Results will be reported once available.	P11-12: Timetabling and PCS P13: Coordination of infrastructure works
4. Enhance use of Path Coordination System (PCS)	Kroll/RNE	Update of evaluation of Empty Envelope Concept in April. The RNE GA in May 2017 will further address PCS issues.	P11-12: Timetabling and PCS
5. Improving the harmonisation of processes at border-crossing sections	Hartkopf/ DB Cargo	Working will be carried out in cooperation with the ECCO group and could focus on: safety certification, locomotive authorization, drivers certification, rules for languages	P2: Cross border P4: International Authorisation of Rolling stock UIC project on Xborder quick wins ECCO group
6. Train tracking & ETA information	Toet/KNV Schulze/ UIRR	CEF funding application for pilot trains submitted in February 2017. Ministries and EC/ERA checking legal requirements. Prepare implementation phase.	P10: Traffic Management
7. Monitoring TEN-T parameters on RFCs/ IMs	Maier/BLS	Activity to start mid 2017: collecting facts and figures on current situation and planned action.	P08: Standardised parameters UIC project on quick wins
8. Following ETCS implementation	Simonnet/ CER	Waiting for the EDP development	P01: ETCS
9. Monitoring the quality of freight services (KPIs)	Pitnik/RCA Kroll/RNE	Ongoing discussions between RU Dialogue/ECCO and RNE. Implementation expected for 2018. First results expected in 2019.	CEO TF & RU Dialogue (supported by ECCO)
10. Harmonising the Corridor Information Document	De Mol/ RFC	RNE will address Regulatory Bodies at the RNE/RB conference beginning of April to support the common structure on national level.	P05&06: RFC Structure/C-OSS (ECCO to monitor progress)

Eurasian rail corridors: what opportunities for freight stakeholders?



The study assesses the viability and the actions needed to promote existing and South-Eurasian routes and their connection to RFCs

Background and project objectives

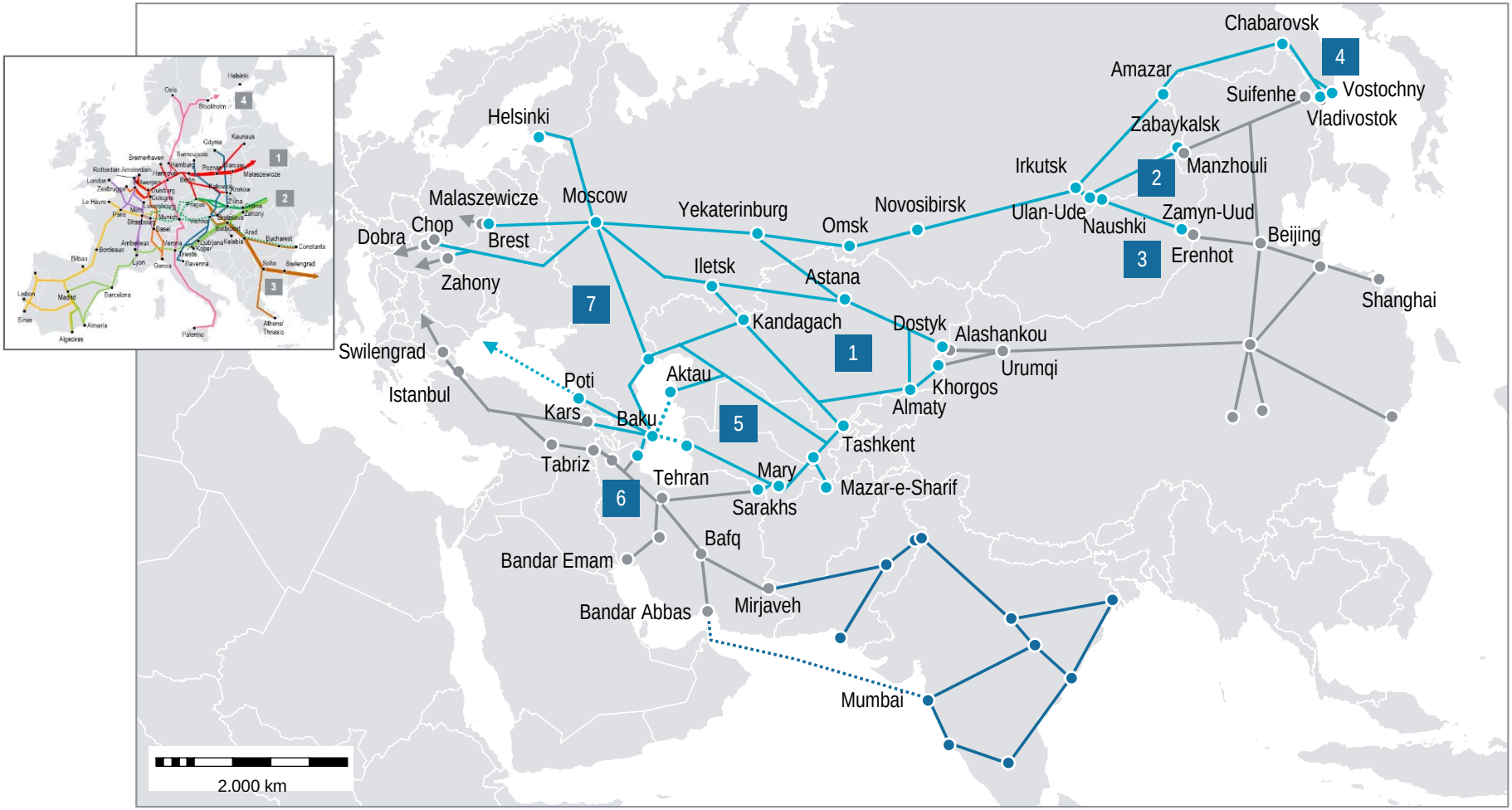
- With the continuing economic development, cargo traffic flows between Asia and Europe are expected to increase
- Rail transport on the Asia-Europe route is increasing as well but its share stays small. Disadvantages regarding border crossings, reliability, infrastructure and other factors are still holding it back. Dropping sea freight rates aggravate the competition with sea freight
- Nevertheless, business initiatives to improve the competitiveness and quality of rail transport are growing on the Northern Eurasian rail routes and, more recent, on the Southern routes
- Especially China, Iran and Turkey are investing and promoting the Southern infrastructure links to Europe along the former Silk Road trading routes
- At the same time, Europe is investing in its cargo rail by creating common standards for the interoperability of networks in the nine Rail Freight Corridors and the Trans-European Transport Networks

Assessment of the viability of the Eurasian rail freight routes, with a focus on Southern routes and the interconnection with European Rail Freight Corridors

1. Overview on the traffic volumes, market players, infrastructure and performance of the rail routes – forecasting their development and potential until 2027
2. Assessment of key success factors, best practices and impeding factors for the initiatives
3. Recommendations for stakeholders on how to improve/reset their business activities and market the new alternatives as well as migration plan for UIC to support its members

In addition to the Europe-Asia routes in place in North Asia, new routes via Iran and Turkey are developed for rail freight

Main Eurasian routes with track gauge (schematic)[1)]

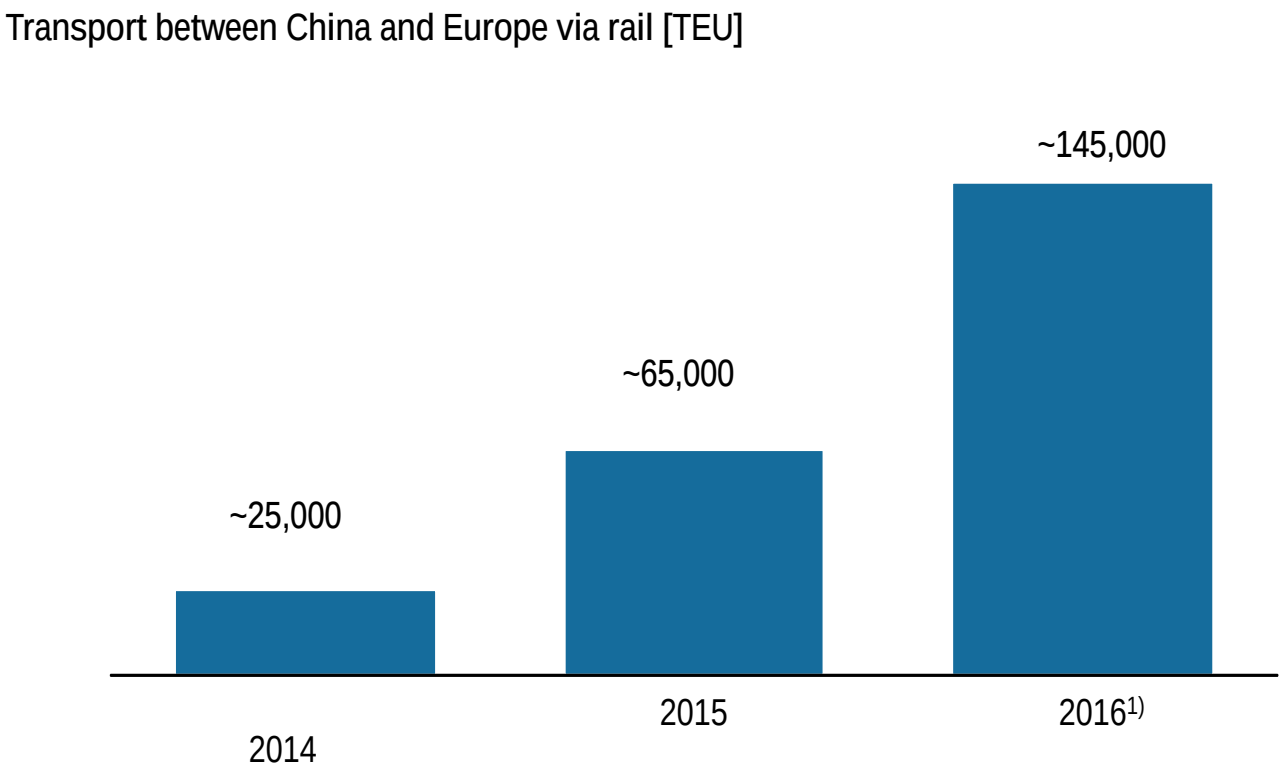


1) Conical projection to minimize visual distortion of distances; numbering based on route usage for Eurasian rail freight transport

Source: UNESCAP, Roland Berger

Eurasian rail cargo transports have grown significantly, but still have a low intermodal market share

Development of rail freight between Asia and Europe



1) Roland Berger calculations based on interviews with several players, e.g. DB Cargo, TEL

Source: EATL, DB Cargo, CRIMT, press research, Roland Berger

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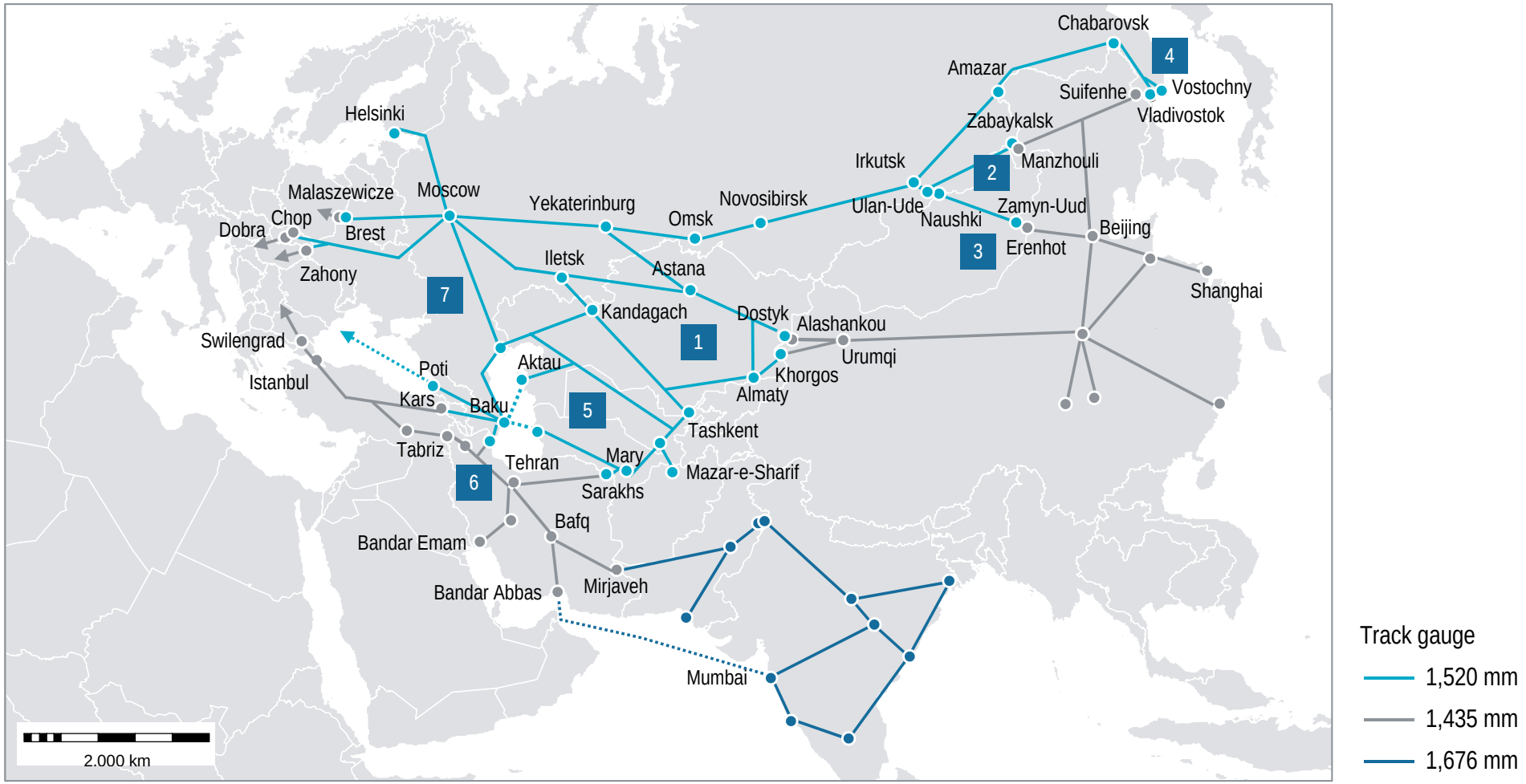
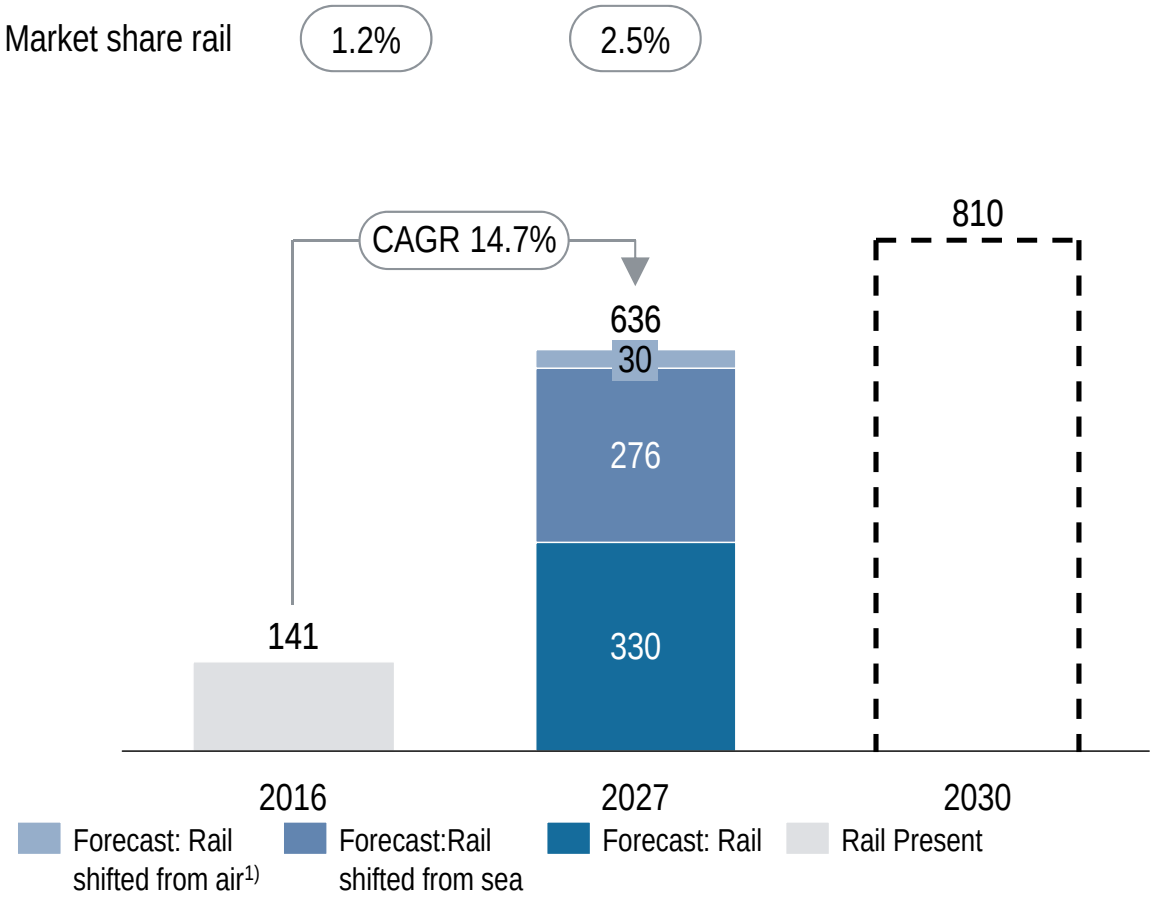


1) Conical projection to minimize visual distortion of distances; numbering based on route usage for Eurasian rail freight transport

Source: UNESCAP, Roland Berger

For 2027, a total rail potential of around 636,000 TEU is forecasted – Significant amount coming from shift from sea

Rail potential base case forecast ['000 TEU]



1) Rough estimate based on shift factors of 5% from overall Asia-Europe air traffic 2) Length of an European train

- Total rail potential includes
  - Existing rail volumes increasing over time
  - Shift from sea to rail, including growth of sea transport
- Shift from Air as potential, but small (in terms of volumes) upside
- 636 k TEU can roughly be translated into 21 trains per day in 2027 (assumption: 82 TEU per trains[2)])
- Due to separate analysis TEU volumes of South Asia, Turkey and Iran trade with EU 28 not included
- Extrapolated forecast until 2030 shows a total rail freight volume of 810 k TEU

Source: Eurostat, RB Model, Roland Berger

Timing and reliability stay key success factors – Operations have improved but market still sees more potential

Prioritization of parameters – Analysis of interviews

Parameter	Importance for rail link	Gap 2017[1)]	Changes since 2011 and comments
Transport time			> Speed gains of approx. two days since 2011 > Gaps seen mostly inside Europe (slow transportation, delays)
Reliability			> Rail now more reliable than sea > Especially shippers still see need for improvement and more information
Balanced quantities			> Continuously smaller eastwards transport volumes, changing only slowly > Alternatives like stepwise returns make transport more complicated
Target goods			> Suitable goods are targeted and LCL offers were introduced > Still potential in chemicals, temperature controlled goods and air freight
Price			> No pure price competition but more competition through low sea freight rates > Potential for more cost efficiency and less dependence on subsidies
Frequency, flexibility			> Frequency increased strongly in last years > Many trains are still on request instead of regular trains
Target geogra-phical coverage			> Network has increased in past years > Next step should be consolidation for more efficient geographical coverage
Availability			> Imbalance of traffic complicates return of platforms/containers
Customs			> Improvements in customs in the last years, partly seen as "solved problem" > More potential at Chinese border and through electronic documentation

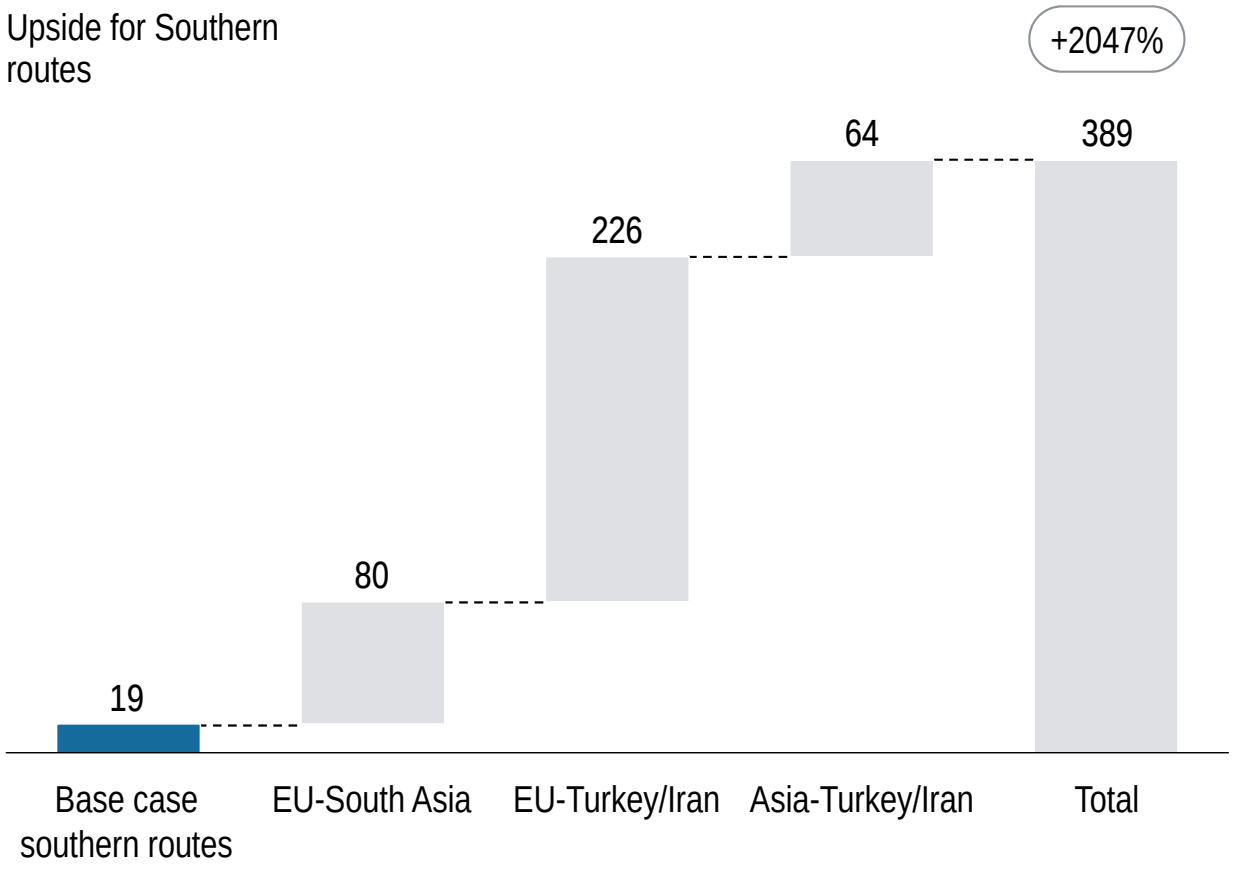
Legend: Higher filling of harvey balls shows higher importance; higher filling of gap shows higher gap, direction of arrow shows progress since 2011 (upwards = positive, downwards = neg.)

1) Gap depicts overall view of established and therefore in general addresses Northern routes, progress arrow can be flat/negative if expectations have risen at the same time as results

Source: Expert interviews, Roland Berger

The traffic on the Southern routes would reach 389,000 TEU, if other expected international traffic is accounted for as upside

Upside scenarios 2027 ['000 TEU]



Forecast

> India, Pakistan and Bangladesh rail freight traffic could be forecasted based on same method as O/Ds through Eurostat database

> Turkey and Iran traffic calculated in both directions to Europe and Asia[1)]

Preconditions for upside scenario

> Ensuring price competitiveness with sea transport as time advantage decreases with closer proximity

> Addressing issues of security and trans-border shipments, customs and bureaucracy

> Economic growth and political stability in Iran, Turkey, as well as between India and Pakistan

1) Rough Turkey-Asia forecast based on data in USD provided by Turk Stat and applying average values identified through Eurostat

Source: Eurostat; Turkstat, RB Model

The traffic potential for 2027 on the Southern routes is projected to 19,000 TEU corresponding to 3% of Eurasian rail traffic

Trade volume distribution 2027 ['000 TEU]

Origin and destination (O/D) countries

Methodology

> Countries identified as preferred partners for Eurasian rail freight through South Routes: Bulgaria, Greece, Romania,

> Calculated share of 3% of forecasted EU 28 GDP for 2027

Preconditions for upside expansion case

> Higher infrastructure capacity is needed to make Eurasian rail freight possible in bigger quantities and requires further investments on Southern routes

> Shorter transit times as well as lower rail prices for international transit is necessary to make Southern Routes competitive, especially in Turkey, and requires a clear political will

Source: Oxford Economics Global Economic Database, RB Model

Gaps are larger for Southern routes and have to be overcome to establish a viable Southern alternative

Evaluation of success factors for Southern routes (Silk Road and TRACECA[1])

Parameter	Importance for rail link[2]	Gap 2017	Comments regarding Southern Routes
Transport time			> Speed slower than Northern routes (e.g. 17-20 days China-Turkey) > Long distance, more border crossings/customs or mode changes
Reliability			> No established regular services yet > Trial services TRACECA (DHL 2016) with delays of more than 4 days each
Balanced quantities			> Smaller eastward transport volumes are expected > Need to examine possibilities for stepwise transports
Target goods			> Target goods in European O/Ds for Southern routes (East Europe) and in new O/Ds (Turkey, Iran) need to be specified and seasonality considered
Price			> Even bigger competition from sea freight through shorter distance and good accessibility of Middle East and East European countries > High network costs in Iran and Turkey
Frequency, flexibility			> Routes not established as regular services yet
Target geogra-phical coverage			> Routes not established as regular services yet
Availability			> Routes not established as regular services yet
Customs			> Many transit countries are not part of a customs unit (Ukraine, Iran, Azerbaijan and Turkmenistan)

Legend: Higher filling of harvey balls shows higher importance; higher filling of gap shows higher gap

1) Transport Corridor Europe-Caucasus-Asia 2) Same importance as for general Eurasian transport

Source: Expert interviews, Roland Berger

Four European RFCs directly relevant for Eurasian rail transport – Only Malaszewicze/Brest with significant volume today

Schematic map of RFCs[1)]

Interconnection points of routes from Asia to European Rail Freight Corridors

1. Malaszewicze – Brest (RFC8)
2. Cierna (Dobra) – Chop (RFC9) and Zahony – Chop (RFC6)
3. Swilengrad – Kapikule (RFC 7)
4. Via Stockholm (RFC 3)

European Rail Freight Corridors[2)]

- RFC 1: Rhine – Alpine
- RFC 2: North Sea Mediterranean
- RFC 3: Scandinavian – Mediterranean
- RFC 4: Atlantic
- RFC 5: Baltic – Adriatic
- RFC 6: Mediterranean
- RFC 7: Orient – East Mediterranean
- RFC 8: North Sea – Baltic
- RFC 9: Rhine – Danube or Czech – Slovak[3)]
- RFC 11: Amber[4)]

1) Schematic map does not include all potential RFC connections, sections in the focus of this study shown by bold lines 2) Initiatives regarding RFC 10 exist, but no official implementation decision 3) Only the part Cierna to Prague implemented, other routes to be implemented by 2020 3) To be launched in 2018

Source: Austrian Ministry for Transport, Innovation and Technology, RNE, Press Research, Roland Berger

The focus of operators and railways should be on operational efficiency and on customer-friendly product development

Recommendations for operators and railways

Streamline operations

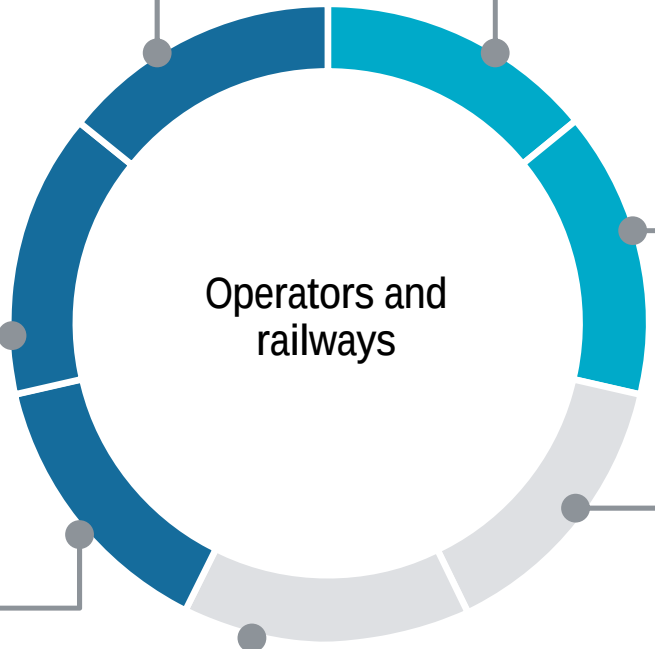
> Negotiate efficient border/terminal operations
> Tackle punctuality problems and minimize locomotive/driver changes in Europe
> Optimize cost structure for sustainability without subsidies

Participate in new opportunities

> Target and develop products for trends, e.g. e-commerce, temperature-controlled goods

Use new regions as steps to Asia

> Market transports to/from Central Asia to China as options for stepwise increasing traffic



Improve information/transparency

> Share information on arrival times
> Track reliability and use big data tools to optimize operations

Broaden services

> Increase share of regular trains
> Develop sets of additional services

Communicate infrastructure needs/ client expectations in Europe

> Communicate infrastructure needs/client expectations for international traffic
> Improve market orientation of RFCs

Evaluate and develop Silk Road markets

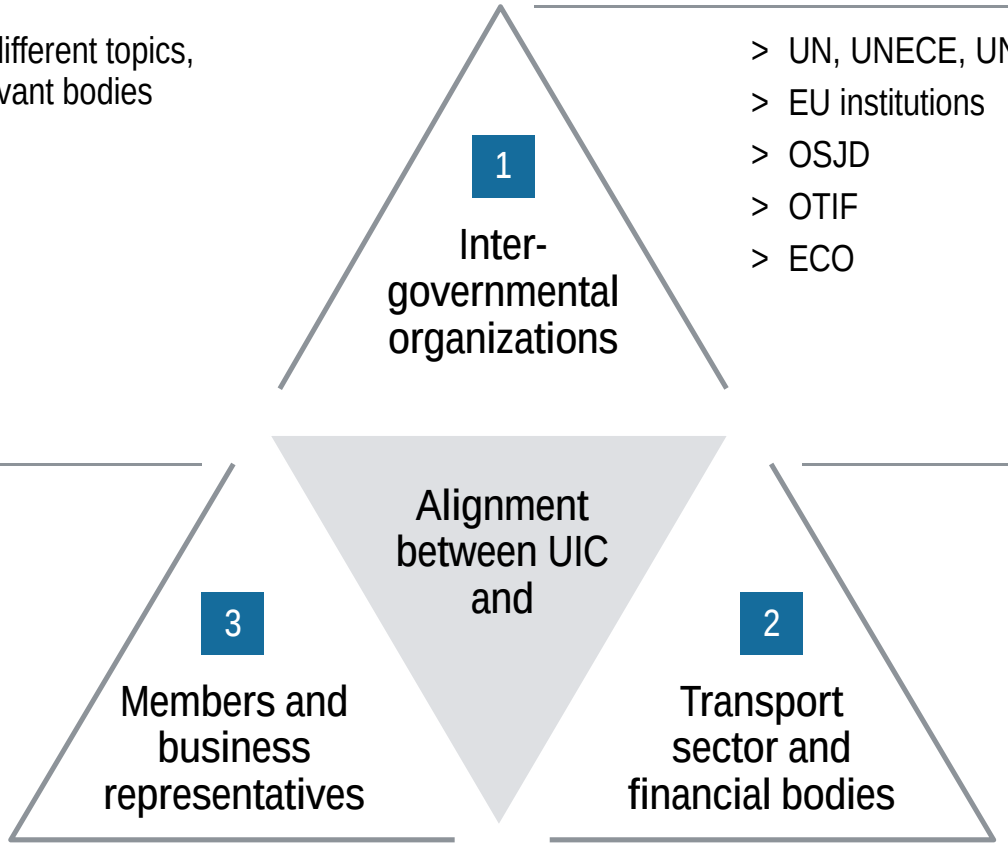
> Implement measures to improve service quality on Southern routes
> Research market potential of South Asian & Middle Eastern economies

Action fields: Operations | Customer expectations | Regional actions

Strong alignment of UIC work with other working bodies needed to spread knowledge and positively impact international rail freight

Recommendations for the UIC – Collaboration

Cooperation has to be tailored to different topics, activities and regions – not all relevant bodies can be named here



- UN, UNECE, UNESCAP
- EU institutions
- OSJD
- OTIF
- ECO
- BSEC
- EEC
- CIT
- etc.

- RFCs
- ADB
- CAREC
- TRACECA
- etc.

- Freight Forum
- Regional Assemblies
- BIRC
- CCTT
- Representatives from business
- etc.

Border crossing – International Railway Corridors (BIRC working group), Coordinating Council on Transsiberian Transportation (CCTT), Economic Commission for Europe (UNECE), The Economic and Social Commission for Asia and the Pacific (UNESCAP), Organization for Cooperation of Railways (OSJD), Intergovernmental Organization for International Carriage by Rail (OTIF), Economic Cooperation Organization (ECO), Back Sea Economic Cooperation (BSEC), Eurasian Economic Commission (EEC), International Rail Transport Committee (CIT), Asian Development Bank (ADB) , Central Asia Regional Economic Cooperation (CAREC), Transport Corridor Europe-Caucasus-Asia (TRACECA)

Thank you for your attention