Improving European Railways

Rail corridor assesment evaluation of the route, obstacles and opportunities

Phil Mortimer

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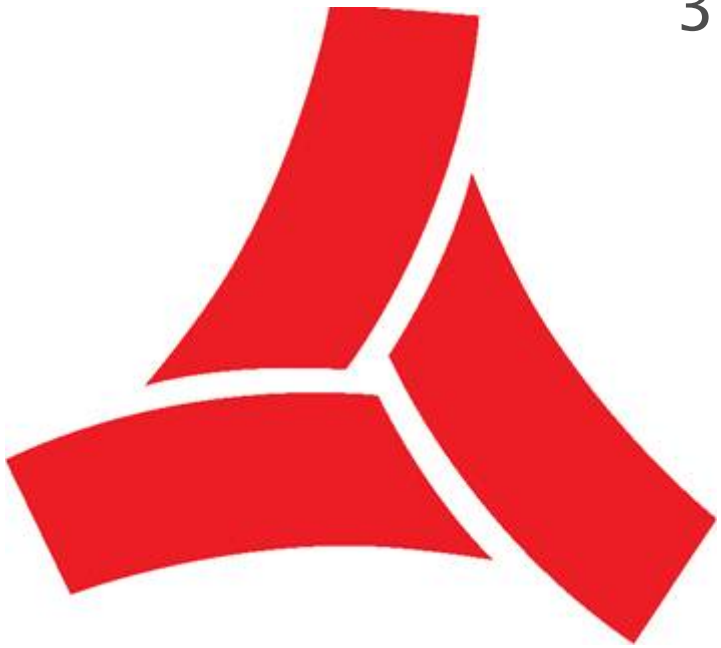


retrack

An Integrated EU-Project

BACKGROUND

- European rail freight
  - National monopoly in the far and near past;
  - Small continent but many countries?
  - But rail focuses on longer transport haul?
  - Subsidised rail operation?
  - Neglect in investment for modernasition
  - Delayed liberalisation?
- Current situation- EC Reform packages/ directives since mid-1990s
- EC Aspiration
  - modal shift
  - Sustainable but competitive market
  - Strong and commercial rail freight sector
  - Co-modal transport policy, lastly?
- RETRACK Project to introduce a commercial rail freight service on the Rotterdam-Constantza corridor

INTRODUCTION TO WP2

- To conduct a state-of-the-art on European rail services in the corridor;
- Research effort included
  - In-depth literature reviews of best practices, EC funded relevant projects, technology development throughout EC, and
  - Field visits to stakeholders including terminals, ports, rail regulators, rail freight operators (as many as 50) on the corridor.

Transhipment Techniques

- We have differing inland and port terminals in our corridor;
- We have different types of cargo units
  - ISO, non-ISO, Swap bodies, and trailers;
- Inland terminal handles both ISO and continental containers
- Port terminals are dominated by ISO containers;
- Some inland terminals are dedicated to ISO units.

Terminal Operation

- We need appropriate actions from at least three actors:
- Terminal operator
  - Terminal design, layout, skilled personnel and alternative handling equipment/ technique
  - Inland/ maritime terminal
  - Flexibility to meet customer demand and partnership
- Rail operator
  - Improved rolling stocks
  - Complementary forms: direct, shuttle, feeder, hub-spoke
  - Alternative technology
- Road operator
  - Time savings at terminal gate – on-time arrival with all documents – most terminals have already achieved
  - Overall – improved quality of service – most important

ICT on Retrack corridor

- The interviews with the different railway companies have shown:
  - The core Processes Marketing / Sales & Distribution, Order Management, Planning and Dispatching, Maintenance Management, Production data acquisition – operation control, Controlling, Accounting / issuing invoices are done by using individually developed systems and office products.
  - All operators have high level of manually done tasks with MS Office
  - IT systems that integrates all core processes does not exist (RAIL4CHEM has the most integrated software Infrastructure)

ICT Requirements

- For effective communication systems we need to
  - define a common order structure and a common data exchange format.
  - request for resources (e.g. locomotive, wagon, personnel) to each other when required.
  - establish a uniform view on common used resources.
  - That means all companies need consistent systems for planning and scheduling trains. Furthermore, an important part of the future IT strategy must be seen in the exchange of production data of the train runs between the partners.

Terminal technology and systems

- Terminal handling equipment types
  - Cranes,
  - Horizontal transport means and
  - Assisting systems
- Cranes for loading and unloading of containers
  - Gantry: single trolley crane and dual –trolley crane (new)
  - Span several rail tracks
- Cranes for stack yard
  - Rail mounted (RMG)
  - Rubber tyred gantries (RTG), and
  - Overhead bridge cranes (OBC)
- Horizontal transport means
  - Passive vehicles – unable to lift by themselves – trucks with trailer, multi-trailers,
  - Active vehicles– lift containers – straddle carriers, fork lift
- Assisting systems: communication and positioning system
  - EDIFACT, Global Positioning Systems (GPS), differential GPS

Terminal layout and design

- Terminal Planning and Operation
  - Size, throughput and degree of automation
  - Train/ship operation, transhipment and truck movement
  - Modules- gate and truck monitoring, yard planning, ship stowage planning, rail planning, container packing information, customs access, EDI, equipment monitoring and performance reporting.
- Current working procedure
  - Management process line –bilateral contractual
  - Planning process line – arrival/ departure time, path allocation
- Terminal security issues
- Terminal capacity current and future expansion

Summary on Terminal

- Majority of terminals use very orthodox terminal technologies;
- Terminals have developed their own individual approaches to container handling, transfer of containers between modes and stack or storage areas;
- Terminal can be closed-in creating a proper working environment;
- The ability to handle ISO, European sized units, swap bodies and road trailers would be of great interest and most of the terminals inspected to date have that capability.

Safety & Security

- The scope of the present study concerns the safety & security issues related to **transported goods**;
- Thus the study focused on the freight/cargo and his environment without developing the security aspect related to the rail system (rail infrastructure, signalling, power supply, trains are out of scope);
- In terms of **dangerous goods** transport, the study focused on security aspects, assuming that the safety measures according to regulation are fully applied;
- Rail transport security faces new **threats** from international terrorism which are **not well defined.**
- The most likely modes of attack: robbery, assaults and trafficking illegal substances (CBRNE) and immigrants.

Cargo Security Obligations

- Risk management vs. mandatory 100% screening;
- After approval of the US Congress (July 2007), president Bush has officially signed the new law "H.R.1 – Implementing Recommendations of the 9/11 Commission Act of 2007". The main measure concerns the 100% screening of containers to US. This makes freight "Risk" assessment associated to transport mode of high importance and European transport system will have impact;
- Known/ Unknown Shipper rules (security regulations) will be mandatory;
- *World Customs Organization's SAFE Framework to secure and to facilitate the ever-growing flow of goods. It incorporates the concept of the Authorized Economic Operator (AEO)* .

Approach on Safety & Security

- Identification and characterisation of risks and threats related to transport goods (in particular dangerous goods);
- Identification of vulnerabilities/ threats along the route/ transport chain, for each country/ region;
- Identification and characterisation of singular points and routes throughout the supply chain;
- Clear definition of functional, operational and environmental conditions that the detection and identification systems must fulfil;
- Determination of the associated procedures, the required reactions and modes of intervention.

Train Operating Parameters

- Three current systems on the corridor:
  DC 1,5 kV on the old line and AC 25kV, 50 Hz on the Betuwe line in the Netherlands.
  AC 15 kV, 16.7 Hz in Germany and Austria
  AC 25 kV, 50 Hz in Slovakia, Hungary, and Romania.
- The main routing of the corridor is completely electrified
- In each country a dedicated national signalling system is used. The new European ETCS level 2 will be only established on Betuwe line. Dedicated line sections within the corridor countries will be switched to the new European ETCS level 1 (Austria/Hungary, Romania).
- A locomotive to operate on the complete corridor would have to be compatible with at least two current systems.
- The maximum train capacity is limited by the eastern part of the corridor:
  Line category C2 and maximum train length of 600 m and restrictions for single traction (775t) in parts of Romania.

Draft Concept Train Parameters

- Possible Terminal stops:
  Neuss (Germany), Worms (Germany), Nürnberg (Germany), Enns (Austria), Vienna (Austria), Bratislava (Slovakia), Budapest (Hungary), Brasov and Bucarest in Romania.

  A separate set of wagons from and to Bratislava could be connected with a shuttle service from and backwards to Vienna.
- 2 times weekly - both directions
  roundtrip 1:
  southbound: departure Rotterdam: Sunday; arrival Constanza: Thursday
  northbound: departure Constanza: Friday; arrival Rotterdam: Wednesday
  roundtrip 2:
  southbound: departure Rotterdam: Wednesday; arrival Constanza: Sunday
  northbound: departure Constanza: Monday; arrival Rotterdam: Sunday.
  realistic transit time: 104 hours (A-E)

- Train parameters

  max. gross weight / max.length:

Rotterdam – Nürnberg:	1.800 t / 650 m
Nürnberg – Brasov:	1.600 t / 650 m
Brasov – Bucarest:	1.425 t / 560 m
Bucarest – Constanza:	1.075 t / 420 m
Vienna – Bratislava:	800 t / 300 m

  max. operational speed:
  100 kmh in the Netherlands; Germany; Austria and Hungary
  80 kmh in Romania
  max. axle load 20 t

Draft Concept Train Parameters

- Rolling stock
  wagons:

  A) container wagons: 8 units 60´ Sggmrs, 90´ Sggmrs and 3 units 104´pocket wagons Sdggmrs

  B) conventional train: 29 units covered wagons Habins

  C) defined number of wagon sets due to substitution for maintenance and ability for flexible usage

  Locos:

  Bombardier TRAXX F140 AC or Siemens ES64F4 between Rotterdam via Betuwe line and Nürnberg.
  Two ES64U2 “Dispolok Bosporus Sprinter” between Nürnberg and Constanza.
  Shuttle service for separate set of wagons between Vienna and Bratislava.
  Additional operation of a banking locomotive (basic locomotive in Romania: Electroputere EA060) between Brasov and Predeal (Romania) due to the restriction of 775 t for single traction.
- Estimation of operational performance (kilometric):
  wagons: 140.000 – 180.000 km/a
  locomotives: 180.000 – 220.000 km/a

Legislative framework

- All countries visited on the proposed Retrack Corridor line of route
- All ministries directly involved with transport at a national level visited & interviewed
- All existing rail regulatory bodies visited & interviewed
- Infrastructure owner/manager/operators visited and interviewed
- Other relevant agencies also visited and interviewed (RNE/OSS)
- Interface with national competition authorities, customs authorities but not as complete a picture
- Emergent issues already developing at an EU level which the Retrack project will need to maintain a watching brief on. (e.g. cross acceptance, deletion of bilateral positions on customs checks at borders etc.

Open Access to the network

- Open access is an option in the rail freight market on the corridor
- To ensure a level playing field without discrimination
- Currently securing train paths, routing, schedules and days of operation is less transparent
- There are differences in functions, duties and mechanisms of interference
- There is no common model although components are common
- Degrees of intervention, competence and experience are mixed.
- Processes are still evolving in Hungary & Roumania

Summary of Legislative issues

- A mixed array of structures, mechanisms and effectiveness
- Nominal protection measures exist in Retrack corridor
- Evolving positions in Hungary & Romania
- NL & Germany have sophisticated arrangements
- Austrian RR is less overt and uses a different approach which limits powers of intervention
- High profile issues on rail service pricing in Austria and other overt measures to distort the market despite the frameworks in place
- German RR intervention on pricing and commercial issues may prove interesting.
- Retrack will need to keep up to speed with evolving national developments (MAV sale etc) and the evolving regulatory environment for implications on the whole route and service project

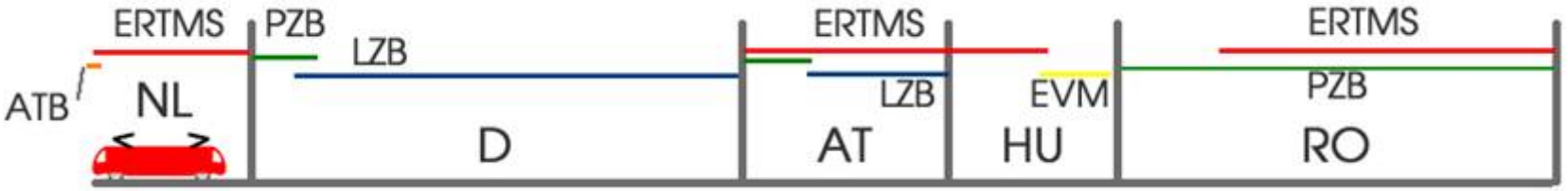
Infrastructure Issues

- To identify key issues on the various national networks on the Retrack corridor in relation to train length, speeds, weights and other pertinent limitations.
- To assess the mechanisms for securing train paths for demonstration and sustained longer term train operations
- To assess the capabilities of national terminals for their ability to handle cargo on any new train services operated.
- For this, interviews undertaken with infrastructure managers and operators on the Retrack corridor

Summary of Infrastructure Issues

- Short term port congestion and access issues being resolved and will synchronise with Retrack (2008/2009)
- Ports concerned about congestion and options to use rail for their commercial and operational advantage particularly using block trains
- Routine and reliable transit time issue is key across Romania for Retrack.

Command Control systems

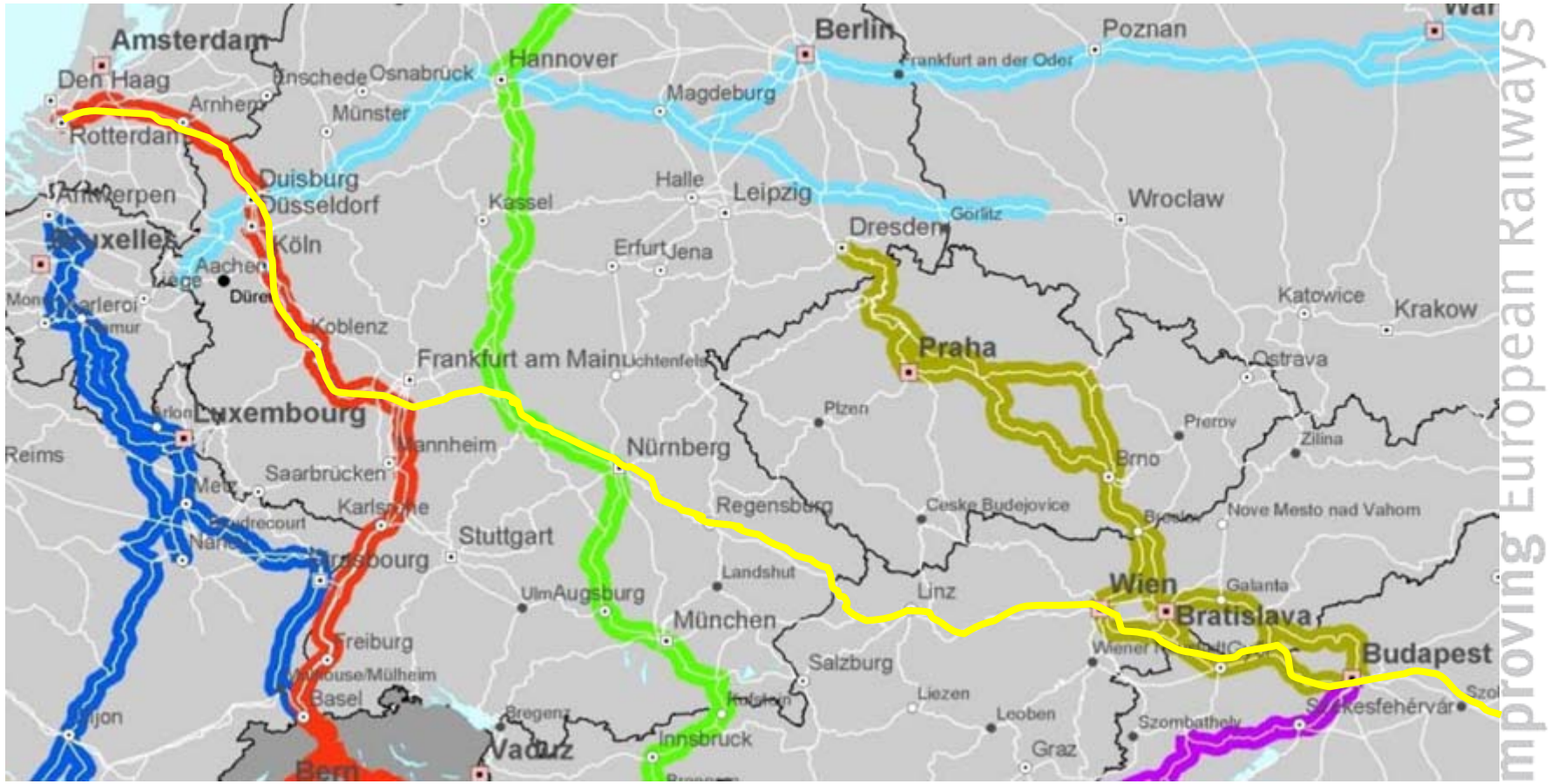


RETRACK corridor section		country	CC system
Rotterdam-Zevenaar	**Roterdam- Kijfhoek**	The Netherlands	ATB
	Kijfhoek-Zevenaar	The Netherlands	ERTMS 2
Zevenaar-Emmerich-Duisburg-Rheinstrecke-Aschaffenburg-Passau		Germany	PZB
Passau-Linz-Vienna	**Passau-Wels**	Austria	PZB (ERTMS 1 from 2008)
	Wels-Linz-Vienna	Austria	LZB (ERTMS 1 from 2008)
Vienna-Hegyeshalom		Austria	LZB + ERTMS 1
Hegyeshalom-Budapest		Hungary	ERTMS 1
Budapest-Curtici		Hungary/Romania	EVM
Curtici-Bucharest	**Curtici-Campina**	Romania	PZB
	Campina-Bucharest		PZB + ERTMS 1
Bucharest-Constanza		Romania	PZB (ERTMS 1 from 2008)

ERTMS. What is it?

- European Rail Traffic Management System
  - ETCS. European Traffic Control System;
  - GSM-R. Dedicated radio system for voice and data communication.
- **ERTMS = ETCS + GSM-R**
- There are *three* Levels.

ERTMS & RETRACK Corridors



CONCLUSION

- Study suggests that a commercially competitive freight train service is feasible on the corridor;
- Some issues to be addressed such as technology, ICT, framework conditions, cross driver certifications/ acceptance, collaboration among parties.
- Apparently no big champions on the East-West corridor;
- There are some interoperability issues to be addressed.

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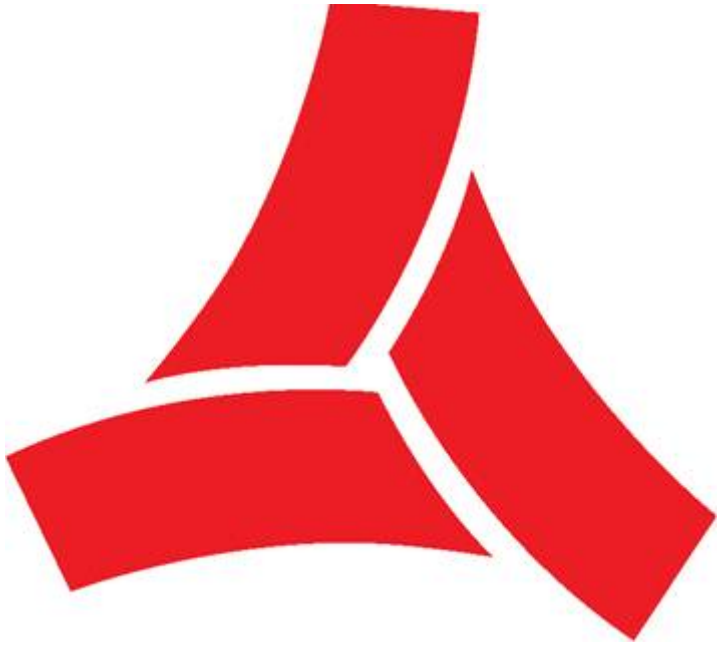
Thank you



Phil Mortimer
NewRail,
Newcastle University, UK

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