PROMIT

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Promoting Innovative Intermodal Freight Transport

Co-ordination Action

Priority 1.6.2 Sustainable Surface Transport

WP 5 / D5.2: Strategy and Recommendations

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PU	Public	**X**
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Abstract

PROMIT is the European Coordination Action (CA) for intermodal freight transport initiating, facilitating and supporting the coordination and cooperation of national and European initiatives, projects, promotion centres, technology providers, research institutes and user groups related to this complex transport mode. WP5, intermodal strategies and recommendations aims to develop a vision to stimulate the attractiveness, efficiency and quality of intermodal transport. In this context, a strategy is a long-term plan of action designed to achieve a particular goal.

Intermodality is of fundamental importance for developing competitive alternatives to road transport. As roads are being increasingly overloaded, intermodal transport can offer reliable, cost-effective delivery in an environmentally conscious manner. Developing freight transport logistics is primarily a business-related activity and a task for industry. Nevertheless, the authorities have a clear role to play in creating the appropriate framework conditions and keeping logistics on the political agenda.

Main objectives of this WP are to describe and provide a comprehensive inventory of intermodal strategies on European level and to assess market developments in terms of their strategic relevance from an industrial and policy point of view.

The outcome from the second year analysed five business cases from the strategic point of view: HUPAC, CORY, Volvo, REORIENT and INTERFACE. The HUPAC case shows how to develop co-operation between railway partners and gain competitive advantage. Every railway partner had to acquire a multi system locomotive for the network. One railway is responsible for the traction and is the only contact for this connection. CORY is an example of an intermodal solution for a city centre using inland waterways. CORY transports waste on the Thames River. The Volvo Logistics solution for transport between peripheral factories and distribution centres is rail operation, managed by Volvo and operated by Green Cargo. A back-up transport solution exists between the operations in Gothenburg and Ghent using Short Sea Shipping with Tor Line. Volvo´s case is a good showcase for efficient intermodal solutions. The benefits lie in the reliability which is better than 95% and the solution is that environmentally friendly, flexible and able to handle fluctuations in volumes. REORIENT developed business and management models for service concepts in rail corridors. The complexity of the rail business and the great differences in potential participants' initial assets and financial situation make it infeasible to quantitatively evaluate generic business models. INTERFACE showed ways to improve borders crossings terminals operations. One of the barriers in railway border crossings is the lack of functionality in electronic data interchange at terminal as well as at network level.

The second year transport policy analysis dealt with the enlargement to the East and also Europe – Asia intermodal connections. National efforts in Hungary found the basis for the BILK intermodal terminal and logistics centre in Budapest. The planning and start up of a new and first bigger intermodal terminal in a country is a demanding task. BILK is an excellent benchmark for those countries where intermodal transport is still in the development phase. The port of Gdynia in Poland is a good example of an intermodal port hub development. The unitised traffic has increased very fast. The growth and concentration in container traffic gives better possibilities to develop intermodal solutions in Poland. The intermodal transport operations are still only a marginal part of railway operations in Po-

land. In Bulgaria, the creation of intermodal terminals has only been started. There are plans for two intermodal terminals in the sea ports Varna and Burgas. The challenge for Bulgaria is the development path for successful intermodal development. RailTrace is a working consignment and wagon tracking and tracing system operated over the Internet. The concept serves customer requirements for visibility in intermodal transports covering all modes.

There are good perspectives for rail cargo in the transport to East. Some examples of the drivers are European congested ports, new terminals in the East, investor's interests eastwards and truck driver protection in EU. There is space for new concepts and new routes. There are several rail corridors between Europe and Asia: TSR, Trans China and TRACECA. Price level compared to sea route is important. Some clear advantages of rail connection are the bigger container weights compared to sea transport and faster transit time. The transit traffic has almost ended after the increase in prices. Reliability or uncertainty of the TSR service (schedules) is one of the key barriers at the moment. There must be confidence on the service. Working rail services between Europe and Asia already exist. Traffic is very unbalanced as 70% of the containers go empty from Europe to China.

Contents

1 OBJECTIVES

1.1 PROMIT

PROMIT is the European Coordination Action (CA) for intermodal freight transport initiating, facilitating and supporting the coordination and cooperation of national and European initiatives, projects, promotion centres, technology providers, research institutes and user groups related to this most complex transport form. The strategic PROMIT objective is to contribute to a faster improvement and implementation of intermodal transport technologies and procedures and to help in promoting intermodal logistics and mode shift by creating awareness of innovations, best practices and intermodal transport opportunities for potential users as well as for politicians and for the research community.

Due to the immense size of the intermodality domain PROMIT has chosen a matrix organisation, where the domain expertise is treated in five parallel clusters: (1) Organisation and Business Models, (2) Intermodal Infrastructure and Equipment, (3) Information and Communication Technologies, (4) Operation and Services and (5) Security, Safety, Legislation and Policy. The work packages ensure that PROMIT will collate, consolidate and disseminate what already exists in terms of best practises, performance indicators and benchmarks, as well as national/European strategies, policies and promotion activities. Addressing in detail the national and European promotion structures as well as strengths, gaps and weaknesses of promotion measures will be a focus of PROMIT, including the implementation of exemplary real life cases of promotion measures in areas presently not addressed.

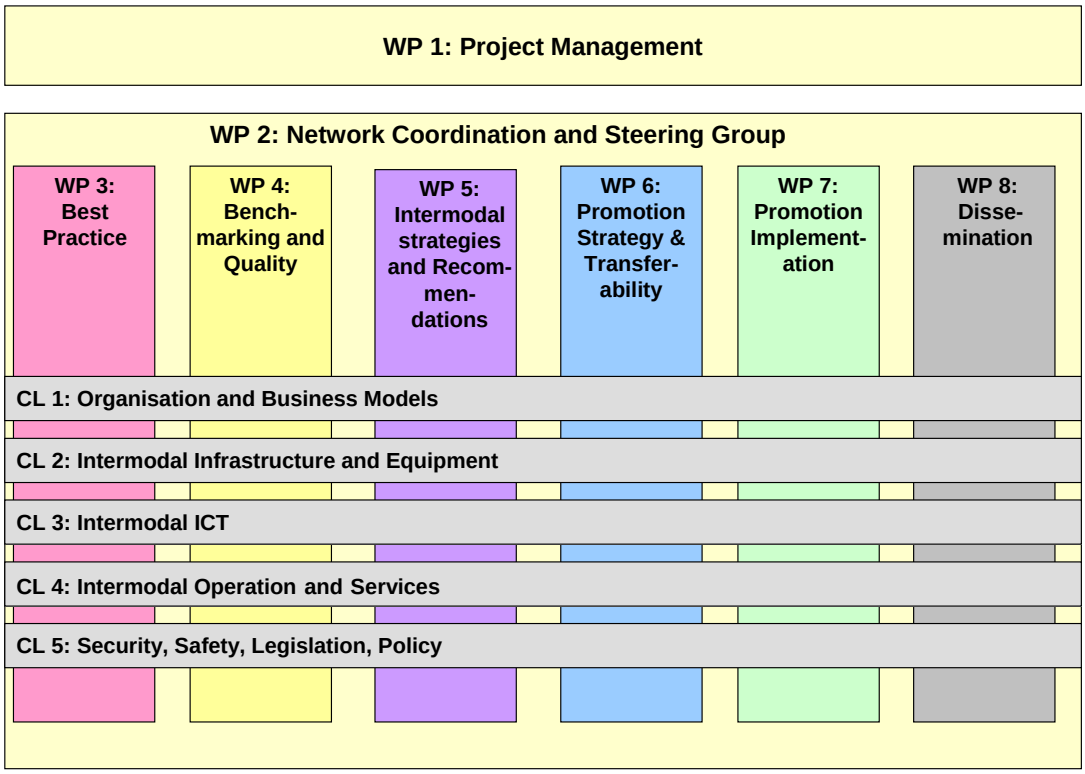


Figure 1. PROMIT project structure

PROMIT Coordination Action lasts for 3 years, during which 3 Intermodal Innovation Day Conferences and several cluster workshops will be organised in addition to the dissemination via brochures, newsletter and an Internet homepage.

PROMIT will raise synergies in the European intermodal community and contribute to policy initiatives at national and European levels supporting the shift of transports from road to intermodal transport modes.

1.2 PROMIT WP5

WP5, Intermodal Strategies and Recommendations, aims to develop a vision to stimulate the attractiveness, efficiency and quality of intermodal transport. Main objectives of this work package are to:

- Establish a framework for the collection of intermodal strategies over the different clusters
- Describe and provide a comprehensive inventory of intermodal strategies on European level
- Assess market developments on their strategic relevance from an industrial and policy point of view
- Provide recommendations on strategies and further activities

Task 5.1 contains the working instructions for clusters which were delivered on 26.4.2006 (milestone 1). In the second year these instructions were completed with a question dealing with strategies in best practice cases. Task 5.2 collates cluster input from cluster leaders in accordance with the working instructions. The collection will provide a comprehensive overview of the different strategies adopted and planned at the company, national and EU level. As experiences from previous projects showed, it is difficult to obtain wide coverage of different European countries in a seminar or a clustering meeting. Accordingly, the collection is completed by input from contractors and subcontractors. Task 5.3 includes consolidation and integration results from WP 3 and WP 4 as well as findings from the different clusters. The results are consolidated for the analysis in terms of market and policy strategies.

Task 5.4 includes recommendations. Recommendations (and guidelines) are derived for shippers, intermodal transport operators, terminal operators, logistics service providers, systems suppliers, and policy makers at European, national and regional levels. Recommendations and guidelines give advice to the relevant actors in intermodal transport to develop successful strategies and to realize the potential for modal shift. Evaluation and selection criteria were discussed in the Steering Committee meeting 28-29 June in Helsinki and are presented in the next chapter Approach.

At milestone M3, 28.2.2009, a comprehensive overview on the different strategies on intermodal transport is available and consolidated recommendations to develop successful strategies are given.

The results will be reported annually in the following deliverables:

- D 5.1 PROMIT Recommendations on strategies and further activities I - delivered May 4th 2007
- D 5.2 PROMIT Recommendations on strategies and further activities II – this report
- D 5.3 PROMIT Consolidated recommendations on strategies and further activities III 28.2.2009.

2 APPROACH

2.1 Workshop input

PROMIT is collecting information in five clusters:

1. Organisation and business models
2. Intermodal Infrastructure
3. ICT
4. Operations and Services
5. Security, Safety, Legislation, Policy

Two workshops were held in the first PROMIT year and five in the second.

The 1st Workshop took place in Basel on 13-14 November 2006 concerning “Intermodal Door-to-Door Services”, a combination of the clusters “Organisation and business models”, “Intermodal infrastructure and equipment” and “Intermodal operations and services”.

The 2nd Workshop was held in Thessaloniki on 8-9th February 2007 which addressed the following topic: “Technologies to Enhance Intermodal Transport Chains”. This workshop was a joint event of the clusters “Intermodal ICT” and “Security, Safety, Legislations, Policy”.

The 3rd PROMIT Cluster Workshop took place in Gothenburg, Sweden on June 4th and 5th, 2007. The topic for the workshop was “Intermodal Infrastructure and Equipment“, and the focus was on rail and waterborne transport. The rail and waterborne topics were mingled in the program to motivate transfer of knowledge between the representatives for the two modes. Presentations ranged from giving an overview of intermodal technologies in general, to specific technologies for efficient terminal handling, loading and unloading of vessels and trains and specific solutions for moving trailers on rail (without the use of conventional wagons). At the framework of the workshop a technical visit at the Port of Gothenburg took place. The participants had the opportunity to attend – during the first part of the visit -the unloading of a RoRo vessel operating in the North European Transport Supply System (NETSS). Loading was performed during the second part of the visit included demonstration of the use of automatic guided vehicles (developed in the EU project INTEGRATION) for efficient terminal handling and for automatic loading and unloading RoRo vessels. Due to combining rail and waterborne transport technologies in one workshop, new relationships were formed. After the workshop these new relationships have already resulted in projects combining rail, and maritime technologies.

The 4th PROMIT Workshop on Innovative co-operation models for efficient and high quality intermodal services and operation took place in Gdynia, Poland on the 25th and 26th of September 2007. The workshop addressed on successful business models related to services and operation of intermodal transport using short-sea shipping, inland waterways and rail. Themes dealt with

- Network, service, timetable, operation integration in general

- Integration between SSS and hinterland transport
- Co-operation between terminal and pre and end haulage
- Intermodal network cooperation
- Intermodal corridor cooperation
- Integration between logistics and intermodal transport chains
- Gain sharing, horizontal/vertical co-operation

The PROMIT project organized a Workshop in the framework of the Balkans Intermodal & Logistics Conference 2007, in Sofia, Bulgaria on the 9th of November 2007. This event addressed the topic "Promotion measures on intermodal transport and their impact". Members of the European Community as well as the European and in particular Balkan intermodal transport participated in the Workshop. Particular emphasis was placed on different national regulative measures to promote intermodal transport and a sustainable promotion framework for intermodal transport. Balkans Intermodal and Logistics (BIL) Conference 2007 is a regional conference, supported by the European Commission-DG TREN, and the main associations EIA, UIRR, ECSA, EFIP, ESN, AMRIE and others, as well as the national organizations – founders of the I&SPC Bulgaria. BIL 2007, the Balkans Freight Transport Forum, took place with the support and participation of the Ministry of Transport of the Republic of Bulgaria and with the cooperation of the Executive directors of the main shippers and freight transport logistics companies in the Balkans.

The 5th PROMIT Workshop "Intermodal Transport Across Borders" took place on November 20th and 21st, 2007 in Bologna, Italy. This workshop was jointly organised by Cluster 3 (Information and Communication Technologies) and Cluster 5 (Security, Safety, Legislation and Policy). A technical visit at the Bologna Freight Village took place on the second day of the workshop.

The PROMIT Seminar "Connecting Europe and Asia with Trans-Siberian Rail (TSR)" took place 14 February 2008 at VR-Group Ltd in Helsinki. Intermodal Trans-Siberian corridor is a rail link between Europe and Asia. The idea of the seminar was to promote the Trans-Siberian corridor as an alternative to the sea route. The main driver is essentially shorter lead time compared to sea alternatives. The seminar addressed on existing and new solutions along this corridor as well as other rail choices. Key stakeholders such as operators and end users participated. The seminar was divided into three sessions:

- Transport connections between Europe and Asia
- Current operations and development plans – Operator point of view
- Services in practice - Customer point of view

Dedicated material collections carried out by the PROMIT cluster working groups to screen various sources of information are used to extract relevant information. Information is extracted by means of publications, interviews, websites, personal contacts and outputs of other EU funded projects.

2.2 Strategy

A strategy is a long-term plan of action designed to achieve a particular goal, as differentiated from tactics or immediate actions taken with resources at hand. Originally confined to military matters, the term has become commonly used in many disparate fields,

such as business, marketing, technology, investment, supply chain management (of a company), intermodal network, social, and environmental strategies. A strategy is typically an idea that distinguishes a course of action by its hypothesis that a certain future position offers an advantage for acquiring some designated gain.

Strategy is based on a mission statement, vision and values. Key components are objectives, methods/core, policies and actions. Operations should then be based on these requirements. A vision is regarded as a realistic, credible, attractive future for the intermodal system while strategy means here a general direction set for the intermodal transport system and its various components to achieve a desired state in the future.

The WP5 approach includes building up an integrated intermodal vision.

2.3 Definition of target – intermodal freight transport

The EU Communication gives the following definitions that supply all or a considerable number of its logistical activities:

- 'Freight Transport Logistics' covers the planning, organisation, management, control and execution of freight transport operations in the supply chain.
- 'Co-modality' means the efficient use of transport modes operating on their own or in multimodal integration in the European transport system to reach an optimal and sustainable utilisation of resources.
- 'Multimodality' is the carriage of goods by two or more modes of transport, irrespective of the types of freight, within a single transport chain.
- 'Third-party logistics' means that an organisation uses external logistics providers

Freight intermodality is the door-to-door carriage of freight by two or more modes of transport with a high level of interoperability and integration. Intermodal logistics concentrates on the transport part of the whole supply chain (i.e. transport logistics) in favour of intermodal solutions and covers the planning, organisation, management, control and execution (implementation) of intermodal freight transport door to door.

The concepts include, in addition to transport operations where the same loading unit is moved from a point of departure to a point of destination using more than one mode without handling the goods themselves, also general cargo and dry and liquid bulk and any other commodities transported. There does not seem to be any justified reason to exclude any type of cargo, because most of it is or can be transported using more than one mode. Source: Consultation paper on logistics for promoting freight intermodality

2.4 Framework for analysis of strategies

In the PROMIT inventory we can find best practices and success stories but also several barriers or problems regarding intermodal solutions. Intermodal strategies should provide support in tackling the bottlenecks. The inventory includes:

- Best practice cases and benchmarks

- Barrier analysis which means practice/current status compared to ideal conditions, due to political, technical etc barriers
- Divided by clusters organisation and business models, intermodal infrastructure, ICT, operations and services and security, safety, legislation, policy

Viewpoints of different stakeholders in a supply chain;

- Shipper/customer/receiver of the shipment, logistics service providers(3PL, 4PL), supply chain operators and authorities
  - Objectives of different stakeholders
  - Customer supply chains – JIT, in right costs, time, service level, safety, more and more customers on environmental issues, global / local views
  - Logistics Service Provider (3PL, 4PL); fulfilment of vision, business from logistics, orchestration global / local
  - Operators – good capacity usage, quality assurance, local business from logistics
  - Investments of infrastructure managers, customs
- Support actions are today directed mainly to shippers and operators
  - To whom is the right decision?
- What is important for whom?

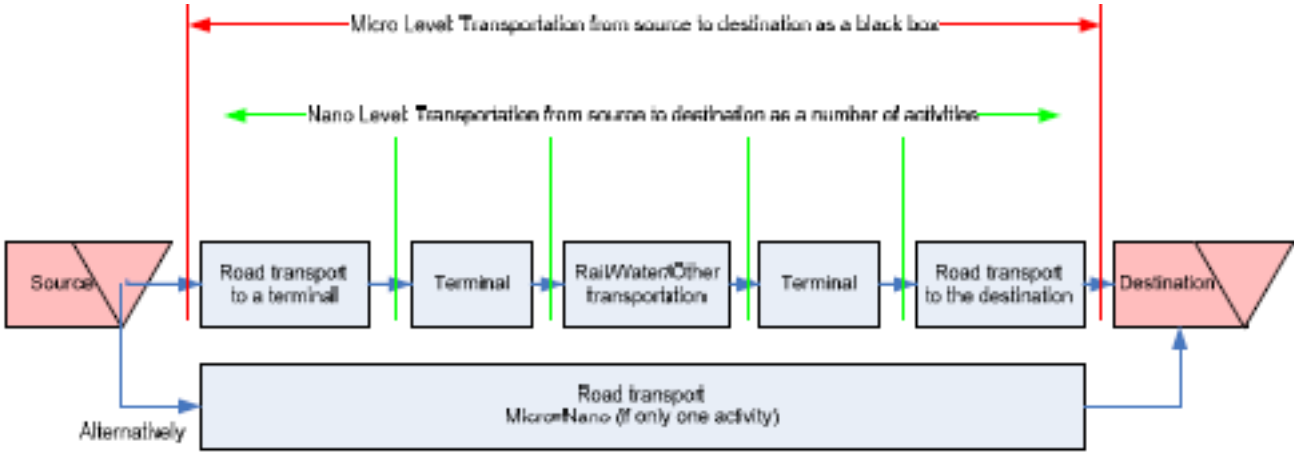


Figure 2. Intermodal transport chain levels.(PROMIT D4.1).

Energy consumption and environmental issues - "green-thinking" customers

Criteria for recommendations were discussed in the PROMIT Steering Committee meeting in June 2007. The discussion lead to the following topics:

- Open architectures, standardisation and interoperability; how to reach these goals?
- Acceptance of all EU members
- Public subsidies should treat all operators fairly
- SMEs should be included
- EU wide view of national support actions
- The role of promotion centres: One European voice

3 INTERMODAL POLICY AND VISION

3.1 EU Policy

Intermodal

Supporting intermodal transport is a major part of the Commissions White Paper: European Transport Policy for 2010 : Time to decide. It contributes to the objective of shifting the balance between modes. The aim of the Commissions policy on Intermodal Freight Transport is to support the efficient « door to door » movement of goods, using two or more modes of transport, in an integrated transport chain. Each mode of transport has its own advantages e.g. potential capacity, high levels of safety, flexibility, low energy consumption, low environmental impact. Intermodal transport allows each mode to play its role in building transport chains which overall are more efficient, cost effective and sustainable.

Road haulage is set to grow by 50% between 1998 and 2010. In line with the Conclusions of the Gothenburg Council of June 2001, one of the objectives of the White Paper is to shift the balance between the modes. The Commission's policy, through an integrated package of measure, aims to limit the increase to 38%. The White Paper proposes to achieve this first by improving the performance of the alternatives to road transport - short sea shipping, rail and inland waterway. Actions will hence focus on supporting alternatives to road transport particularly for the "long haul" section of journeys. This not only reduces congestion, but improves road safety and is good for the environment.

Intermodality is of fundamental importance for developing competitive alternatives to road transport. There have been few tangible achievements, apart from a few major ports with good rail or canal links. Action must therefore be taken to ensure fuller integration of the modes offering considerable potential transport capacity as links in an efficiently managed transport chain joining up all the individual services. The priorities must be technical harmonisation and interoperability between systems, particularly for containers. Source: White Paper.

There is a growing imbalance between modes of transport in the European Union. The increasing success of road and air transport is resulting in ever worsening congestion, while, paradoxically, failure to exploit the full potential of rail and short-sea shipping is impeding the development of real alternatives to road haulage. However saturation in certain parts of the European Union must not blind us to the fact that outlying areas have inadequate access to central markets. This persisting situation is leading to an uneven distribution of traffic, generating increasing congestion, particularly on the main trans-European corridors and in towns and cities. To solve this problem, two priority objectives need to be attained by 2010: — regulated competition between modes; a link-up of modes for successful intermodality. Source: White Paper

Logistics

Logistics is the planning, organisation, management, execution and control of freight transport operations. It integrates individual transport acts to door-to-door supply chains, determining the efficiency of freight transport.

Logistics has also become an industry in its own right, enjoying sustained growth over the past years. Several of the leading companies world-wide are European. With ever increasing volumes in freight transport, logistics needs to find solutions to the emerging consequences of this growth. In economic terms, these relate to the costs incurred through congestion, labour shortages and to the dependency on fossil fuels. Regarding the environmental and social dimensions the challenge lies in reducing freight transport's negative impacts on the natural and social habitats. Logistics service providers need to help develop solutions to these issues.

Developing freight transport logistics is primarily a business-related activity and a task for industry. Nevertheless, the authorities have a clear role to play in creating the appropriate framework conditions and keeping logistics on the political agenda. This framework approach concentrates on improving the preconditions that Europe can offer for logistics innovation and leaves the internal running of company logistics to the companies themselves. Source: Communication – Freight Transport Logistics in Europe.

In 2006, the European Commission reformulated its policy on freight transport logistics, taking up the issues highlighted above and describing how to take forward work to address these. The Communication is being followed up through a Logistics Action Plan that was adopted in October 2007, as part of a package of measures. It suggests a range of concrete actions in priority areas such as electronic information on freight, training and quality indicators, simplification of processes, vehicle sizes and loading units, urban transport and long-distance corridors. The Action Plan will determine the Commission's work on logistics over the medium term.

One of the most important areas is the ICT for intermodal transport. E-freight ICT and ITS aims at Internet solutions, robust data architecture primarily for business-to-administration and administration-to-administration data flows, standardisation of electronic description of services offered by freight transport operators and a standard for in-vehicle telematics platform (the On-Board Unit) that facilitates different services on the truck. Other areas of action plan are:

- Sustainable quality and efficiency
- Simplification of transport chains, e.g. a single European transport document that can be used by all operators for all modes
- Green freight transport corridors, including terminals
- Urban freight logistics
- Vehicle dimensions and loading standards

3.2 PROMIT vision

PROMIT WP5, intermodal strategies and recommendations aims to develop a vision to stimulate the attractiveness, efficiency and quality of intermodal transport. In this context, a strategy is a long term plan of action designed to achieve a particular goal. A vision is regarded as a realistic, credible, attractive future for the intermodal transport.

Intermodal transport (road/rail, road/waterway, rail/waterway of trimodal combination) is natural part of the European transport system realising the idea of co-modality. In ten years the intermodal volumes will **double**, compared to the year 2007.

- Why yes – Existing drivers such as lead-time on long distances, reliability, cost efficiency (80 trucks vs one train), sustainability, especially CO2 efficiency by energy efficiency, good quality, transport policy.
- Why not – Existing barriers such as lead-time, costs, inflexibility, rigidity, unreliability, poor quality, transport policy.

3.3 Importance of ICT in Intermodal transport and transport policy

There are significant barriers in intermodal transports that can be solved by ICT:

- Extensive discontinuities in the transport chain and discrepancies between modes.
- Business, organisational and legal barriers imposed by the wide variety of freight transport actors and public authorities.

The evolution in ICT is continuous and the solutions ICT provides to the intermodal transport freight community are constantly improving. However, there is still a great deal of work to be done and significant problems and obstacles to be confronted.

The major problems in intermodal transport stem from the series of difficulties arising from the need for interaction with many actors and the differences in the way each actor operates. These problems are:

- Different level of IT penetration: different stakeholders have adopted IT at different scales.
- Low compatibility of systems developed
- Different standards
- Lack of data transmission interoperability
- Lack of systems integration

A main challenge for the ICT sector in the intermodal transport is the implementation of open architectures in order to facilitate the interconnectivity between various applications and to enable the integration with future applications or modules developed. The lack of standards is another problem to which ICT has to provide a more concrete solution. Therefore, there is need for interfaces that would interpret information given in different formats in a common, standardised way.

4 MARKET STRATEGIES ANALYSIS

Market strategies are analysed both from shipper as well as from service provider point of view and will focus on innovative concepts and best practices based on experiences and new developments:

- Business models (integrators)
- Logistics processes and supply chain management
- Information and communication management aspects (architecture viewpoint)
- Public private partnership and economic viability (ROI)
- Quality of services (especially railway problems as stated by UIRR and network aspects)
- New information and communication technology solutions (ICT), based on experiences of existing systems such as CESAR, RIS and the expected IP project (of Call 3A)
- Different branches e.g. automotive, electronics, wholesale and retail
- Developing transport logistics and intermodal solutions are primarily business-related activities and, thereby, a task for industry, as stated in the Communication.

In an environment characterized by global supply chains, heightened uncertainty, increasing product complexity and ever-increasing customer demands for higher service at lower costs, how do leading companies continue to drive superior costs, service and quality performance through their supply chains? The ELA / AT Kearney study 2004 demonstrates the effects of increasing complexity of supply chains:

- Larger share of purchases and sales outside Western Europe leading to longer and more complex supply chains that are less failure tolerant
- Ever increasing customer requirements regarding service levels, especially with respect to lead times and delivery reliability
- Increasing amount of value added service, shifting activities that traditionally belong to manufacturing into the distribution centres
- Higher product complexity, manifested in shorter product life cycles and arising number of stock keeping units

Key areas of supply chain development are collaboration - sharing and utilization information along the entire supply chain, value chain management (organization of the entire supply chain by integrating partners according to their qualifications and capacities in such a way that total supply chain performance reaches its optimum) and finally differentiation of supply chains, recognising that “one size does not fit all”.

4.1 Case studies

The second year input contained 25 best practice case studies (***table 1***)

Table 1. Promit Cluster input, year 2.

Nb.	Project inventory	Short description	Clusters covered	Modes used	Status	Strategies
1	Cory Environmental	A UK company transporting domestic and commercial waste on the River Thames. They have 7 tugs pulling 47 barges and the annual volume is 650,000 tonnes of waste per year. The company has invested in a number of areas to improve their services.	1	River (Thames)/Road	In operation	The future of transporting waste on the River Thames appears to be secure, because it is sustainable and efficient method for moving waste across London. It also reduces waste collection vehicle mileage by road substantially.
2	SINGER project - Slovenian Intermodal Gateway to European Rail	The SINGER project is a modal shift action to transfer traffic from road to rail. The main goal is to create an international network of fast and reliable unaccompanied services with Slovenia as gateway country between West and Central/Eastern European countries.	1	Rail/Road	In operation for the second year	This business model is transferable to other relevant European transport actors.
3	The cooperation between Salerno Container Terminal (SCT) and Nola Interporto showing the potentiality of a very efficient case of logistic system in Italy.	The main objectives of the project is to grant a central role of railway service for transport in Campania, to increase modal shift in the use of rail transport and to contribute new logistic system in Campania region.	1	Rail/Road/Maritime	The service in operation since September 2007.	
4	Coca-Cola Drikker AS	Coca-Cola Drikker AS is responsible for sale, production and distribution of Coca-Cola in Norway. It is the largest supplier of non-alcoholic beverages in Norway. The main objectives of this case are to describe how Coca-Cola company serves the warehouse in Tromso that supplies the northern par of Norway with products from its main production plant in Oslo.	1	Rail/Road/Maritime	The services are fully implemented and in operation	
5	BILK Combiterminal	BILK terminal is the main intermodal centre of Budapest. The objective is to develop the terminal in two phases so the capacity of the terminal can be increased. A lot of innovative, electric solutions has been used in the development process.	1	Road/Rail	The first development phase has been in operation since 2003 and the second one will be soon accomplished	
6	Rhinecontainer BV	The company operates between the seaports of the Benelux and the terminals along Rhine, Main and Neckar. It offers a fast and regular intermodal alternative to and from the Hinterland by means of some 25 barges. The business strategy is to compete on reliability of services/system, not on speed.	1	Inland waterways	In operation	Rhinecontainer is a pioneer in initiating strategic change in the sector. This case study shows the necessity of partnerships and the need for a change in culture, as those are critical success factors for the future performance of the inland waterway transport in terms of market share.

Nb.	Project inventory	Short description	Clusters covered	Modes used	Status	Strategies
7	Port Feeder Barge	The Port Feeder Barge is a very manoeuvrable self-propelled both-direction pontoon equipped with an own crane for container handling by itself. It helps to ease container port operation by making container transport and transshipment inside the port more economical and cost efficiency, taking over container haulage within the port and reducing feeder vessel shifting.	1	Rail/Road/SSS/Inland waterways	The service has been planned since 2003/2004, but the beginning is still unknown	Transport problems can be solved between different terminals within a port. The waiting time for inland vessels can be reduced for better inland navigation services. Addressed to ports with problems in hinterland transport and haulage of containers within the port.
8	CroBIT - Cross Border Information Technology	CroBIT is a new system that gives the railways a tool to track consignments and calculate ETAs for their traffic throughout Europe. The objective is to develop, test and evaluate many kind of solutions for improving service reliability and new technical systems.	3, 4	Rail	The project ended in year 2005	Service reliability is now surpassing pricing as the most important customer criteria for choosing a particular mode of transport. The CroBIT system provides railways a toolset to achieve better visibility, enhanced service reliability and customer service.
9	MOCONT/MOCONT II - Monitoring the yard in CONtainer Terminals	The project deals with telematics application to intermodal transport, with particular care to the management of container terminals. MOCONT aims at providing terminal operators with precise knowledge of the container positioning in the yard. MOCONT II aims at the assessment of the MOCONT concept.	3, 2	Rail/Road/Maritime	In operation	The MOCONT concept represents a good example of an ICT implementation that can readily improve the productivity of a terminal.
10	CESAR I&II / CESAR INFORMATION SERVICE - Co-operative European system for advanced information redistribution	The objectives of the projects are to make intermodal transport in Europe more attractive by reducing the technical barriers, performing a harmonisation of information exchange both between combined transport operators and between operators and customers.	3, 1, 4, 5	Rail/Road	The CESAR platform has been implemented and is in operation	CESAR represents a clear success story concerning the possibility of an EU-sponsored redearch project to originate a new business and have a permanent impact on a specific market.
11	SESTANTE - Strumenti Telematici per la Sicurezza a l'Efficienza Documentale della Catena Logistica di Porti e Interporti	SESTANTE wants to operate at the level of data and services sharing between local communities, which need to be integrated with other national and international communities. One of the main objective is to increase the whole interoperability and intermodality of the freight logistic chain.	3, 4	RO-RO/Maritime	The project is fully implemented and the applications have been used for a pilot period	The project succeeded in laying down a communication chain between the single user components and the principal centres of the intermodal chain which simplified particularly the operative interactions and the document exchange processes amongst the institutional bodies and the operators of the whole logistic chain.
12	RailTrace	RailTrace is a consignment, wagon and open messaging tracking and tracing system over the Internet. Its objectives are on-line exception reporting, to increase railway's competitiveness against other modes of transport and more reliable East-West rail transportation.	3, 4	Rail/Road/Maritime	In operation since December 2000	The concept serves customer requirements for visibility in intermodal transports covering all modes and integrating both consignment and wagon information. RailTrace enables control of wagon and consignment movements, based on existing messages. No extra manual input or technical devises are not needed.

Nb.	Project inventory	Short description	Clusters covered	Modes used	Status	Strategies
13	POL-CORRIDOR	One of the important parts of the Pol-Corridor project was to outline the IT service architecture in order to design guidelines for implementation of information systems, the rules for information exchange between the Pol-Corridor stake-holders, and the management of functional inter-faces. An important task was to determine how currently available IT systems could serve this intermodal transport corridor.	3, 1, 4	Rail/Road/Maritime	POL-CORRIDOR and follow-up re-search Reorient have been com-pleted. The imple-mentation process continues.	This project learned that US intermodal experiences are extremely important and that infrastructure issues must be solved. Long term paths are important. These ex-periences can be used in other intermodal corridor projects.
14	INTEGRATED TMS - APS	The integrated TMS-APS software determines the most cost-efficient load and route for a con-tainer or trailer across various modes. The inte-grated system takes into account capacity of equipment, departure times of trains and ferries, location of equipment, nearest cleaning station, etc.	3, 4	Rail/Road/Maritime	The project is still in motion	Potentially TMS-APS integration can lead to many benefits, such as cost reduction, profit optimization, customer service etc. However, it is still too early to draw conlu-sions already.
15	SPIN (Southamton Port Information Network) / VBS (vehicle booking system)	The main aim of SPIN is to provide an efficient electronic, e-port, facility to create a streamlined system and a paperless environment. It is claimed to be one of the most advanced port networks in the world. VBS smooth the supply chain and produce a more even workload throughout the day. It also aims to reduce the misuse of bookings and to maximise resources.	3, 4, 5	Rail/Road/Maritime	In operation	SPIN is a well-established network of the various actors involved in the port's activi-ties. It is designed to allow paperless communication and transactions and is now viewed as a vital part of the port's day-to-dat functioning.
	M-TRADE	The main goal is to explore and promote GNSS (EGNOS /Galileo) use in Freight Multimodal Transport.	3	Rail/Road/SSS/ Maritime	Demonstration	
	INTERFACE	The project scientific research objective is to improve the interoperability of the transport net-works at terminals at the border crossings (inside EU and between EU and CEECs) in order to overcome the technical and operational barriers.	3, 4	Rail/Road	In operation	Functionality of EDI at teminal and network level, tmetable rliability, effctiveness of tchnical and cmmercial ispections and providing customer oriented innovative services
	PORT INFOLINK	Optimization of the processes in the trans-port chains that run through the port of Rot-terdam by means of on-line information and communication services to boost the effi-ciency levels of customers. This leads to cost reductions, quality improvement and user-friendliness.	3	Rail/Road/SSS/ Maritime	In operation	As long as no true EDI or XML-standards exists which could facilitate the exchange of information, a Port Community System like Port infolink helps to overcome the problems re-lated to the exchange of information between these partners

Nb.	Project inventory	Short description	Clusters covered	Modes used	Status	Strategies
16	HUPAC - Shuttle network with international integrated traction on transalpine corridors	The HUPAC group is a European wide intermodal operator. Its target is growing in the market with consequent extension of the network and optimizing intermodal operation.	4, 1, 3	Rail/Road	In operation	The main innovation of the approach are integrated traction on cross border intermodal operation and services, consequent shuttle system and consequent long term strategy of HUPAC to increase intermodal transport.
17	NARCON - National Rail Container Network in Belgium	The main target of NARCON was to provide a competitive, efficient and high quality intermodal service as an option to the road transport by building up an integrated intermodal transport network and optimizing operational aspects. NARCON allows each transport modality to play its own specific role.	4, 1	Rail/Road/SSS	In operation	
18	TransRussiaExpress	The specific targets of TransRussiaExpress were providing a fast and reliable connection from Germany to Russia for intermodal SSS transport and safety for carrying valuable goods.	4, 1	SSS	In operation	The early positioning in a developing transport market will enable a strong position in the competition transport market. Using of existing infrastructure and good hinterland connections are essential for all SSS operators.
19	ITA-BEL Express	The project address the flows South-North and North-South from Italy to UK. The main target is the shift from road to rail indesit freight transport directed to the UK.	4, 1, 2	Rail/Road/SSS	In operation	The main innovation of the approach is the direct involvement of a productive company. It is possible to build up an international D2D services collaborating directly with the industry in order to understand their needs.
20	Shunting Improvement at Interporto Bologna	The project targets are to increase the efficiency of the shunting process, to optimize the information flow between different actors involved in intermodal transport, to develop core IT services following an international approach and try to convey results of implementation of new IT services to actors/partners.	4, 3	Rail	The approach is implemented partially. The final relaese is foreseen by the end of 2008.	One very interesting aspect of this project is the very positive experience that a terminal operator had with the implementation to ICT solutions. Such success stories can be used to show-case the ptential benefits of ICT and help in the wider adoption of such solutions.
21	Volvo logistics cooperation using intermodal transport	When starting the activities, Volvo had premium transport and the logistics solutions were sustainable. However, the cost was not optimal and the environmental impact could be reduced. Therefore this new solution needed to be more cost effective, reliable and sustainable and also increase capacity as well as provide a potential for further development.	4	Rail/SSS	In operation	

Nb.	Project inventory	Short description	Clusters covered	Modes used	Status	Strategies
22	RODER & UN Ro-Ro Group of Companies	The project carried out in a pure intermodal environment and it also encompasses various logistical techniques and tools which makes it unique on its own. It is a package deal where goods are transported from one end to the other, making use of different transport modalities without the need for handling of the goods themselves.	4	SSS	In operation	

For the second year, the following best practice case studies were selected for strategies analysis:

- HUPAC
- CORY
- VOLVO
- REORIENT
- INTERFACE.

4.1.1 HUPAC

The HUPAC group is a European wide intermodal operator. Its target is growing in the market with consequent extension of the network and optimizing intermodal operation. The adjustment from national to international integrated traction is tantamount to a revolution on the European rail landscape. Every railway partner had to acquire a multi system locomotive for the different electrical networks used in different countries. The current change of locomotives at the borders had become unnecessary which has meant that the productivity of the traction has been improved. One railway is responsible for the traction and is the only contact for this connection. Train, waybill and customs data currently sent to up to five different railway and customs offices can be co-ordinated in future via one interface. This saves money and time for everyone concerned.

The geographical focus is on the transalpine corridor through Switzerland. The current network of HUPAC with international integrated traction is oriented to north south corridor through following countries and areas: Italy, Switzerland, Netherlands, Belgium, Scandinavia, Poland and Austria.

The Hupac Group is a European wide intermodal operator with a turnover of almost 300 million EUR. The company operates a shuttle net (share 95% of the traffic) and a rolling motorway service (5%).

Intermodal transport faces quality and efficiency problems, especially also when the border crossings are part of the intermodal chain. This was the case before 2005 also on transalpine corridors. On border crossings usually staff and equipment (traction) had to be changed due to national regulations and procedures. This was cost and time consuming and the split of responsibilities between the national railways had a negative impact on the efficiency and quality of the intermodal transport chain.

The railway market liberalization in Europe and especially in countries on the north-south corridor lead to new opportunities to organise and operate the railway main haul. On the transalpine corridor is a strong competition between 5 major railway undertakings.

Targets

The target of the HUPAC Group is growing in the market with a consequent extension of the network and optimizing intermodal operation. This aims at:

- Direct Shuttle train connections with the most important European ports, consumer and production areas
- One Stop Shopping for the customers due to efficient logistical solutions

- Tracking and tracing services
- Punctuality over 90%, at the moment 70% of the trains are on time.
- Operation without subvention of the government for the use of the railway lines

Users and stakeholders

The main stakeholders are intermodal service operators, railway undertakings and logistics service providers. HUPAC is owned by private transport companies (72%) and railway undertakings (28%). Actually there are 98 shareholders. Railway partners are Railion (Germany), Rail4Chem (Germany), SBB Cargo (Switzerland), Ferrovie Nord Cargo (Italy), and Trenitalia Cargo (Italy). The users are all service providers and logistic operators.

HUPAC Shuttle Network

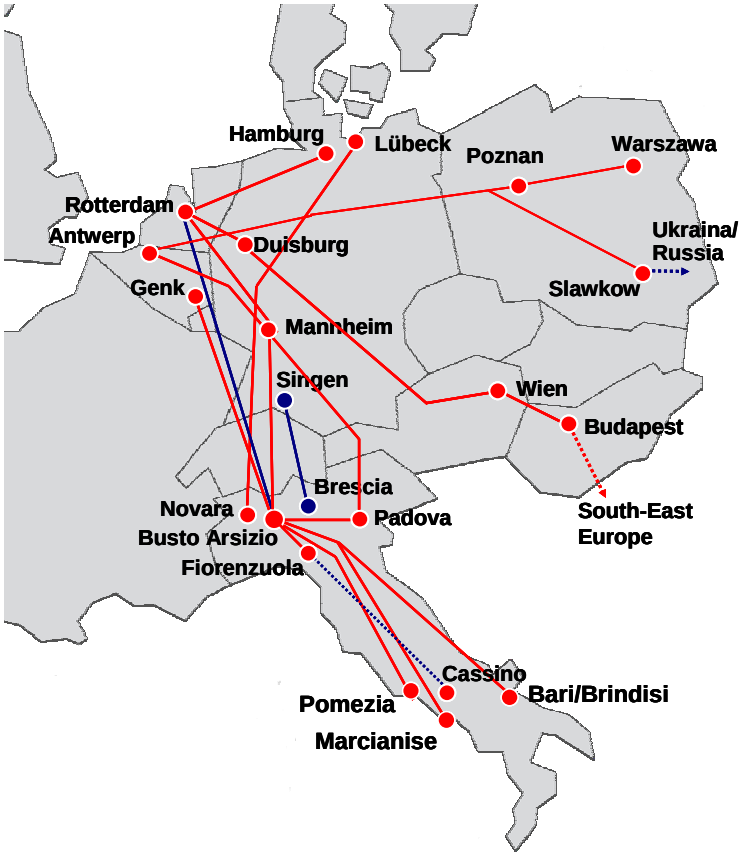
HUPAC built up a European intermodal shuttle network (***Fig. 3***). HUPAC provides three services in combined transport:

1. Continental services: Terminal-to-terminal transport connections between Europe's major economic areas.
2. Maritime inland services: Inland transport from/to ports in the Mediterranean and in the North Sea with additional delivery services (also called maritime land bridge).
3. Accompanied combined transport: HUPAC also offers a Rolling Highway service for fast transalpine connections.

In 2006 HUPAC traffic was more than 100 trains per day, which is equal to about a 612000 road consignment and a volume of 10.8 million net tons.

Figure 3. HUPAC European intermodal shuttle network

The network development started with north south connections on the transalpine corridor through Switzerland and is expanding to include more and more also East-West connections. ***Figure 4*** shows the network extensions in 2006.



		Couples of trains per week
Apr. '06	Genk ⇆ Busto Arsizio	5
Apr. '06	Rotterdam ⇆ Mannheim	6
Apr. '06	Antwerp ⇆ Padova	3
Jun. '06	Busto Arsizio ⇆ Fiorenzuola + GTW Cassino	5
Jul. '06	Duisburg ⇆ Wien/Budapest + GTW Rotterdam	4
Sept. '06	Lübeck ⇆ Novara 4m	3
Sept. '06	Rotterdam ⇆ Hamburg	5
2007	Singen ⇆ Brescia	
	Rotterdam ⇆ south/east Italy (via Busto Arsizio)	

Figure 4. Network extensions in 2006

2005 was the first year with international integrated traction for over 15000 HUPAC trains (***Fig. 5***). Integrated traction means that there is only one operator and one interface between HUPAC and the operator. The rate of punctuality, i.e. the number of trains with less than one hour's delay has been improved. Every traffic relation of the HUPAC Shuttle Net and Rolling Highway services has been entrusted to a single railway company, from origin to destination. For each relation, HUPAC has selected the most advantageous railway company, both in terms of costs and of overall service quality.

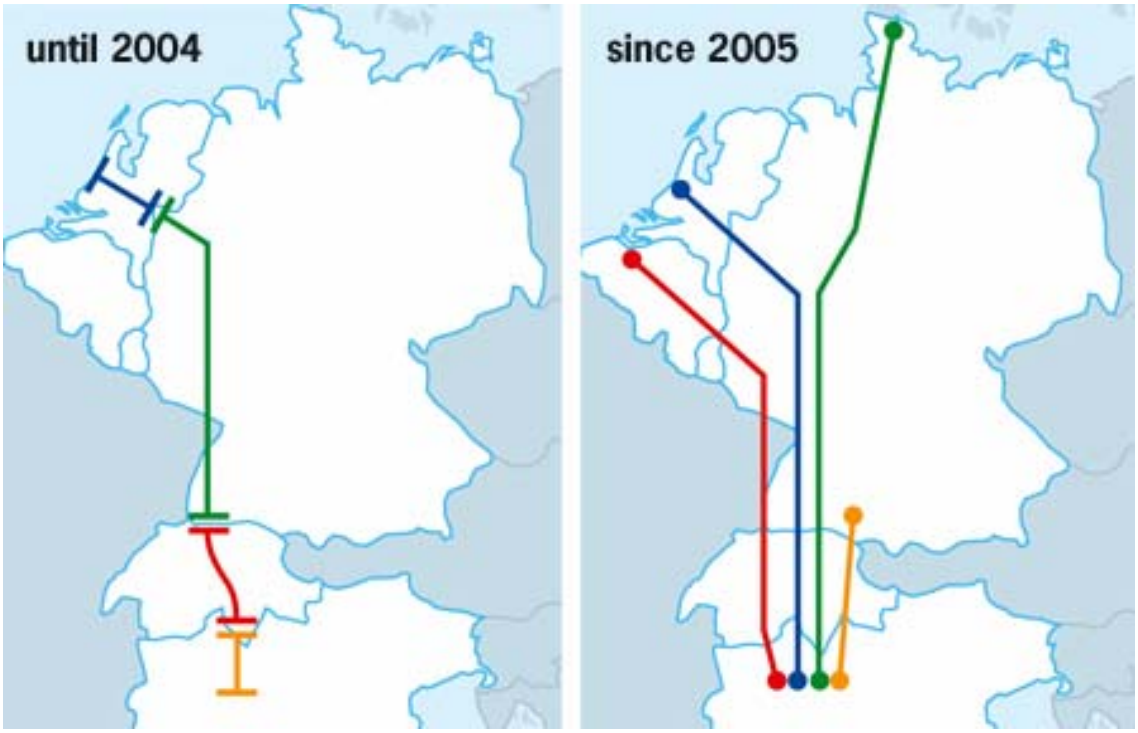


Figure 5. Integrated traction.

There are operational advantages of a single railway company for the entire journey. Quality contracts can be set up in co-operation with the customers. The railway assumes overall responsibility for its performance parameters.

HUPAC uses mostly its own terminals. Today there are 10 terminals (***Fig. 6***). At these terminals HUPAC can handle all types of containers

Figure 6. Hupac terminals

HUPAC´s own fleet comprises 4425 railway wagons, 7 main line locomotives and 6 shunting locomotives. HUPAC invests in own resources mainly to be independent.

IT-Applications

In terms of IT-applications HUPAC uses the system e-train (also e-Goal) (***Fig. 7***). HUPAC introduced its GPS based system e-train in 2006. Trains are equipped with a GPS sensor. So the positions of all trains are known. This data goes into a software platform called GOAL (Global Application for Logistics). Goal is also connected to CESAR.

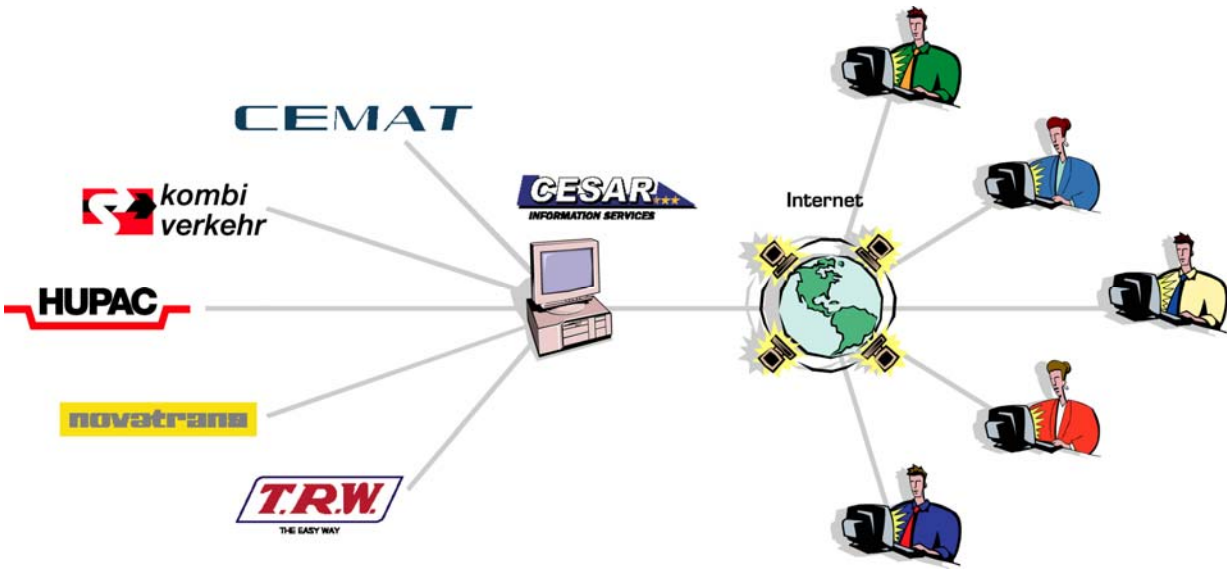


Figure 7. E-train system (also e-Goal)

Benefits

For the whole intermodal transport services the turnover in 2006 was 303.2 Million EUR and the cash flow was 37.3 million EUR. With the integrated traction HUPAC promotes competition between the railway operators. The railway operators themselves provides client orientated services. The benefits of a single railway company on a shuttle connection are:

- Utmost simplification of transport procedures
- The reduction and possibly the removal of interface points
- Improvement of overall system performance
- Clear increase in quality and productivity
- Fast reaction in case of irregularities.

Furthermore, having a single partner to interact with means that information regarding each journey is managed more efficiently, the flow of communication towards customers is considerably speeded up, and as a result the overall quality of service is optimised. With the integrated traction HUPAC takes part in the modal shift which is a high prioritised political goal of the Swiss government. An environment-friendly transport solution is the consequence of that. The intermodal volume development of HUPAC is very positive (***Fig. 8***).

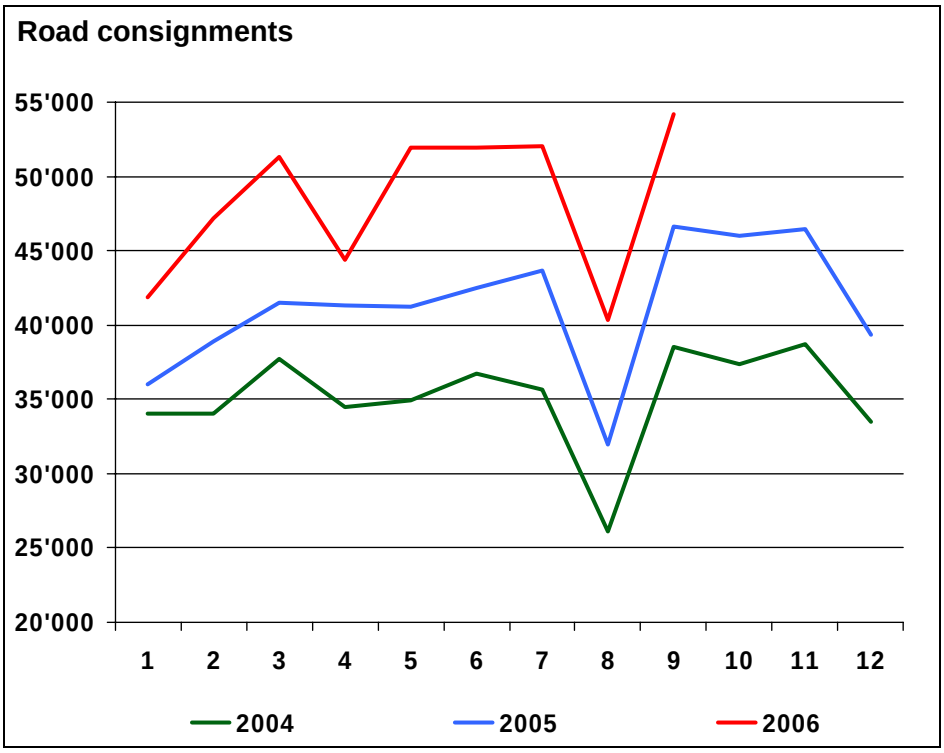


Figure 8. The intermodal volume development

Barriers and problems

- Every terminal at the final destination is operated by a different company
- The last mile to the terminal is in relation to the rest of the transport very expensive and reliable access is problematic.
- Especially the smaller partners of HUPAC lose a part of their flexibility. They have problems to provide special trains (one day solution).
- The harmonisation procedures are today too costly and include high entry barriers. In every country the technical infrastructure is still different. More new wagons in Europe should be permitted on the European network and the security systems of the locos should be standardised.
- Freight and passenger trains on the track are not equally treated. The priority for passenger transport affects the efficiency and reliability of freight trains.
- Ril infrastructure for combined transport still needs subvention from the governments for a price reduction. The consequence is a high dependency on the government and its cost saving programs.
- Shortage of terminal capacities and also railway track capacities until the opening of the Alpine Tunnels.
- The implementation of the separation between infrastructure management and transport operation is not yet sufficient.

The main innovations of the approach are:

- Integrated traction on cross border intermodal operation and services.
- Consequent shuttle system

- a fixed composition of wagons, travelling between two terminals
- no shunting
- connection between the main European economic centres and ports
- different departures per day and per direction
- high degree of reliability and punctuality
- bundling of traffic in hubs (gateway)
- high degree of reliability and punctuality
- implementation of “just in time” concepts
- aim: transport at least as fast and economical as road traffic

4.1.2 CORY

CORY is a UK company transporting domestic and commercial waste on the Thames River. They have 7 tugs pulling 47 barges and the annual volume is 650,000 tonnes of waste per year. The company has invested in a number of areas to improve their services. The future of transporting waste on the Thames River appears to be secure, because it is a sustainable and efficient method for moving waste across London. It is estimated that transporting this waste by river removes 100,000 heavy goods vehicle movements a year from London’s highly congested roads, equivalent to 400 trips per day.

Cory Environmental transports domestic and commercial waste on the Thames River, using tugs, barges and containers (see picture 9), to the company’s landfill site at Mucking, Essex. An annual volume of 650,000 tonnes of waste is transported in this way. Their main ’customer’ for this service is the Western Riverside Waste Authority (WRWA), an autonomous statutory local government body responsible for waste disposal on behalf of four London boroughs (Hammersmith & Fulham, Lambeth, Wandsworth and Kensington & Chelsea). Each of these boroughs lie next to the River Thames and are responsible for collecting domestic waste from households and delivering it, by road, to two riverside transfer stations which are owned by the WRWA. Some commercial waste is also collected by the boroughs and taken to the transfer stations for disposal by Cory.

Cory Environmental, providing the river transport and landfill site at Mucking, is a privately-owned company. Western Riverside Waste Authority (WRWA), responsible for the waste disposal and providing transfer stations, crane and wharf facilities. Four London boroughs are responsible for the waste collection from households and some commercial premises.

Cory has been carrying waste on the Thames River for over 100 years and working with the WRWA for over 20 years. The Cory fleet currently comprises seven tugs pulling a total of 47 barges containing containerized waste. Each barge ***(fig. 9***) is capable of carrying at least 300 tonnes of waste on each journey. There are 900 containers available for use. The transfer stations (at Smugglers Way, Wandsworth and at Cringle Dock, Battersea) are equipped with dockside lifting equipment to lift containers to and from barges. There is a new Materials Recovery Facility (MRF) at Smugglers Way, Wandsworth, with a capacity to sort 84,000 tonnes of recyclable waste every year, one of the largest such facilities for a local authority in the UK.

Figure 9. One barge on the river Thames

Benefits

London's streets are highly congested so using the centrally located Thames River is an attractive option in terms of reducing both direct and external transport costs. Some of London's waste collection and waste disposal authorities have been particularly keen to use the Thames River to transport waste. Cory Environmental have provided invaluable support with their vast amount of experience in waste management.

Cory Environmental have been providing waste transport and disposal services for WRWA since 1986 and in 2002 they were awarded a 30-year contract with WRWA.

Barriers and problems

The movement of waste by river is heavily reliant on there being access to waste disposal or treatment facilities. When new facilities are being planned, the possibilities for transport by water may not always be adequately considered. Landfill sites in the UK, and particularly in the south of England are rapidly becoming full so alternative facilities are needed.

In the context here, Cory Environmental had planned for their landfill site at Mucking to close on 31 December 2007 and, from 2008, waste would be taken to a new energy from waste (EfW) plant at Belvedere, Bexley; however, the opening of the EfW plant was set back by planning permission delays (it took 6½ years to gain permission) and is now due to begin operating in 2010. Cory had to apply for an extension for their landfill site at Mucking to remain open until 2010, working at reduced intensity levels.

Had this permission been refused there was a danger that Cory would have to disband their specialist lighterage workforce and that, once lost, they would be extremely difficult to re-establish.

Strengths and weaknesses

The main strengths of this co-operation between Cory Environmental and the WRWA are:

- Simplicity - the approach taken and equipment used are low-tech. The use of containers promotes intermodality, as they can be readily carried by both road vehicles and barges.
- Experience - Cory Environmental have a long history (over 100 years) of transporting waste by water and their lighterage staff, in particular, are highly experienced.
- The proactive approach taken by the waste collection and waste disposal authorities in encouraging the movement of waste and recyclable materials by water.

No specific weaknesses have been identified, although it is noted that it relies on the availability of riverside resources (e.g. waste disposal sites). Transporting waste on the Thames River is a long-established activity and its future appears to be secure, as it is a highly sustainable and efficient method for moving waste across London.

Critical Success factors

Protection of the existing riverside facilities is critical to the success. London has a list of safeguarded wharves whereby local authorities are expected, through their planning systems, to protect against redevelopment and to promote freight transport by river. The strategic sustainability benefits of using the river for freight transport have been set out in a guide called The London Plan: Spatial Development Strategy for Greater London. Development of new riverside waste disposal or treatment facilities is also critical to the success (see Future development section for examples).

4.1.3 VOLVO

One of the objectives of Volvo Logistics is to provide premium transport and sustainable logistics solutions at an optimal cost and a minimum of environmental impact. The new solution aimed at being more cost effective, reliable and sustainable and also increasing capacity as well as providing a potential for further development. The benefits of the transport solution are reliability with precision better than 95%, environmentally friendly solution compared to road transport and flexibility and ability to handle fluctuations in volumes.

Recognising the fact that Volvo’s factories are “peripheral” in relation to customers, the company perceives a distance handicap compared to the competition. In peripheral regions there are few transport alternatives to choose from and these have typically low frequencies. On the other hand, transport efficiency is decisive to compensate for the distance handicap of the Volvo factories. In practice these factories have to pay transport costs twice, both for sourcing of material and for the finished products.

When starting the activities, Volvo had premium transport available (for that time) and the logistics solutions were sustainable. However, the cost was not optimal and the environmental impact could be reduced. Volvo logistics cooperation covers the corridor between Sweden and Belgium and it includes the transport modes of rail and short sea shipping.

One of the Volvo Logistics objectives is to provide premium transport and sustainable logistics solutions at an optimal cost and a minimum of environmental impact.

The new solution needed to be:

- At least as fast as the existing system
- More cost effective
- Reliable
- Increasing capacity
- Sustainable
- Combining products(cabs) with production material
- Providing a potential for further development

Users and stakeholders

The initiative to develop the new logistics solution came from within Volvo and the task was given to Volvo Logistics (VL). In addition to serving Volvo, VL also has a number of external customers like Volvo Cars, GM, Nissan, Land Rover, Renault, Ford, Jaguar, Aston Martin, and Boeing. In addition they serve “Global Suppliers” to the automotive industry.

As seen in ***figure 10***, the Volvo factories and distribution centres in Umeå. Gothenburg, Olofström/Almhult, and Ghent are involved in the logistics solution. The companies involved in the “8” rail operations are Green Cargo, who is the one point of contact for Volvo Logistics. The other rail operators are Railion Denmark, DB Cargo, Railion The Netherlands, and SNCB (Belgium Railways). The Short Sea Shipping operation is performed by DFDS Tor Line.

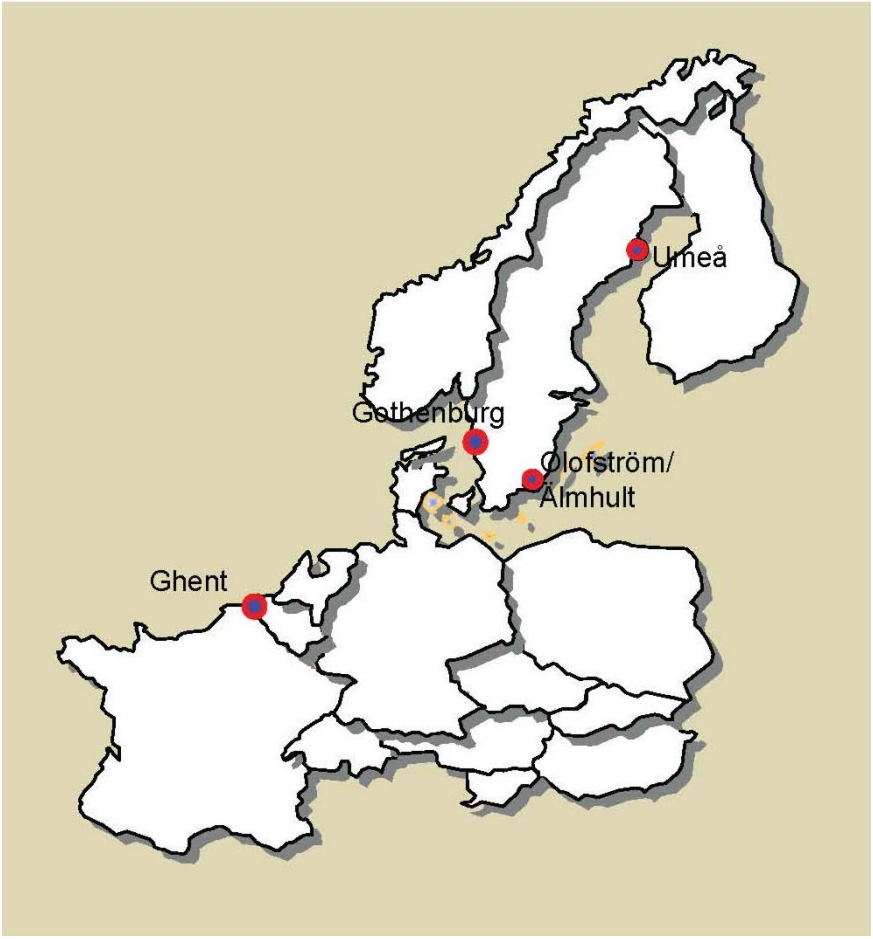


Figure 10. Volvo factories and distribution centres

The Volvo Logistics solution for transport between the factories and distribution centres mentioned above comprises two elements. The rail operation, called the “8”, operates two trains per day in each direction: Olofström- Gothenburg-Olofström and Olofström/Umeå-Ghent-Olofström/Umeå. The timetable is shown in ***figure 11***, which also indicates the reason for the name of the solution.

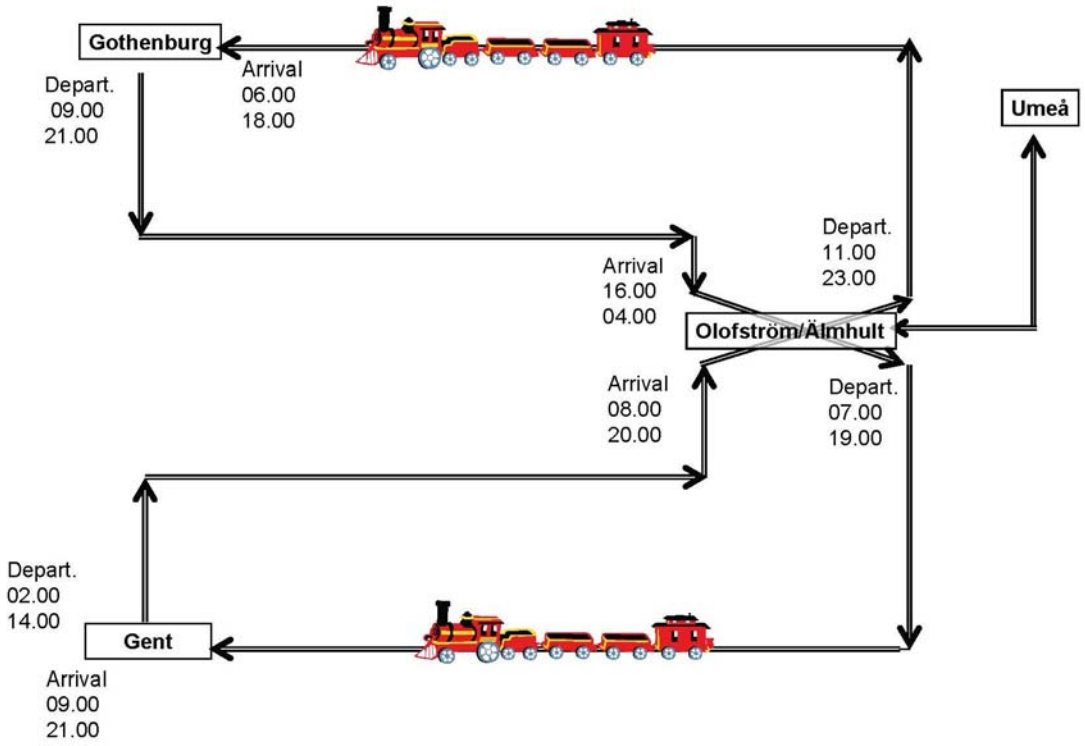


Figure 11. Time table of the rail operation "8"

Volvo Logistics acts as the manager of the supply chains, which means that Volvo Logistics is informed by the factories and distribution centres as to what cargo is to be transported when. Volvo Logistics then interacts with Green Cargo who has the complete responsibility to organise transport of cargo from origin to destination (***fig. 12***).

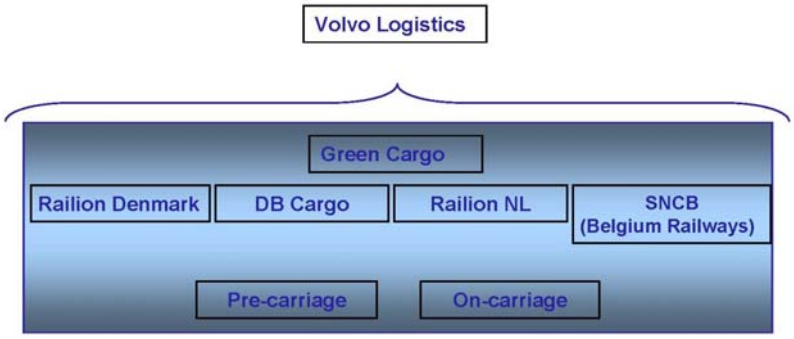


Figure 12. The responsibility to organise transport of cargo from origin to destination

The problems that were encountered during the development of the "8" rail operation are described under the appropriate heading below. To deal with these problems, a development project was established with the different actors. In this project some of the problems were overcome. As an example, a single security handbook covering the complete operation from Ghent to Gothenburg was achieved.

Volvo Logistics made a significant effort in communication with the different rail companies. The transparency along the chain increased substantially through this communication and a common success story was created (Volvo Logistics and all the involved rail companies) based on the mutual understanding of the requirements and the challenges.

Transport between Gothenburg and Ghent is crucial to Volvo's operations. As a consequence, a back-up transport solution exists between the operations in Gothenburg and Ghent using the Short Sea Shipping operation EuroBridge offered by DFDS Tor Line. EuroBridge is a relatively high frequency Short Sea Shipping operation.

The vessels servicing this operation are RoRo vessels built to DFDS Tor Line specifications. The first of the vessels operating between Gothenburg and Ghent was delivered in 2003. Hence, the vessels are basically modern. The complete Volvo Logistics transport operation between Sweden and Belgium is shown in ***figure 13***.

However, compared to the vessels operated in the Stora Enso operation, the DFDS Tor Line vessels do not have completely rectangular cargo holds. Similar constraints are also found elsewhere. As a consequence, the driving pattern for loading and unloading may be quite complex. The end result is that the cargo handling capacity for the DFDS Tor Line vessels used in EuroBridge is approximately 50% of the cargo handling capacity of the Stora Enso vessels.

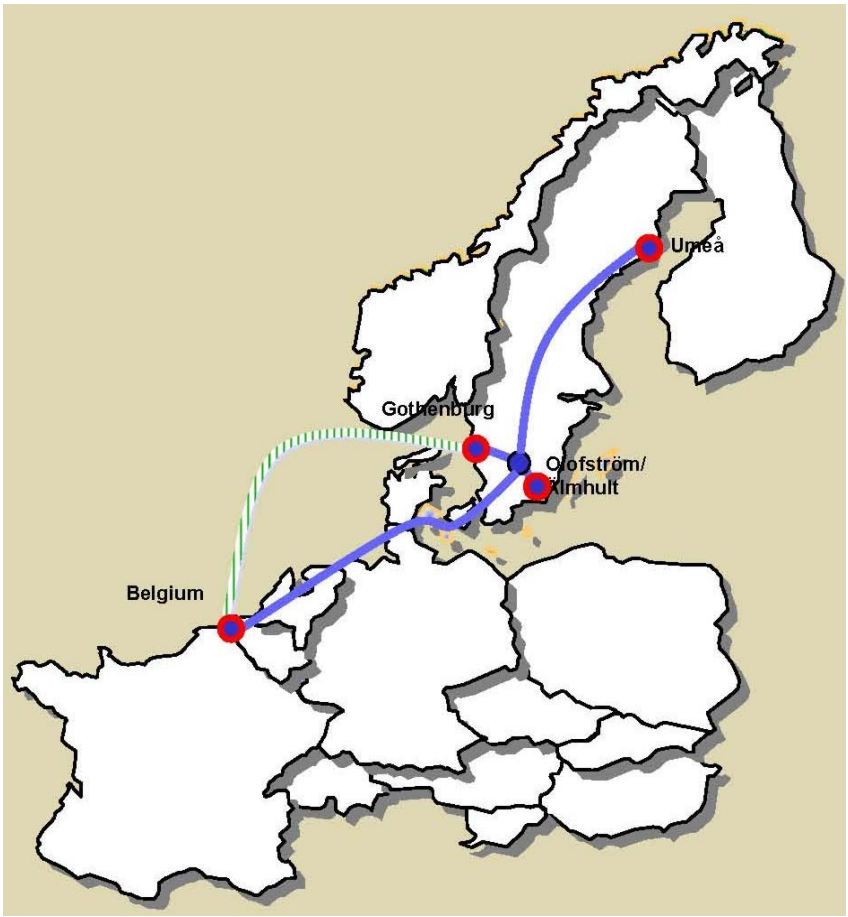


Figure 13. The complete Volvo Logistics transport operation between Sweden and Belgium

The driving force behind the solution was the cargo owner, Volvo. It is another example where a cargo owner with large volumes has the ability to develop innovative solutions. Without the participation of cargo owner(s) with a vision, the challenge of getting intermodal solutions "off the ground" is significant. The Volvo Logistics transport solution between Sweden and Belgium has been successfully in operation for a number of years.

Barriers and problems

The problems that were faced when developing the "8" train operation were:

- In the regions where the "8" is to operate, weather conditions may be a challenge even for rail.
- Governmental interference – establishing a smooth rail operation involving 5 countries required patience and determination
- Governmental demands for return on investments – led to a challenge regarding cost of operation
- In was necessary to negotiate with different unions of transport workers to secure efficient and reliable operations
- In was necessary to discuss/negotiate with many actors in the supply chain. They all needed to understand the concept and the requirements for efficiency, cost effectiveness and sustainability.
- There was no transparency between the different actors
- 5 countries and 5 languages along the transport flow.

4.1.4 REORIENT

Several rail-based shuttle services are currently in operation between countries in the REORIENT Corridor and Western Europe, but no shuttle service is provided in the North-South direction of the Corridor. Taken together, the economic importance of the REORIENT Corridor, the recent trend toward greater growth in the northbound direction, the current route choices of freight flows between REORIENT countries, and the fact that a proper rail service is missing in the REORIENT Corridor, indicate that it is possible that a new rail service could attract a considerable amount of freight from road to rail-based solutions in the REORIENT Corridor.

Reorient embedded the identified factors for attracting freight from road to rail-based solutions in a set of suggested rail shuttle services in the REORIENT Corridor:

- Swinoujscie-Bratislava/Vienna-Budapest: Full Container Load (FCL) block train dedicated to movement of paper rolls to mills.
- Trelleborg-Swinoujscie-Bratislava/Vienna: Semitrailer, Swap body on Flat Car (SFC), and full container load (FCL) shuttle train customised to needs of 3 PL and 4 PL providers who buy roundtrips.
- Gdansk/Gdynia-Bratislava/Vienna-Budapest-Beograd-Thessalonica: Mixed Container on Flat Car (CFC) and SFC shuttle train.
- Bratislava-Budapest-Bucharest-Constantia: Mixed CFC/SFC shuttle train and/or FCL (for unitised bulk). This service will compete with existing service from Rotterdam.

Figure 14. The REORIENT Corridors from Scandinavia through Central Europe and via Vienna to Constanza in Romania and to Thessaloniki in Greece.

REORIENT developed business and management models for various service concepts. An appropriate business model is important to make sure the required types of operators are involved and assigned adequate responsibilities. The complexity of the rail business and the great differences in potential participants' initial assets and financial situation make it infeasible to quantitatively evaluate generic business models. Instead the REORIENT team developed a qualitative survey questionnaire based on the elements of the conceptual framework to acquire information from respondents to make conclusions about the type of business model appropriate for the REORIENT service concept. A survey was carried out to:

- Acquire information about operators opinions on the type of business model appropriate for the REORIENT Corridor.
- Identify operators interested in investing in the REORIENT shuttle services and making use of the services.

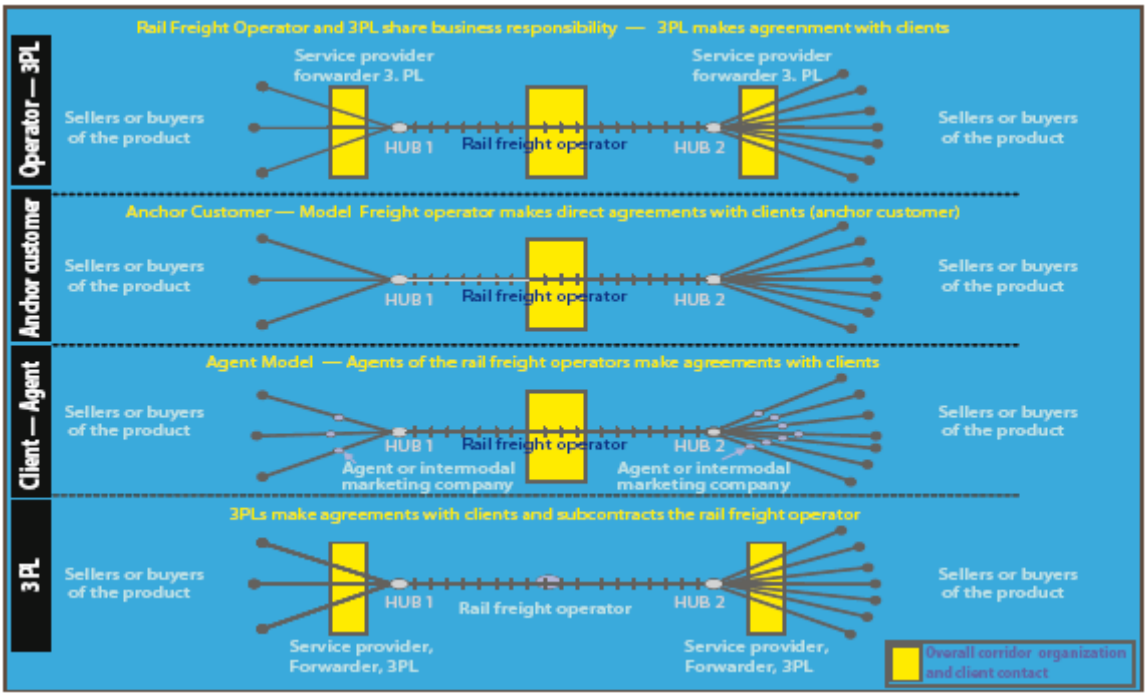


Figure 15. Different types of service models

After five years, the support for the 4th service model increases. Models 2 and 3 are also supported, especially in transit countries. Respondents assessed model 1 and 4 as the most appropriate for coexistence. The support for model 1 and 4 complies well with the situation that about 60% of survey respondents do or plan to engage in strategic alliances, networks or agent relationships, and also with the European situation that logistic companies join alliances and joint ventures with operators. Companies acquire other operators or merge in order to complement their service provision to the customers and thereby strengthen their market position.

From the survey, we find that a diversity of INCOTERMs is used for the change of ownership agreement between seller and buyer in the corridor. We found, however, that the seller more often than the buyer is responsible for planning and executing of logistic operations. The responsibility overall and in parts of the companies transport chains is also frequently outsourced to 3PLs and transport companies, which is in accordance with the archetypical models.

From the survey responses we found that the shuttle train services will improve the ability to supply goods to/from customers in the REORIENT region for 34% of the respondents and possibly for 38%. Especially Greece, Romania, Austria and Czech Republic are positive. By business unit, we found that especially 3PL companies and the transport providers are positive. Manufacturers were least supportive. One reason can be that they often outsource their need for logistics and transport. Another reason can be that they are more limited than transport companies in their number of business relations, i.e., transport companies do transport for many companies, which increases the chances that the REORIENT service concept is in one of their itineraries.

A majority of the 71 business units belong to big companies (company turnover > €100 million). The importance of the markets is apparent from answers to questions of *What would encourage you to invest in new business ventures in the REORIENT countries:* Almost 50% selected market size and scope, whereas the rest were equally distributed on institutional environment, ICT and directions from companies top management. Market

presence/expansion in REORIENT countries applies to 75% of the respondents. This confirms the analysis based on official statistics that there is a market potential for new rail-based services in the corridor.

One 3PL (with turnover > €1 billion), two transport operators and one respondent in the "other" category (with turnover in category 3) would consider to become part(owner) of the shuttle train's operating company depending on service reliability and price. Source REORIENT

4.1.5 INTERFACE

INTERFACE aimed at identifying and testing new ways to improve borders crossings terminals operations reducing customs waiting time, increasing safety, harmonising regulations and developing additional functions. Selected improvements focused on combined solutions stressing their potential at technical, economical and organisational levels. The project has the main European economical poles and high potential traffic corridors as its geographical frame in order to make possible the transferability of the tested intermodal solutions to other sites.

Main Findings

Demonstrator 1: *Intermodal management procedures at border crossing between Austria and Czech Republic* (Breclav – Hohenau).

The tools developed under the project ensured higher quality in international information interchange between ÖBB (Austrian Railway Undertaking) and CD (Czech Railway Undertaking), by means of the wagon database connection to the ÖBB production system (ARTIS) and a file management improvement for data interchange (pre advice, consignment note) via the HERMES network. The impact on the EU accession of the Czech Republic was especially in terms of reduction of stopover times at the border and delays as well as an enhancement of productivity of the engaged personnel. ÖBB and CD could adopt the new tools with other neighbouring railways. Added values activities (e.g. for dangerous goods monitoring) were also under development at time of project conclusion.

Demonstrator 2: *Development of logistical concepts at border crossing between Spain and France* (Port Bou).

The intermodal freight Tracking and Tracing quality, including dangerous goods, was enriched by the means of new tools, developed under the project, in terms of information contents, reliability and real-time availability. The related outcomes were an improved elaboration of transhipment plans and their flexibility; a decrease of plans non compliant to technical and security rules and easier transhipment planning training. The adopted solutions could be easily transferred in every Spanish Combined Transport terminal because one of the main tools is widely used since June the 1st, 2005. Outside Spain, the solutions could be fully transferable to companies operating through Port Bou, by providing to RENFE (Spanish Railway Undertaking) their wagon stock data.

Demonstrator 3 *Interactions among terminals and network at border between Italy and Switzerlan*d (Novara CIM).

Harmonization between the Information Systems interface of CEMAT (the main Intermodal Operator at Novara terminal) and of Trenitalia (the Italian Railway Undertaking) and setting of a common wagons database were deployed during the project. Those solutions

allowed, respectively, to avoid any train manual data entry and the standardisation of wagons technical data. The outcomes were the reduction of train delay from the terminal to the rail network because of human mistakes in data transfer, and the elimination of any train "weight and length check" failures. The new train composition best practice could be adopted immediately in the whole Italian CEMAT network.

Among the innovative concepts, dealing with interactions among terminals and network, two measures were also evaluated aimed at supporting a dispatcher in assigning priority slots for trains, in case of traffic irregularities: a rail traffic management tool which gives priority to one specific direction (Asymmetrical Optimization) and the design of a cyclic timetable, including alternative trains paths and rescheduling decisions. The measures outcomes, exceeding the project's time horizon, were only simulated. By giving priority to SouthNorth direction running trains, the delay reduction could be increased greatly while, for South bound trains, reduction could be lower. Transferability of the regular interval timetable to other sites could be suitable mainly for a singletrack line. For others lines, transferability of the cyclic timetable principle could be useful only if passenger traffic is already planned in the same way.

Outcome

INTERFACE project main results provide an exhaustive overview [the main EU intermodal terminals and four high potential traffic corridors (Northern Baltic region and its corridors with Russia, North-East part of Austria and its corridors with CEEC, Transalpine Arch and Pyrenean Arch with the Port Bou crossing)] of the current development of the intermodal freight transport and suggest the main measures and/or actions that can improve the efficiency and the effectiveness of the border crossing operations. In particular, they respond to the following goals:

1. Optimisation of the intermodal procedures management
2. Optimisation model for transhipment and loading planning
3. Harmonisation of the information systems among the actors of the transport chain
4. Planning of specific integrated timetables;

and even though they are addressing to specific problems solutions, they are characterised by the following common features:

1. Reduction of the bottlenecks due to the rail border crossing operations;
2. Redesign of the existing information and communication systems;
3. Promotion of he cooperation among the different players of the intermodal chain;
4. Development of a continuous improvement process (long term perspective).

The main recommendations (WP6) have been structured in five macrogroups, highlighting the issues related to the intermodal rail traffic growth; the clusters are respectively:

1. Functionality of EDI at Terminal level: meaning the capability to improve the efficiency of the Electronic Data Interchange Systems among the actors involved in the terminal operations.

2. Functionality of EDI at Network level: meaning the capability to improve the efficiency of the Electronic Data Interchange Systems among the actors involved in the intermodal transport chain.
3. Timetable Reliability: meaning the capability to achieve trains punctuality preservation and/or delays recovery, optimising rail line capacity and border crossing operations.
4. Effectiveness of Technical and Commercial Inspections: meaning the ability to improve the reliability and accuracy of train inspections.
5. Production of new intermodal services: meaning the capability to enhance the competitiveness of rail freight transport, providing "customers oriented" innovative services.

Conclusions

Since the lack of functionality in electronic data interchange at terminal as well as at network level represents a common weakness (1st and 3rd Demonstrators), the harmonisation of the Information Systems among the involved actors and the setting up also of a Central Database, can significantly enhance the efficiency and reliability of data transmission avoiding the "non added value" activities.

It Is essential to view the intermodal transport chain as a whole, researching system productivity improvement through new production models at the operational level (flows consolidation, block train services) as well as at the network level (construction of gateways/hubs).

The specific 1st Demonstrator solution to integrate the Information Systems between the Railway Undertakings of the two border countries and among them and Terminal Operators (using the whole range of capabilities of HERMES V30.1) improved planning capabilities at the terminal level, such as function of the status of the rail network (up to 20%), and reduced the waiting times in Breclav terminal up to 30-40 minutes / train.

Actors' co-operation by agreements and cross-border alliances as well as standardisation of delivery booking and/or accounting data exchange represent a useful approach to collect and share commercial and operational data.

Lack of interoperability of rolling-stock in terms of locomotive power traction, difference in drivers' training of the bordering countries (with consequence of locomotives and drivers' changes at the border station) as well as different standards in rolling stock construction affect timetable reliability. As outlined in the Nordic Case, different standards on general wagons structures, bogies and coupling and dampening system are available. In this context, a better knowledge at European level of the available capacities along selected freight corridors would increase reliability and service quality of rail freight transport.

Lack of quality trust among the involved actors causes repeated train technical inspections in this context, possible agreements among Railways Companies regarding duration and typologies of technical inspection as well as standardisation of freight trains configuration (in terms of number and typologies of ITUs) could be useful actions to improve terminal efficiency.

Optimisation of the road - rail freight transfer, dealing with the improvement of ITUs movements and storage, is supported by the design and implementation of a decision support system for transhipment planning and operation (2nd Demonstrator). In the Port Bou case the reduction of transhipment time is up to 20% and, moreover, the related processes are less dependent on staff expertise.

In a specific case (3rd Demonstrator) the railway transport chain is composed of ten actors such as four Intermodal and Terminal Operators four Railway Undertakings and two Railway Infrastructure Managers. In this framework, introduction of round tables and meetings of involved actors could generate a better co-operation.

Co-operation among the actors of the supply chain following a common strategy and defining innovative services can produce new “customers - oriented” intermodal services, enhancing the competitiveness of rail freight transport. For this purpose and related to the medium-term solution of the 3rd Demonstrator, the availability of supplementary slots due to a specific planning in the freight trains circulation could support a new commercial policy, offering patrons a wide range of “time windows” and allowing them to choose the most suitable path for the optimisation of their own freight transport.

5 POLICY STRATEGIES ANALYSIS

The first year analysis dealt with the intermodal policy in connection to the main intermodal flows in Europe. The focus was on intermodal corridors, financing of terminals, terminals in connection to ports, quality of terminals and national transport policy, based on national surveys performed by PROMIT Cluster 5.

The focus in policy analysis for the second year is the enlargement to the East. The cases deal with inland terminal (BILK), port terminal (Gdynia), national policy (Bulgaria) and intermodal rail connections to Asia, mainly the Trans Siberian Rail (TSR) connection.

5.1 BILK

For the improvement of the Hungarian logistical service centre the government, in the frame of increasing the share of the combinated transport, approved the BILK Complex Programme. The plan of the Budapest Intermodal Logistics Center dates back to the middle of 90's. In the background there's the environmental politics, which says, the most effective way to decrease the environmental pollution is to remove the truck traffic to the fringes of the city. The idea has already been approved by the government in 1993 because of the lack of business capital; it didn't started until at the end of 2001. On 19th December in 2001 the interested parties signed the BILK Combiterminal Stock Company's and the BILK Logistical Stock Company's deed of foundation.

Figure 16. BILK Combiterminal

The BILK combiterminal is about handling of accompanied and unaccompanied combined traffic in Budapest, in a modern logistic service centre. The first development phase accomplished 4 loading tracks (750 meter), handling equipment, depot, offices, customs, parking lot for trucks and maintenance yard.

The traffic increased by 25% in 2006 (2006 = 102.000 TEU) and in 2007 by 30% (2007 = 138.000 TEU). The current capacity of the BILK terminal is 150 000 TEU/year, 20 000 truck /year (rolling highway), and container storage possibility for 2 300 loaded and 3 000 empty containers. The objective is to reach the 200.000 TEU capacity by 2010.

There are many railway operators such as Eurogate Intermodal, ETS railway, Alpe-Adria, Hungaria Intermodal and Intercontainer. Interkonténer has 5 trains per week to Hamburg Waltershof central shunting railway station and the goods will be distributed from here. Hungaria Intermodal has 5 trains per week toward Waltershof.

In Hamburg the goods will be transhipped in several ports, about 56 – 58 % of the traffic from the BILK is directed to here. The second most important relation is that of the port Koper (23 – 27 %), the third one is that of the port of Triest (10 – 11 %) and then they are followed by Bremerhaven, Wels, and Vienna. Only scattered traffic is coming from Rotterdam (through Wels) and from Wels, Enns, Duisburg, etc. as well.

Figure 17. BILK intermodal connections.

The express-ship between China and Koper (through the Sueze Canal) is very expensive, since in the export traffic empty containers are also transported, and therefore the price level of the import traffic is kept at a high level. The relation Hamburg-China is less expensive. The Far-East and the Middle East relations are of importance. Containers are coming from Israel and from the Arabian Peninsula and from India; the repacking is made in Jemen and in Israel for the sake of avoiding the EU contingents.

The cost of the Budapest-Hamburg is 1050–1300 EUR/trip/TEU. This covers the costs of the traction plus the terminal cost in one direction (80–90 EUR in Hamburg in the case of export/import traffic, in the BILK this is equal to 60 EUR for the import traffic and 30 EUR for the export traffic).

Users and stakeholders

The establishing partners were MÁV Zrt., Hungarocombi Ltd., GYSEV Rt., MÁV Kombiterminál Ltd., Waberer Holding Logistic Ltd. (as of December 2005 the MÁV Cargo Zrt. became the owner). The MÁV Cargo is the proprietor with 62 %, the MÁV has no ownership-share, 18 % belongs to HUNGAROKOMBI and 12 % to the MÁV Kombiterminál (this is 100 % propriety of the MÁV Cargo). Until December 2005 the Waberer's firm had an ownership share of 5 %. The risk bearing parties of the investments are the proprietors.

Establishment of the BILK Combi-terminal and logistic terminal was financed through private capital. For the infrastructure project the same played a part (Soroksár freight yard terminal).

ICT

In 2003 the terminal controlling system was introduced, as e. g. the JOKONT 2 (this was developed in co-operation with the MÁV Informatics). There is an electronic data connection between the partners and the navigation forwarders. EDIFACT format is used. There is an XML connection in the Container Depot. The contact is assured with the operator firms, with the systems SIR, MÁV HHR. At present the Kalmar machines are being fitted with a GPS system to enable positioning of the containers. There is a similar system in Graz already in operation. This will be put into service in 2008 in the BILK terminal.

Credits

The credit is assured by the association itself. The acquisition of machines is accomplished through leasing transactions. PHARE support as well as EUR based credits have been used for this purpose. In the new development phase, credits will be also eliminated (i.e. mid-term credits as well as longer term bank credits.

The private companies enjoy preferential fees, and therefore many partners are coming through them to the BILK terminal. The costs of the combined transport terminal is very high at European level as well, which reaches the costs of the storage costs of the ports as a consequence of the small capacity, the costs of the lifting operation is 10.000 HUF + VAT (40€+VAT), and in addition to the lifting operation the railway car availability costs shall be also paid (factory siding).

The reliability of the intermodal transport relations

The customers are mainly the railway operators, the domestic and international forwarders, as well as the inland navigation companies. In the case of Hamburg sometimes delays have occurred because of the increasing traffic.This situation has become more serious at the end of 2007 due to the German, Austrian and Hungarian railway worker strikes (there have been 4-8 hours long delays as well).

The quality of the services is good only at the private railway companies (+/- 1 hour). The daily traffic is low with traction capacity problems in Slovenia and in Croatia. At the private railway companies 2 loc-drivers are working, and so there are no cases, where the working time of the drivers is over during the transport operation. The companies have line locomotives as well. In Hungary the Eurogate private company is the most important partner. The Boxxpress (who provides locomotives along with, its sub-contractor Hungarian Floydm, who supplies the loc-driver) is also of importance. Wiener Lokalbahn has operated trains as well.

The private railway companies have three current-system locomotives. Communication is resolved with the aid of the safety devices (in the languages of 24 countries), and the traction infrastructure is also good. see
http://www.bilkkombi.hu/index.php?id=97

5.2 Case Poland; Gdynia

The share of combined transport in Poland was 1.7% in 2005, and the trend is increasing. The combined transport operations are still only a marginal part of railway operations. The infrastructure programme includes 10 sections of railway lines, 13 terminals for combined transport, 10 railway border points and 2 stations for gauge change. Transit position of Poland enables to join in the development of freights in relation East-West and North-South, thereby to stimulate development of rail and maritime connections. Source. Nawracki / A. Sztybor, Ministry of Transport, Poland.

There are 72 railway freight transportation licences, 21 active carriers and 9 licences for infrastructure management In Poland. The market share of state owned companies was 83% and private owned 17% in 2006. Source: Piotr Dybowski CTL

The port of Gdynia is a good example of an intermodal port hub development. The port has a market share of almost 50% in the general cargo in Poland, the others being Gdansk with 10% and Szczecin-Sw with 40% of market share. The unitised traffic has increased very fast and totalled 460000 TEUs in 2006. Most of the units were containers; the number of swap bodies has been decreasing during the last years.

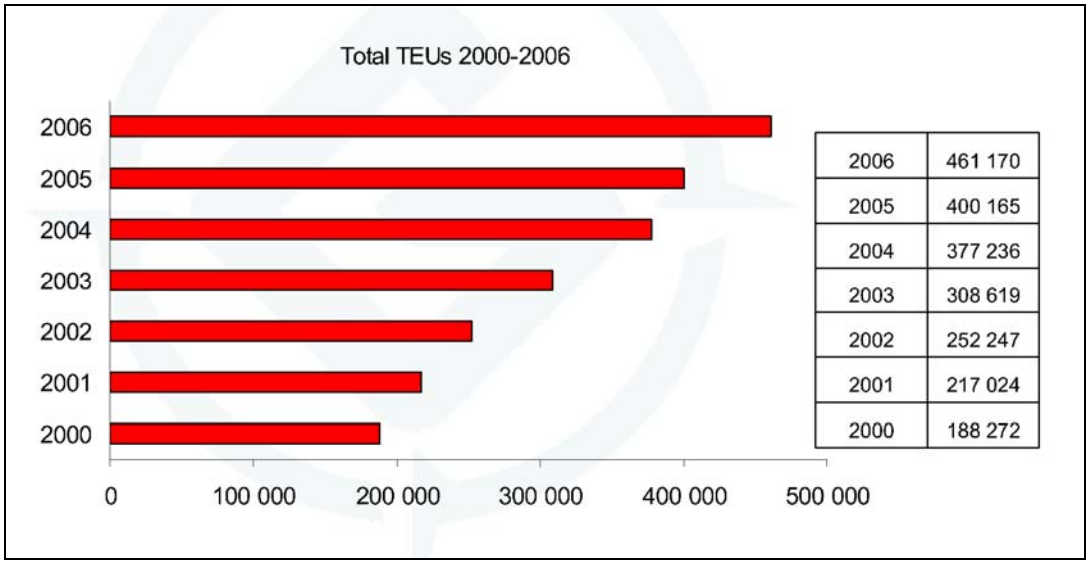


Figure 18. Intermodal units counted in TEUs in the port of Gdynia. (Source: Przemyslaw Marchlewicz)

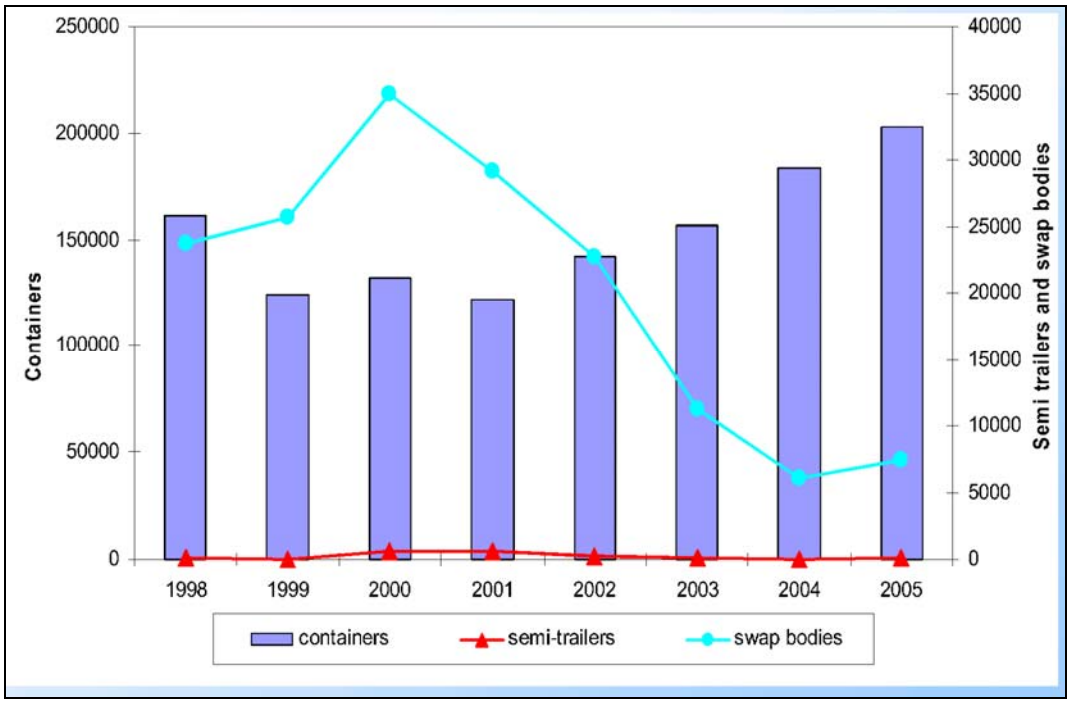


Figure 19. Number of intermodal units in the port of Gdynia. (J. Nawracki / A. Sztybor, Ministry of Transport, Poland)

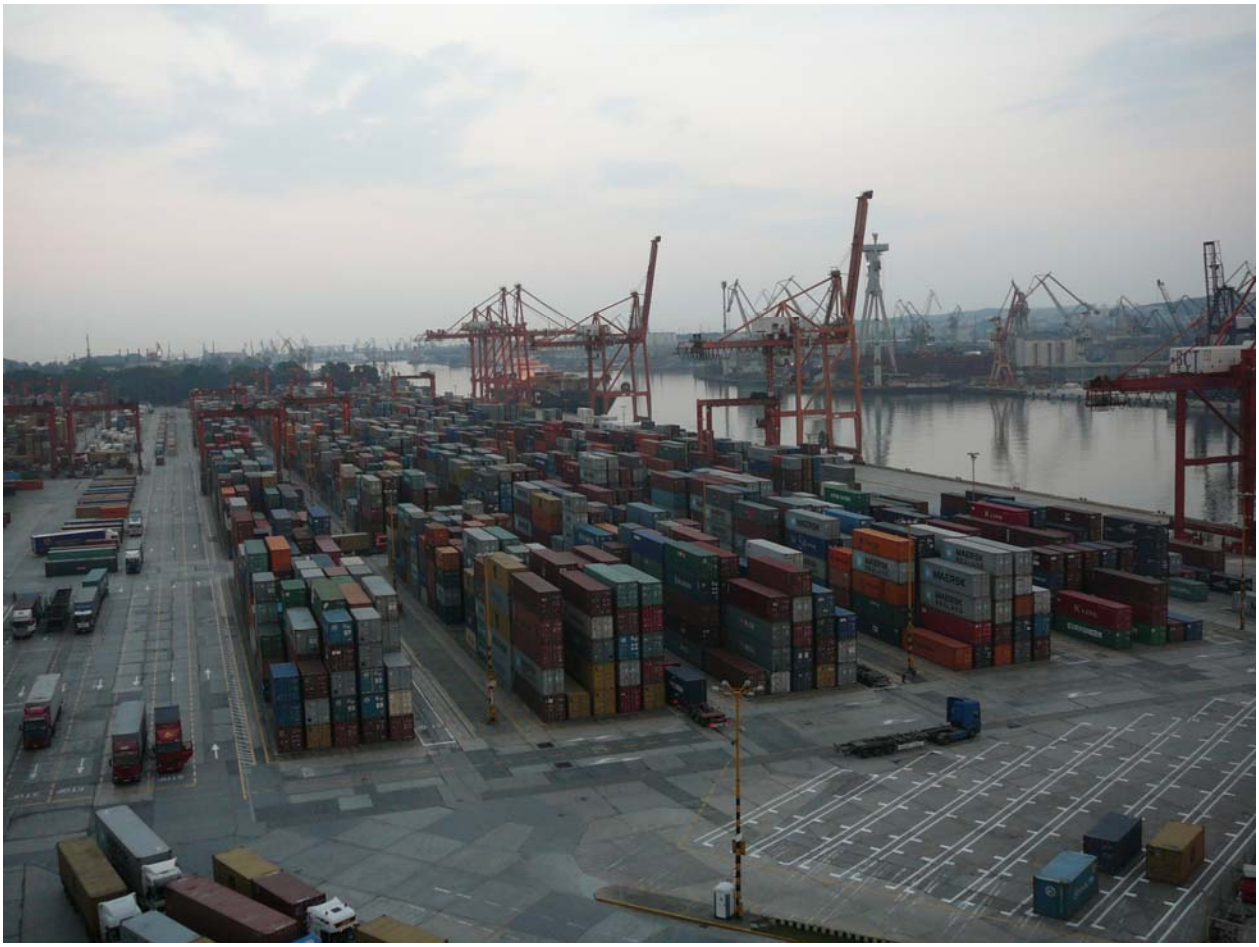


Figure 20. Port of Gdynia intermodal terminal.

5.3 Case Bulgaria

Balkans Intermodal & Logistics Conference in 2007, a joint event with PROMIT project, gave a picture of the Bulgarian intermodal developments.

Key point in this process is availability of good quality of infrastructure to secure best conditions for freight transportation through Bulgaria and to give an opportunity to attract additional freight traffic. The projects which will be realized in the period 2007–2013 for modernization of the transport infrastructure of Bulgaria are subject of the developed Sectoral Operational Program on Transport and currently are in process of negotiations with European Commission. The ambition is to create optimal conditions for development not only of transport infrastructure toward priority Trans-European directions, but also of extremely needful intermodal terminals and their development into freight villages.

Key process, seen from the Bulgarian transport policy point of view, is in integration of transport system of Bulgaria to the transport systems of the Member States of the European Union. Bulgaria will respond adequately to the increasing interest of foreign companies toward logistics market. Source Peter Mutafchiev

Intermodal system infrastructure basically consists of railways linkages between major nodes for freight transport. The infrastructure modernization includes the following:

- Technical improvement of the railways and railway facilities as a part of the Trans-European Transport network
- Ensuring the necessary gauge clearance for the intermodal and combined freight transport

Creating of intermodal terminals has been started. There are planned two intermodal terminals in sea ports Varna and Burgas – each with a capacity of 500 000 TEU, also in port Varna West – 150 000 TEU, two inland ports with multifunctional terminals in Lom and Rousse – each with a capacity of 100 000 TEU. Several intermodal terminals/freight villages are in process of being built in Sofia, Plovdiv, Stara Zagora, Dimitrovgrad and Gorna Oriahovitza - main nodal points of European freight transport corridors. Other infrastructure projects, supporting the intermodal transportation are:

- Improvement of navigation in the Bulgarian- Romanian sector of the Danube River;
- Establishment of a River Information System / RIS for the Bulgarian sector of the Danube River; Information System for Vessel Traffic Management

The railway transport market in Bulgaria is open for freight transportation from 01.01.2007. The railway administration prepares a new Programme on development and support of intermodal-combined transport in Bulgaria. A new Bulgarian company for combined transportation will be formed. The main railway carrier, Bulgarian State Railways is transformed /restructured, and BDZ Cargo is established as a railway freight carrier. The process of buying of 6000 freight wagons in 10 years is catalyzing. Three new private railway freight carriers are licensed.

5.4 Tracing and tracing – case Railtrace

RailTrace is a consignment and wagon tracking and tracing system and has been operational since December 2000. RailTrace covers transport between Finland and Russia. The system is open for other stakeholders and negotiations are ongoing with different European Railways. Message exchange with a Ferry Company and German Wagon Keeper has been in production. RailTrace serves all modes and means of transport.

RailTrace is an open messaging and tracking system over the Internet. International rail traffic requires efficient ways to control the international logistic chain. Biggest problem was the lack of information; needs for better customer service, better control over the goods flow and better information flows. The purpose of the RailTrace is to cover railway transportation from/to European Union to/from Russia and to serve as centralised database to administrate and monitor all information related to the wagon and customer consignment. It manages consignment information from its origin to the ultimate place of delivery monitoring the movement and status of both the vehicle and the consignment.

Targets

- To give European customers access to international wagon and consignment tracking covering both Europe and Russia

- To integrate both consignment and wagon information
- On-line exception reporting
- Increase railway's competitiveness against other modes of transport
- More reliable East-West rail transportation.

The project Co-ordinator is VR Ltd Finnish Railways, VR Cargo and main partner is OAO RZD Russian Railways. The target user groups are Railway Undertakings, Infrastructure Managers, Logistics Service providers, Authorities, Wagon Keepers and end customers in all participating countries. VR is the owner of the system and service provider. Partners are responsible for the accuracy of the information. The initiative was taken by shipping company Finnlines. The company was responsible for the train ferry traffic between Germany and Finland. Information entered into the system is based on existing messaging; no external information input or dedicated devices is needed. Licence or ASP service is available.

RailTrace was the core system in the CroBIT project. Comparison between various similar services was done during this project. see http://www.crobit.org/

Services

RailTrace gives answers to questions e.g.

- Where is my wagon/consignment/container?
- Which wagons are arriving e.g. Chiasso?
- RailTrace is extendible to other modes of transport, e.g. road haulage. The service is capable of relating various waybill types and various wagon numbers to one consignment. Information is based on file exchange only, no manual data entry needed but possible.
- RailTrace integrates wagon and consignment information from various sources. RailTrace facilitates better control over the goods by combining online status information from various European railway operators and other logistics service companies.
- Provides exception reports whenever delays in transport are expected.
- Increases speed and reliability of rail freight traffic.
- Assists users to plan their freight operations better.

RailTrace service is implemented in co-operation with other European railways logistics service companies, and RailTrace Partners. Information is exchanged every time consignment or wagon data is processed:

- at departure
- at border crossing
- at reloading
- at arrival
- at agreed control points.

Information from checkpoints above is entered into a centralised database. RailTrace has been developed especially for Internet Explorer 4.0 and Netscape 4.0 and for the later version of them.

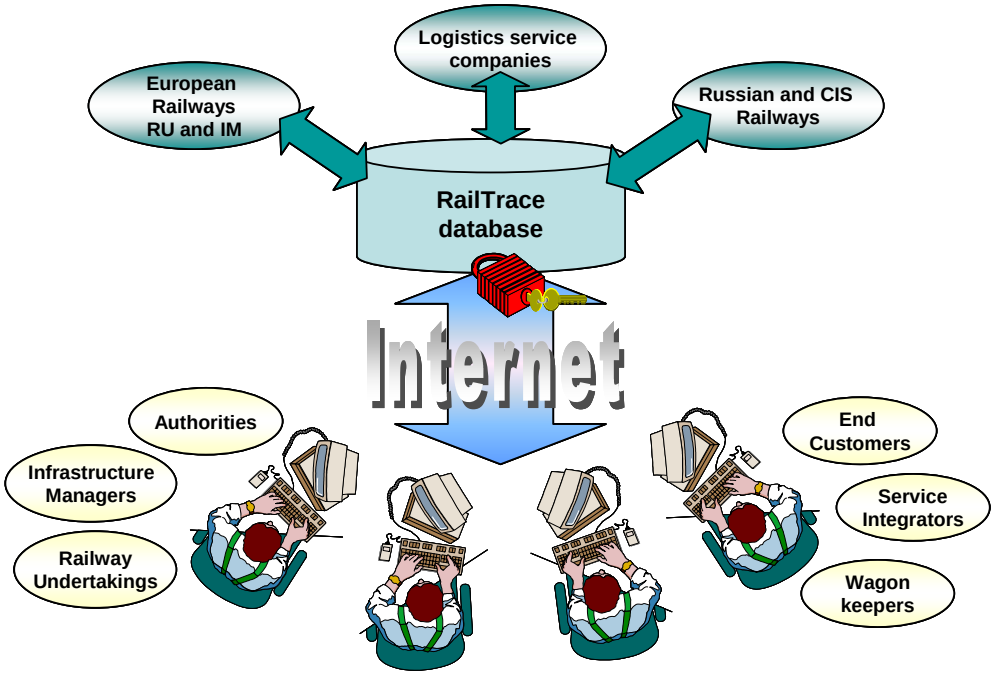
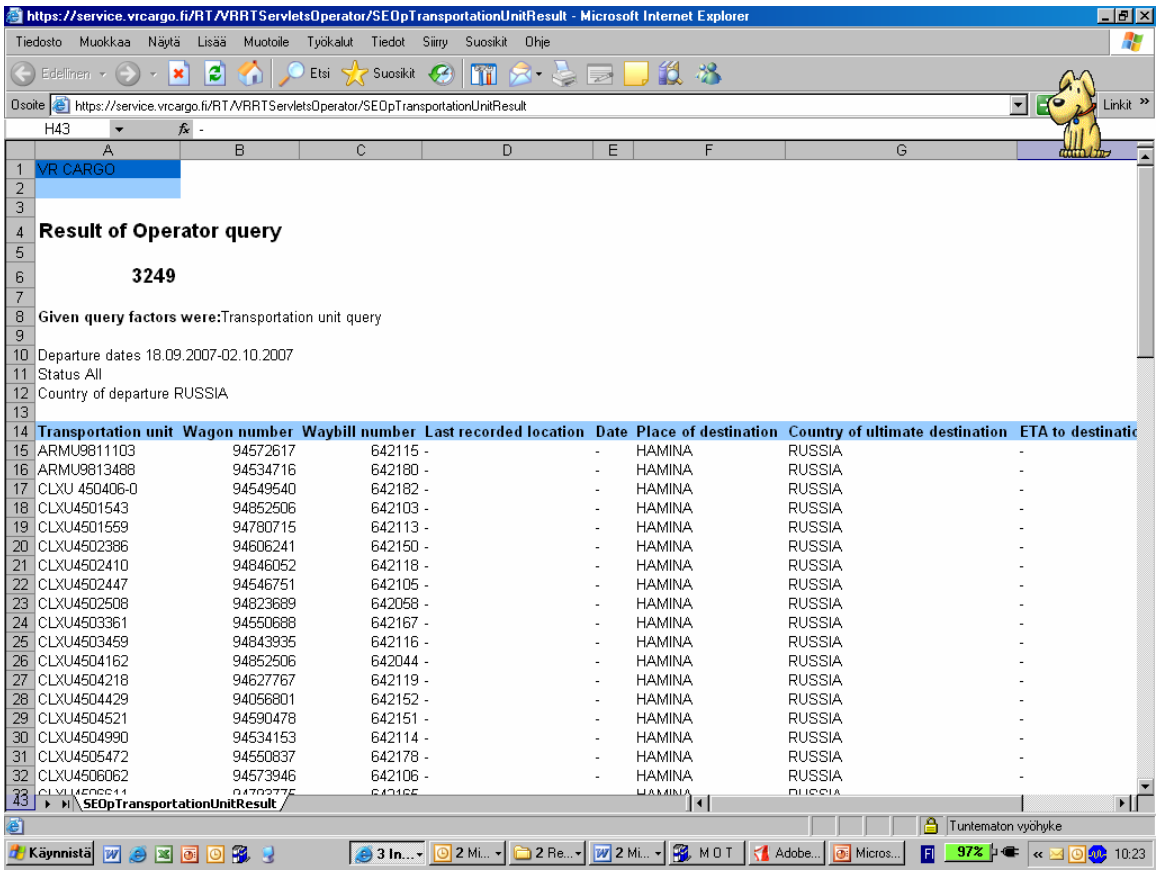


Figure 21. Railtrace structure.



Transportation unit	Wagon number	Waybill number	Last recorded location	Date	Place of destination	Country of ultimate destination	ETA to destinatic
ARMU9811103	94572617	642115	-	-	HAMINA	RUSSIA	-
ARMU9813488	94534716	642180	-	-	HAMINA	RUSSIA	-
CLXU 450406-0	94549540	642182	-	-	HAMINA	RUSSIA	-
CLXU4501543	94852506	642103	-	-	HAMINA	RUSSIA	-
CLXU4501559	94780715	642113	-	-	HAMINA	RUSSIA	-
CLXU4502386	94606241	642150	-	-	HAMINA	RUSSIA	-
CLXU4502410	94846052	642118	-	-	HAMINA	RUSSIA	-
CLXU4502447	94546751	642105	-	-	HAMINA	RUSSIA	-
CLXU4502508	94823689	642058	-	-	HAMINA	RUSSIA	-
CLXU4503361	94550688	642167	-	-	HAMINA	RUSSIA	-
CLXU4503459	94843935	642116	-	-	HAMINA	RUSSIA	-
CLXU4504162	94852506	642044	-	-	HAMINA	RUSSIA	-
CLXU4504218	94627767	642119	-	-	HAMINA	RUSSIA	-
CLXU4504429	94056801	642152	-	-	HAMINA	RUSSIA	-
CLXU4504521	94590478	642151	-	-	HAMINA	RUSSIA	-
CLXU4504990	94534153	642114	-	-	HAMINA	RUSSIA	-
CLXU4505472	94550837	642178	-	-	HAMINA	RUSSIA	-
CLXU4506062	94573946	642106	-	-	HAMINA	RUSSIA	-

Figure 22. Railtrace web view for a user.

Status

Expansion to Eastern traffic started with Data specifications agreed with RZD. Test messages exchange started in 4th Q2003. Tests with real-time messages from pilot routes started 2nd Q2004. At the present moment message exchange is in full use in production environment.

Status messages are received from departure, border crossing and arrival events. Status messages are sent also from Finnish main marshalling yards Kouvola and Tampere and St. Petersburg marshalling yard if the wagons are bypassing these stations. Expansion to receive status messages from major marshalling yards in Russia is ongoing. Exception report message content, if something unexpected occurs along the transport route, has been agreed. The realisation timetable of the exception reporting is year 2008.

Next phase of the project is the expansion to cover T&T in Western traffic and other CIS and Far-East traffic. Negotiations with various partners are ongoing.

Benefits

The concept serves customer requirements for visibility in intermodal transports covering all modes and integrating both consignment and wagon information. The system covers 80

% of requirements for all railways mandatory Wagon and Intermodal Unit Operational Database specified in TAF TSI.

Railtrace enables control of wagon and consignment movements, based on existing messages. No extra manual input or technical devises are needed. VR recommends other railway undertakings to join this system or to guarantee interoperability of their own system with Railtrace.

Frequent information exchange minimises risks of loss and gives an option of security services - RailTrace is a missing link to European consignment tracking and tracing. Improved electronic data exchange between Russian and Finnish Railways and usage of international standards in data exchange creates a solid ground to expand the project initiative to other railways in neighbouring countries and the Far East.

By receiving information about the incoming goods before the physical arrival of the goods railway companies may send pre-arrival notices to their customers, logistics service providers and other partners and this way better serve the whole logistic chain. Information received in advance reduces the turnaround time at border crossing stations, making it possible to allocate resources and pre-plan operations. Freight delivery times in railway services between Finland and Russia and further on to/from Far East have reduced. see www.railtrace.com

5.5 Intermodal connections to Asia

This chapter is based on the PROMIT Seminar "Connecting Europe and Asia with Trans Siberian Rail (TSR)" which was held in Helsinki 14th of February 2008.

5.5.1 Introduction

Railways are challenging the container shipping companies in the Far East transports. The markets in the Far East are closer than earlier and traditional operations models are being challenged. The Far East – Japan, China and Korea – have always been a significant trading partner for the Europeans. Traditionally, logistics to and from these countries have been handled through ocean transports via the Suez Canal or round Cap Horn to Europe or through different combinations of air and ocean transports. First, the goods have been transported in containers to the Middle East and then further by air to the markets in Europe.

Using these routings, transit times from a Chinese ocean harbor to Europe varies between 15 day and 4-5 weeks. Combined air-sea solutions have in the first place been used for relatively high value added goods, normally not for voluminous goods. Mainstream goods – low or medium-high value added goods and voluminous goods – are normally channeled to deep sea transports and usually they are transported in containers from the consigner to the consignee. In urgent cases or in cases, where the value added to the product is really high, the goods flow is usually steered to pure air transports – where the costs are extremely high, but transit times short, 1-2 days.

Traffic balances are a challenge with substantial financial impact. As strong exporters, China, Korea and Japan present a significant challenge and an additional cost component when the logistic chains are being evaluated – the goods flows are heavily imbalanced. Therefore, in order to meet the export needs, container shipping companies need to transport in the worst case 70-80 empty containers from Europe for every 100 export containers. Also, the airlines experience the same problems as the aircrafts fly from Europe to the Far East only to fly back 'swollen' in maximum weight. This imbalance always implies additional costs.

The pirates want to get their share of the growing flows. As for the ocean transports, a new-old threat has emerged in the last years – pirates. Incidents were especially smaller container ships have been attacked in order to be robbed, have increased imminently. Source Timo Jaakkola DHL.

5.5.2 Promoting TSR - CCTT

The Coordinating Council on Transsiberian Transportation (CCTT) was established in 1993. The objective of CCTT is to attract cargo to the Trans Siberian Rail (TSR). The function of CCTT is to coordinate the activities of the members in bringing cargo to the TSR. The Russian railway system has presently 85,600 route kilometers. The TSR originates in Moscow and extends down to the Far East, to Vladivostok / Port Vostochny (the gate to the TSR) covering 9982 km. The TSR runs through 20 administrative entities and connects 5 federal districts of the Russian Federation. The TSR is the key link connecting the transportation systems of the Far East and of the Asian/Pacific Region with the transportation system of Europe. TSR has double track which is electrified till Brest. The price of transit transport shipment is 900 US dollars and the price for import / export is double. In addition to this you have to add all pre-haul and end- haul costs.

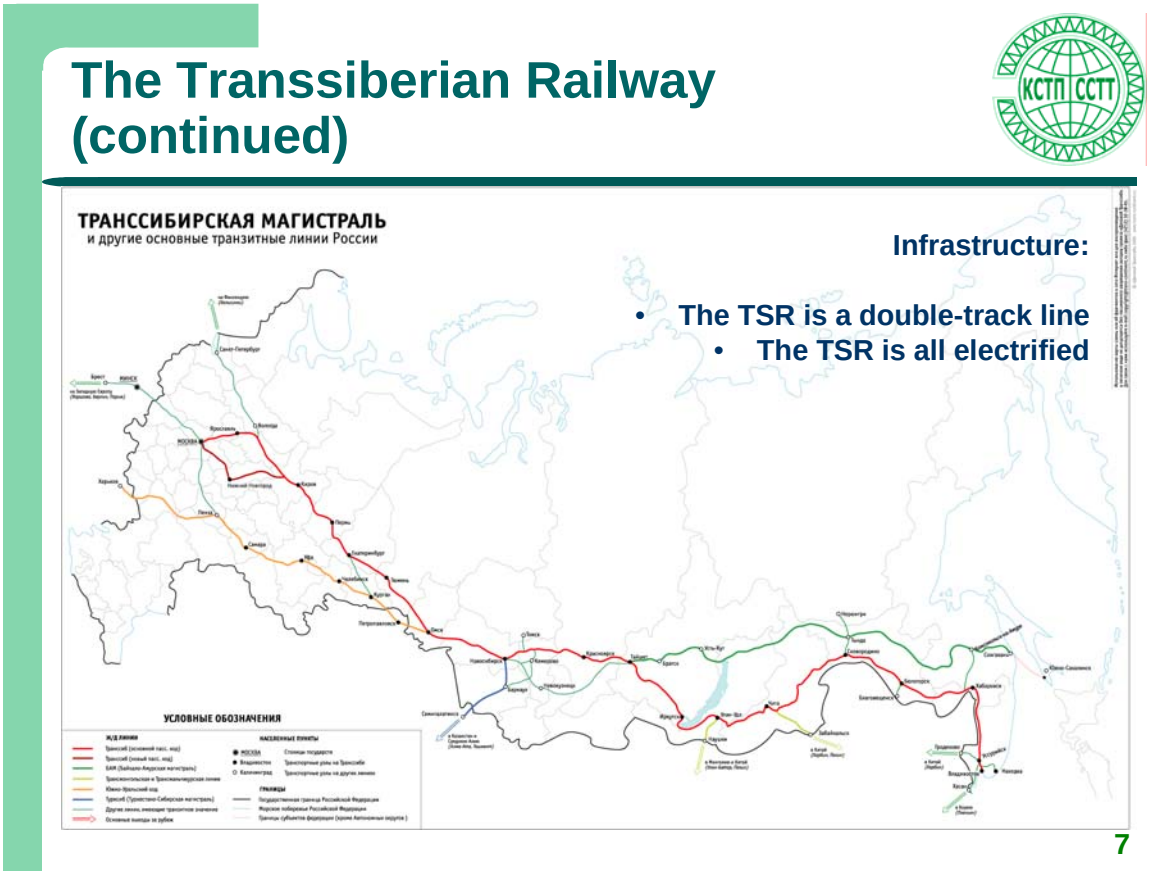


Figure 23. Trans Siberian Rail.

The actual volume of cargo transported in 2007 on the TSR via Far-Eastern ports was 621 000 TEU (+ 48% compared to 2006). The volume of transit traffic was 38 000 TEU (-5%). The reason for the decline of transit volumes is the non-competitiveness of the TSR through rate compared to the freight rates of the deep-sea shipping companies.

The TSR has capacities to transport up to 130 million tons cargo per year, including about 500.000 – 600.000 containers with import/export cargo and 250.000 – 300.000 transit containers. The TSR handles presently about 50% of the total volume of import and export cargo of Russia. The TSR together with the Baikal-Amur mainline are capable of transporting up to 1.000.000 TEU per year

One of the strategic objectives of the Joint Stock Company 'RZD' is integrating the rail system of CIS, Europe, and Asia. Railways of CIS, Baltic countries and Finland have the 1520 mm gauge. This gauge might be extended Kosice to Bratislava and Vienna.

Strategy up till 2030 contains modernisation up till 2015 which means growing capacity. Radical modernisation up till 2030 is planned mainly in Asian part of TSR. see: www.transsibcouncil.com

5.5.3 Demonstration Train Beijing – Hamburg Port

The Russian railways in cooperation with the railways of China, Mongolia, Belarus, Poland, Germany and the JSC 'TransContainer' have carried out a demonstration run of a container block train from Beijing to Hamburg. The train consisting of 49 container carrying flat wagons with 98 TEUs departed from Beijing on January 9th 2008 and arrived in Hamburg on January 24 covering a distance of 9780 km in 15 days. The train crossed the railways of countries China, Mongolia, Russia, Belarus, Poland and Germany.

- Transport volume: 98 TEU
- Commodities: Building materials, foodstuffs, automotive parts, metal products.
- Customers: One shipping line, two forwarders
- Final destination of containers: Germany, Austria, Poland, Czech Republic, Denmark, Sweden
- Pricing was below seafreight rates but the pilot train was not reflecting actual costs.
- The information exchange as well as customs procedures were not piloted.

It is the explicit intention of the railways to make this train a regular product within the next two years.

Figure 24. Pilot train Beijing – Hamburg Port.

Lessons learned

- Fast transit times are technically feasible.
- Documentation needs to be improved, much depends on a reliable and qualified partner at the starting point of the train.
- Border crossing needs to be closely monitored, nothing should be taken for granted.
- Interest among shippers and forwarders for such a service is very high.
- Pricing should be not significantly above seafreight level as the customers‘ willingness to pay for faster transit time is limited. (Source Jaakkola DHL)

5.5.4 VR Cargo Services

TSR traffic between Asia and Finland had a steady growth until 2004 when a volume of TEU 125.000 was reached. Due to traffic disturbances the volume dropped to TEU 100.000 in 2005. After the tariff increase in January 2006 the traffic collapsed to TEU 8.000 and the negative trend continued in 2007, when the transports dropped further to TEU 2.650. The traffic in the traditional form has reached the end of its life cycle. In the old business model the cargo was transported into Finland by rail and moved back to Russia by trucks. This traffic has stopped.

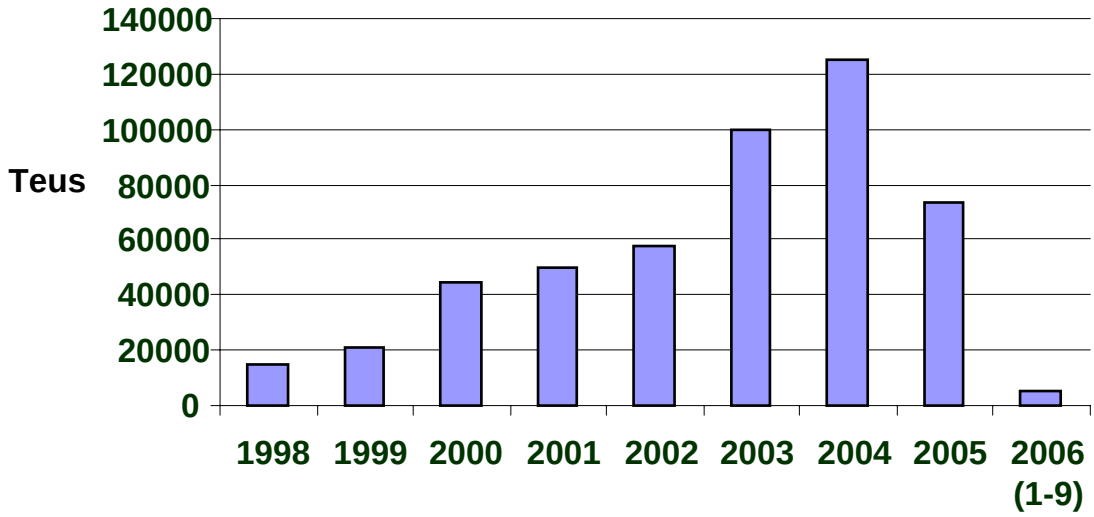


Figure 25. VR, Vainikkala Trans-Siberian railroad statistics.

Transit transport to/from Russia via Finland totalled 3.5 million tons in 2007. Main articles were metal industry and oil / chemical industry products.

Due to the railway reform in Russia the whole picture has changed. The container platform fleet of the Russian Railways (RZD) has been transferred to OAO TransContainer, a daughter company of RZD that was established in July 2006. This company will focus on development of own comprehensive services and it will not support its competitors by allowing them to use its platforms like RZD did. The old TSR players need to develop new solutions.

The Finnish VR Cargo is very committed to its cooperation with RZD. JV Oy Container-Trans Scandinavia Ltd was established in 2006 / 2007 for marketing of container transports including TSR traffic in Finland. VR will, however, support private Russian container platform operators operationally although not commercially in the Finnish territory. Rail infrastructure has four border crossing stations between Finland and Russia and two rail ferry connections.

Future opportunities and challenges include TSR transport via Vostochny and Zaibaikalsk/Manzhouli. New solutions have to be developed, the old world will not come back. Finnish volumes are not enough, at least Scandinavian volumes have to be combined to the Finnish ones. Today's total costs are too high, all parties involved must contribute. Tariffs are regulated by the state (transit tariffs by the Traffic Ministry; export, import and domestic tariffs by a separate Tariff Administration Office). Smooth customs clearance procedures are a must for restoring the transit traffic.

A pilot train between China and Finland is planned. There is also the discussion about a HUB for TSR traffic in Finland. Source Matti Andersson VR.

5.5.5 POLZUG services

POLZUG Intermodal GmbH was founded in 1991. POLZUG today is a joint venture of PKP Cargo S.A., Warszawa, HHLA Intermodal GmbH, Hamburg and DB Logistics Intermodal, Berlin. POLZUG Intermodal is the market leader in scheduled rail container ser-

vices between North Sea Hub Ports, Poland, Russia, the Caucasus and Central Asia. Four times per day container train departures from Hamburg to Poland, Lithuania, Ukraine v.v., four times per week from Bremerhaven and Rotterdam v.v. On-carriage is done by rail to/from Russia, Moldowa, Caucasus, Central Asia, Mongolia, Afghanistan, China. The traffic volume was 150 000 TEU in 2007.

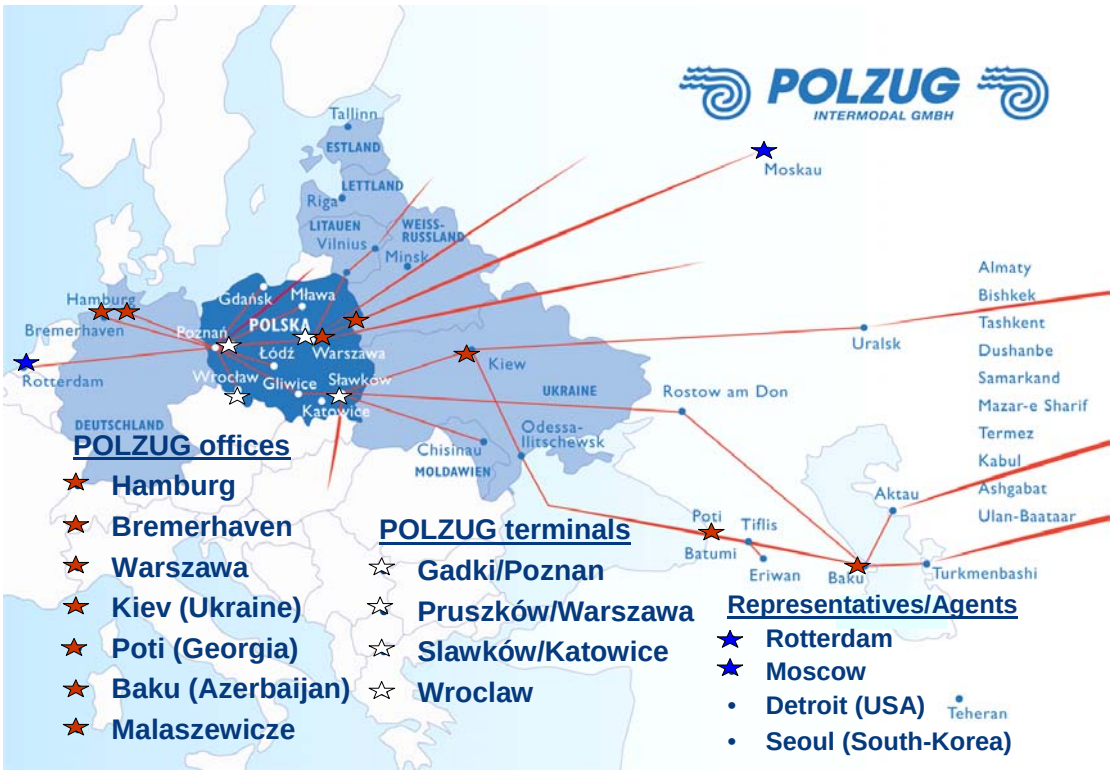


Figure 26. Polzug services.

Good Perspectives for Rail Transport are foreseen. Increasing demand for container handling in North Sea ports may lead to further quayside capacity constraints. Feeder vessels have to compete with overseas ocean carriers for berthing time and usually are forced to wait thus compromising their time schedules.Container terminals in Europe have modernised and upgraded their rail handling facilities in order to prepare for expected handling growth and relieve quayside congestion. More and more investors are detecting Russia and Ukraine as interesting countries for investment into labour-cost effective production facilities. The introduction of road Maut tariffs in EU countries as well the enforcement of driver protection rules such as restriction of driving hours may further enhance the attractiveness of containerised rail transport chains. Source Marcel Sames Polzug.

Figure 27. Transcontinental Routes via Belarus, Baltic Ports and Ukraine 1.

Figure 28. Transcontinental Routes via Belarus, Baltic Ports and Ukraine 2.

5.5.6 East-West Transport Corridor (EWTC)

According to research performed by Baltic Sea Region (BSR) transport experts (Baltic Outlook) it is estimated that the total international trade volume in the BSR is expected to grow by 54% between 2003 and 2020. In particular East-West transport is expected to grow substantially, because transport flows between Russia, the Black sea region, Caucasus, Central Asia, China and other parts of Far East on the one hand and Europe on the other, will also continue to increase rapidly.

The East-West Transport Corridor (EWTC), running from Esbjerg (Denmark)/Gothenburg (Sweden) to Vilnius in Lithuania, has the potential to serve the increasing needs of East - West transport capacity across the Baltic Sea and further onwards to the Far East and the Black Sea Region. This corridor has, due to its geographic location and the possibilities for clustering traffic volumes, a potential for developing cost - efficient services.

Main Objectives of the East-West Transport Corridor (EWTC) are the business and logistic development, preparation for investments in order to reduce bottlenecks, intelligent transport system development and joint strategy for the development of East-West Transport Corridor. The project network consist of private companies, ports, municipalities, regions,

railway administrations, road administrations, ministries and universities from Lithuania, Sweden, Denmark, Russia, Belarus, Ukraine and China. Main outcomes of the Project are an instrument of spatial integration, co-modal transport network development, success stories, long-term corridor development strategy, action plan and BSR – China co-operation. The main Bottlenecks include tariffs, customs, documents which are not harmonized, bureaucracy, different cultures and language skills.

In 2007 a feasibility study suggests logistics centres around the biggest industrial centres (Vilnius, Kaunas and Klaipeda). There is a belief that financial model for co-operation of private and public capital should contribute to the successful functioning of those centres. Newly established Lithuanian Intermodal Transport Technology Platform is standing on the position of strong promotion of the development co-modal transport and logistics hubs in Lithuania.

Container train “VIKING” on route Odessa-Kiev-Minsk-Klaipeda is transporting 20, 40 and 45 foot universal and special containers, trailers, trucks and semi trailers. The distance between Odessa and Klaipeda is 1734 km and 52 hours. The shuttle train Merkury is connects Lithuania and Moscow.

Figure 29. Shuttle train “VIKING”

Figure 30. Shuttle train "MERKURY"

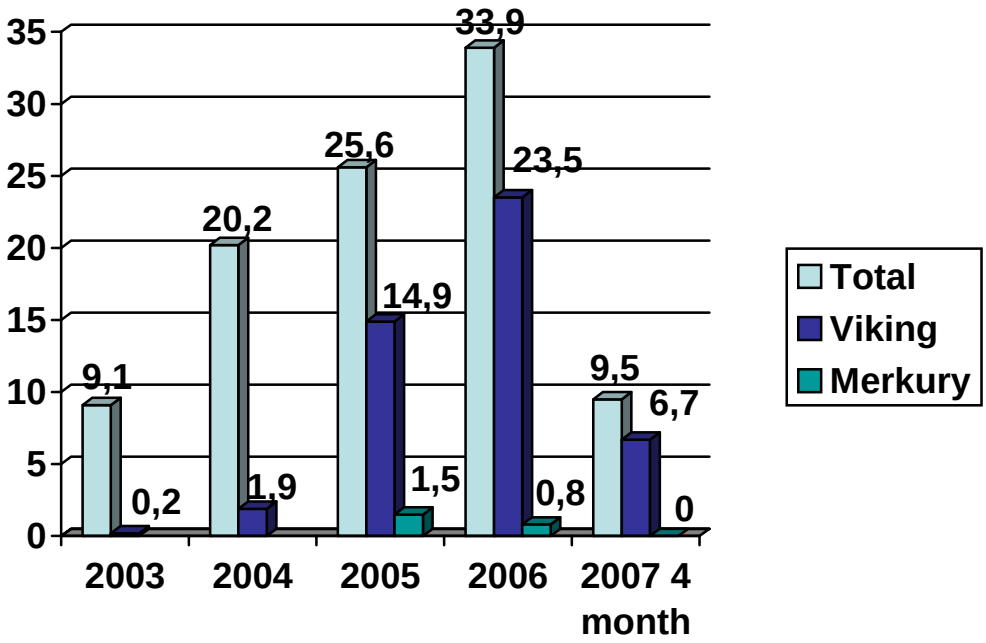


Figure 31. Traffic on East-West corridor.

The vision for 2030 is that the East-West Transport Corridor is an efficient transport corridor with close co-operation between interlinked hubs; meeting the marked demands for growing freight transports to and from Scandinavian and Lithuania in a more environmentally friendly way. The corridor stands out as a green corridor and is a part of the Trans-European Network (Northern axis). Source Algirdas Sakalys VGTU.

5.5.7 Demonstration Train Lianyungang (China) - Moscow

On ninth of October 2007, the first container train started from Lianyungang in China and arrived at Moscow 15 days later. The 8301 km route took 16 days from China, through Kazakhstan, to Moscow. This is 20 days less than by sea and 10 days less than TSR. The cost was 500-800 USD less per container than the competing routes.

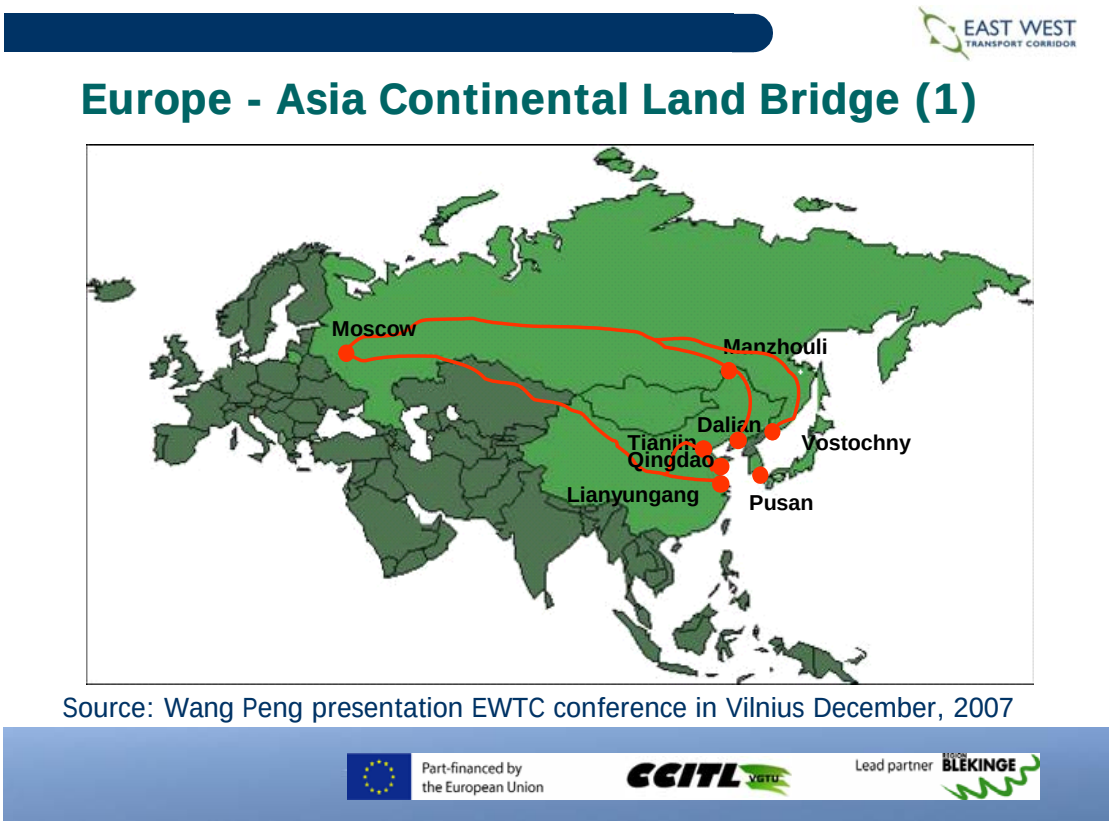


Figure 32. Europe-Asia continental land bridge.

5.5.8 Far East Land Bridge

Far East Land Bridge Ltd offers a new solution based on the idea of providing container transport from supplier's cargo railway station to buyer's cargo railway station using the European network, the Trans Siberian Railway and the China railway network. As Russia, Ukraine and Belarus operate on a wide gauge railway, while China and Europe use standard gauge tracks, containers are transferred from wagon to wagon at existing cargo/container terminals at the border between China and Russia and between Ukraine or Belarus and Poland/Slovakia/Hungary. Heavy containers up to 30 tons gross weight are no problem on the land bridge route. The Far East Landbridge acts as a neutral service provider and provides services exclusively to forwarders.

On the western side the Far East Landbridge serves Central European countries like Austria, Hungary, Czech Republic, Slovakia, Poland and Germany, with Northern Italy and France coming within range once the new Barcelona – Kiev rail corridor is operational. Container transfer to and from wide gauge rail wagons is carried out at the container ter-

minals at Cop / Zahony (Hungary), Cop/Dobra or Cierna (Slovakia) and Brest Malaszevicze (Poland).

On the eastern side the Far East Landbridge serves Beijing and the provinces of North East China, in particular the cities of Shenyang, Fushun, Changchun, Harbin and Qiqihar, with container transfer at Manzhouli / Zabaykalsk. In the near future we hope to use also the Mongolian route via the terminals at Erenhot / Erdene.

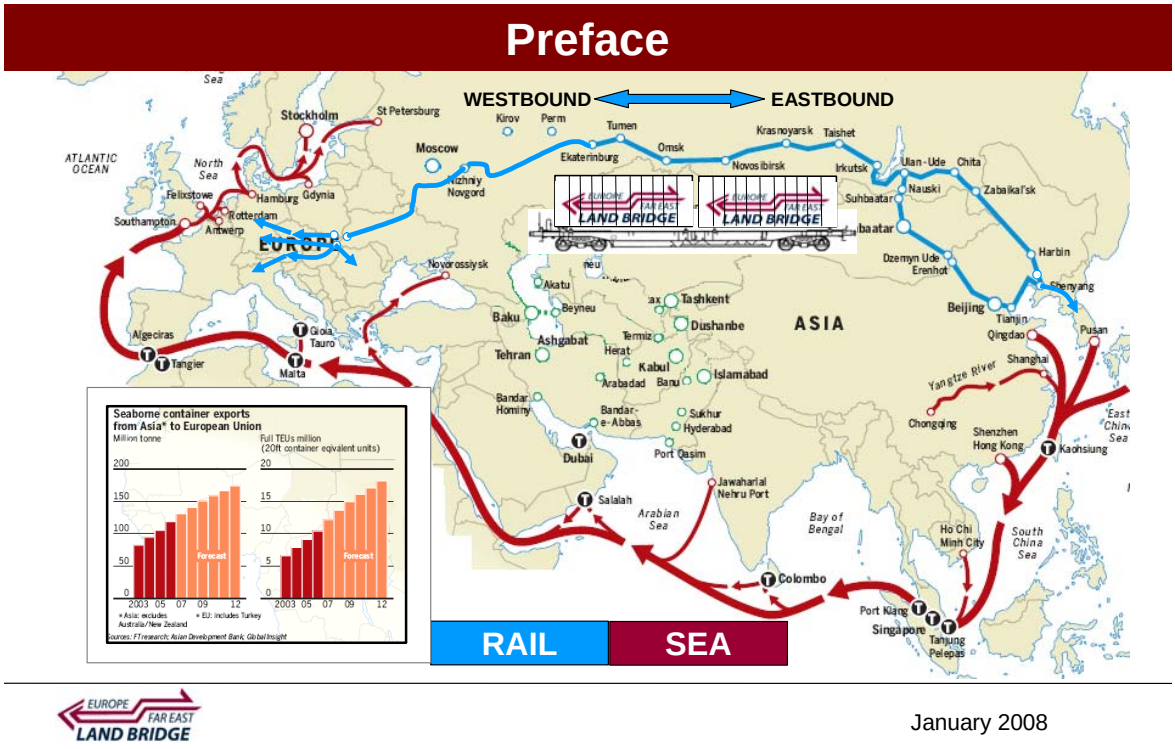


Figure 33. Far East Land Bridge

A single Way Bill will be issued for the container's entire route, using an NVOCC (non vessel operator common carrier) E-D (Electronic – Document). First class insurance has been arranged to cover the service. Most importantly of all, the transit time will be roughly HALF that of the ocean route. Transit between Beijing and Vienna, for example, will be as little as 15 – 18 days for a route of about 11,000km.

The Far East Landbridge's container control centres in Europe and China are coordinated, and monitor containers, rail wagons and trains allowing the client to track progress of his own consignment online. The control centres prepare all the documentation including manifest, rail wagons and container lists, and agreements with clients. Authorized freight forwarders can issue Way Bills (as agents only) through the link with control centres. On the wide gauge section of the route, our service will be by block trains without stoppages and handling. All containers are monitored at 37 checkpoints, at least twice a day. Security is provided throughout the wide gauge section of the route by the Russian Railways (RZD), and all transit is covered by insurance.

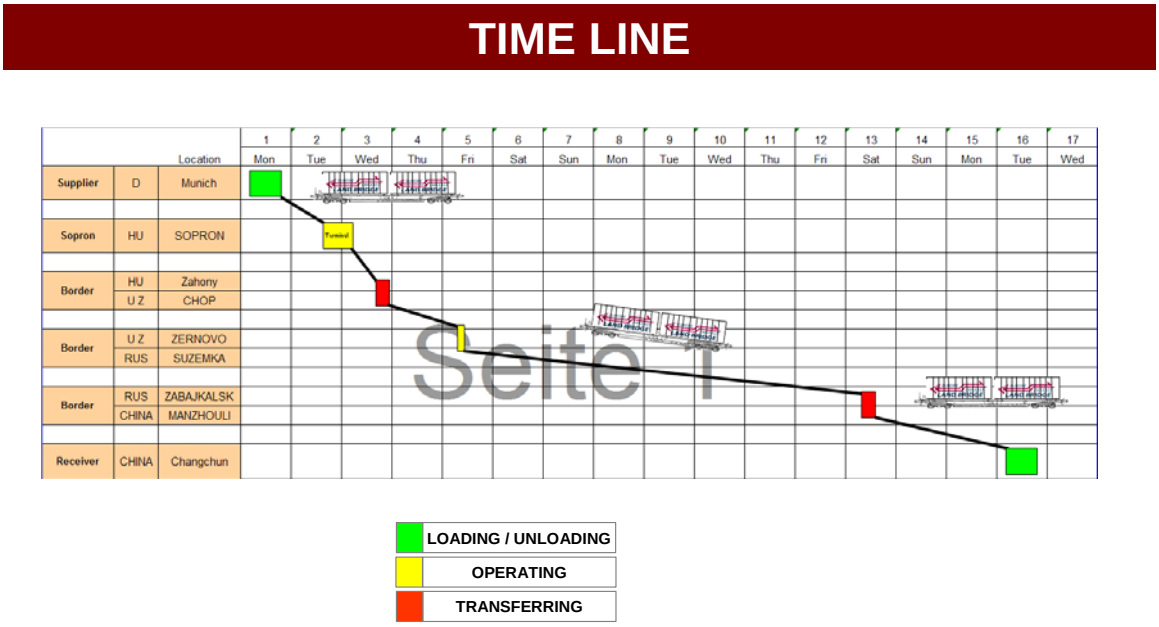


Figure 34. Far East Land Bridge time line.

There are no practical weight limitations. The shipper can load containers up to 30 tons gross (including weight of containers). For example, a load of 100 tons can be stuffed in 4 containers on the Land Bridge route while on the ship you must load 6 containers. This means a saving of 50%. The transport times are shorter to receivers of goods, as little as half the time of the ocean route. The total freight costs per ton are lower. Final destination can be changed by cargo owners during the transit. Since less shifting between modes is needed (rail, port, feeder vessel, port, ocean vessel, port and rail), therefore the risk of short shipment is significantly reduced. The Way Bill can be issued on delivery of the container at the cargo rail station at the supplier's home town, instead of waiting for the loading of a ship. The rates are flat without drop off charges. Containers will be returned to the rail station of FCL delivery. The service is operating weekly from May 2008 and there will be three departures at the end of 2008. Source Thomas Kargl FarEast Landbridge.

5.5.9 SME 3PL service provider - case Polar Logistics Group

Polar Logistics is a SME service provider. Annual sales was ~30 million € in 2007. The growth rate is 20% - 30%. Polar Logistics is a flexible, small-company customer service culture with "can do" attitude. Added value is built on comprehensive (3PL) logistics solutions.

Polar Logistics provides comprehensive, tailor-made supply chain solutions to clients who value their shipments to Russia and to the CIS territory. The important viewpoints are to concentrate on comprehensive supply chain solutions, choose where to add value, own critical success factors (assets), create sustainable partnerships and co-operation, insure critical parts of each supply chain, turn information into knowledge and know-how, control continuosly, be prepared for sudden changes and keep different options open. Source Jouni Ritola Polar Logistics.

Figure 35. Trans Siberian Railway service.

Figure 36. Trans China Railway service.

5.5.10 3PL service provider - case Kuehne + Nagel

The global logistics network of Kuehne + Nagel Group offers today 830 offices in more than 100 countries and over 48,000 specialists. Kuehne + Nagel is non dependant on agents and is non-asset based. Kuehne + Nagel is ranked no. 1 globally in sea freight, in the global top 4 in air freight, top 3 in contract logistics and top 7 in European Overland Operations.

Kuehne + Nagel intermodal operations cover in Europe cover the Rotterdam – Enns connection and four connections in UK. Shanghai – Helsinki by deepsea supply chain takes 36 days today. From draft booking to loading it takes one week and the transit time is 29 days, 25 from Shanghai to Hamburg and 4 days from Hamburg to Helsinki.

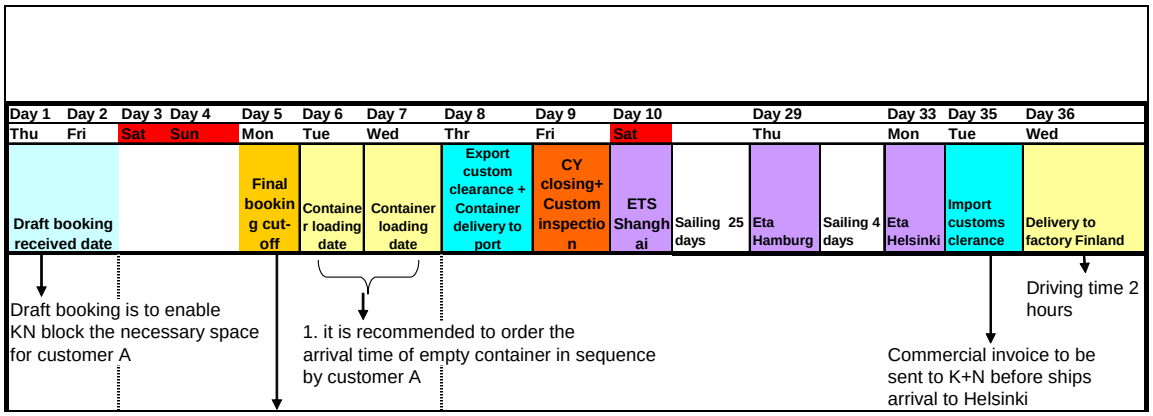


Figure 37. Shanghai – Helsinki by deepsea process flo.

At the moment, Kuehne+Nagel's does not see TSR as a competitive route compared to deep sea choices. The reasoning for this is competitiveness in rates, compared to sea route actual rates and long term rate reliability, transit times door to door, risks at reloading / shunting locations (Vostotsny, borders), reliability of TSR service in customers minds and long term commitments by service providers.

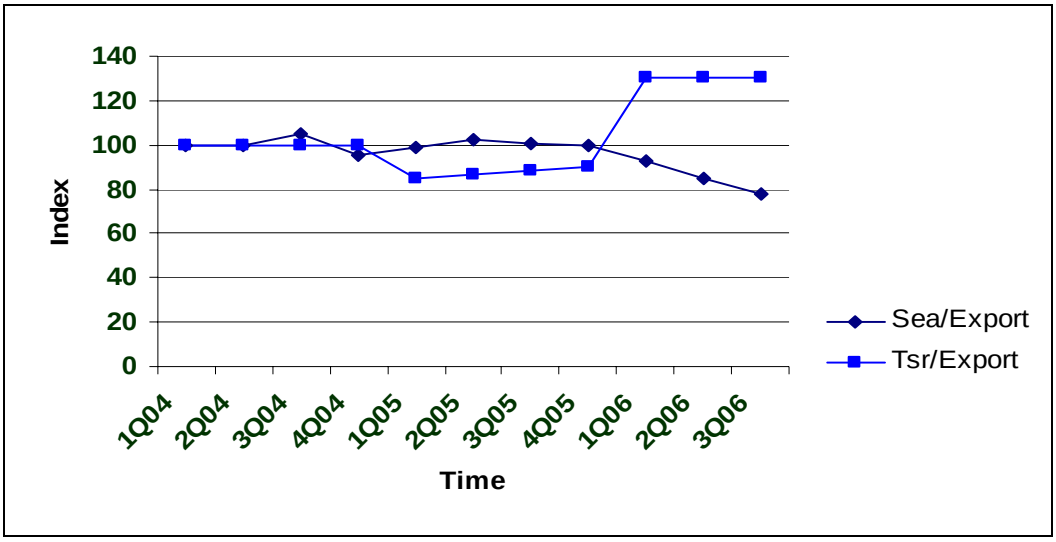


Figure 38. Comparison of 40' cont. freight development DEEPSEA and TSR Helsinki/Vainikkala –> Shanghai 2004 – 2006.

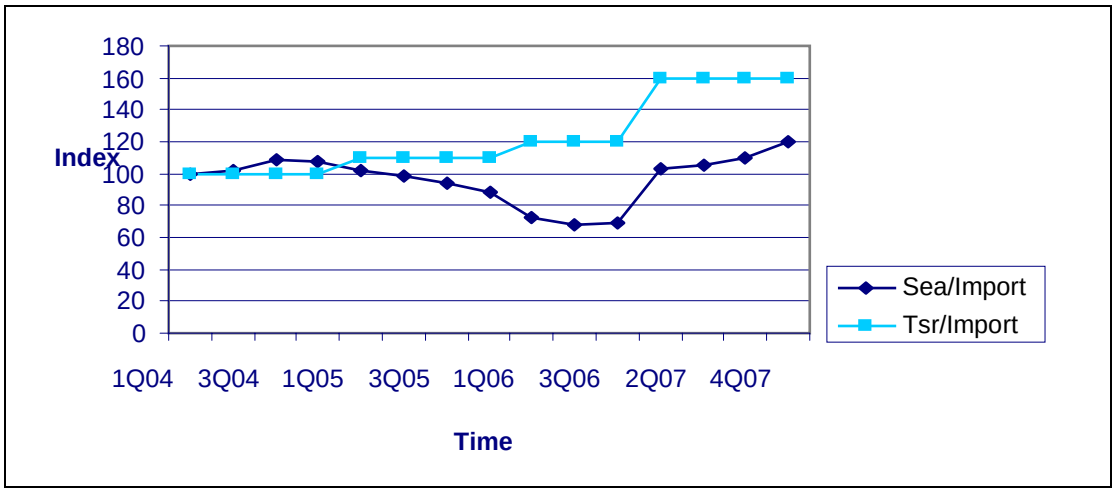


Figure 39. Comparison of 40' cont. freight development DEEPSEA and TSR Shanghai –> Vainikkala / Helsinki 2004 – 2007.

Kuehne+Nagel has carried out a customers inquiry (788 responses) for expectations of TSR via Finland. The most important criteria, according to answers, were reliability, competitiveness, RZD operations and transit time. The answers said e.g. that the cost is too high and transit time range is too wide. Source Markus Nyman K+N.

5.5.11 Rail service provider approach, case Oy Railtrans Ltd

Oy Railtrans Ltd is owned by VR Cargo 50 % and NTR (Sweden, owned by Green Cargo) 50%. Railtrans has been involved in TSR traffic since early 80's. Railtrans is specialized in logistic solutions connected to railways.

Westbound traffic on previous TSR (before 2006) was electronics from China and Korea to final destination in Russian market and small volumes of consumer goods for the Finnish market. East bound traffic was forest industry products such as paper, cardboard, pulp, sawn timber, log houses. Wagons were supplied by RZD, while containers were supplied

by various container operators. Time scheduled traffic allowed the traffic to be planned which led to growth.

Present TSR 2008 westbound traffic consist of small volumes of electronics with a final destination of Russia and in the eastbound direction small volumes of loghouses. Wagons are supplied by various operators; Transcontainer, DVTG etc. Containers are supplied mainly by shipping lines, partly used as a safety valve for shipping lines. Traffic operates totally without a schedule and it is impossible to even estimate transit times for smaller amount of containers. Freight rate is not competitive.

In future on TSR there will be main rail cargo flow from and to China. The importance of the Vostochny route will decrease and the Zabaikalsk / Manzhouli route will increase volume. Cargo through Finland will also include volumes from Scandinavia, both eastbound and westbound. There will be scheduled trains were container operators, forwarders can buy space from trains. TSR must regain the reputation as a reliable transport route.

Areas of development include rate levels which must be transparent but also stable to be competitive, co-ordination of train capacity, capacity in Vostochny, Zabaikalsk, and in other possible border crossings, utilization of the potential that exists, short transport time and quick transit customs clearance. Quality of the whole TSR service concept is judged by the performance that the weakest link in the chain is able to produce. Source Mats Johansson Railtrans.

5.5.12 3PL service provider - case DHL

On the markets there is a call for a new service concept. Time is money – and money usually allows to buy time. By offering solutions with half the normal transport time one could at least in theory imagine that these new service providers, when managed well, can produce the services at an interesting price level. That price level, which is above the present container rates, would also clearly be interesting both for the service provider and the service user.

Traditional transport flows are being reshaped. The new route alternatives open new possibilities. Tuning is todays' word. Opening of new connections to China, in the future also to Vietnam, North and South Korea shows the world from a new perspective. Why steer the fast growing, immense volume stream to the Russian market through Europe when Russian harbours can not handle even the present volumes? Why not to choose a faster way to Russia – on train directly from the Far East? Till 2012 we have a different transport network to our disposal.

There is a growing demand on different rail routes – whether it is the conventional Trans Siberian Route, a new pilot Beijing – Hamburg route or a rail route to South Korea that perhaps one day will be launched. The prerequisite for success is the fulfilment of customer expectations. DHL believes that the new railway connections can be competitive if:

1. Transport times are competitive – not more than 14 –16 days - and tenable
2. Safety of transports is guaranteed
3. Tariff policy is long-termed and predictable

4. The services are user friendly - less bureaucracy than we now are used to
5. Needed transport documentation including border crossing is simple and in accordance with international customs of the trade
6. Shipments can be tracked and traced
7. There is enough capacity on the route
8. Services are developed customer oriented and together with the customer
9. Trains / capacity available for those who are interested (no monopoly) to equal commercial terms.

A bare rail connection to the Far East is not enough. The different rail gauges inside Western Europe require alternative solutions. Use of block trains or wagons with interchangeable bogies or efficient cross docking terminals where containers can quickly and cost-effectively be moved from one wagon to another. Seamless co-operation between the different railway companies at the border stations. These tasks have to be solved to secure a seamless transportation

The recent news tells us about Tallink-Silja's plans to end the train-ferry traffic between Finland and Sweden in the turn of 2008-2009. Stopping of this train-ferry traffic means breaking the most practicable rail connection from Finland to Sweden, Norway, Denmark and further to the continental Europe. This would also stop railway transports from Finland using the west connection – leaving the east routing still open. Source Timo Jaakkola DHL.

Figure 40. An example of DHL routes to Asia via Russia 1.

Figure 41. An example of DHL routes to Asia via Russia 2.

5.5.13 Conclusions

Traditionally, trade between China and Europe is based on sea transportation. More than twelve million TEUs are shipped by large container ships to and from a few hub ports on each continent. Feeder vessels are serving the minor ports from and to hubs. For example, on this multimodal transportation transit time between Dalian and Vienna can take more than 6 weeks with a sea voyage of over 20,000 km

In principle all routes (Trans Siberian Railway, Trans China Railway and TRACECA for Asian Cargo) are equally technically feasible, but there are some bottlenecks:

- Closing gaps in the railway infrastructure is only slowly under way.
- Border crossing facilities (e.g. transhipment facilities) are still a major bottleneck of the system, especially between China and the broad gauge railways.
- A variety of agreements between railways have been
- Unified documentation, clear liability rules, transparent customs procedures are still missing.

Major issues to choose between different routings

- Final destination of the cargo. For transports to Central Asia and the Caucasus, TRACECA is recommended, while for transports to West Russia and Europe, four op-

tions exist: via China - Kazakhstan, via China – Mongolia, via China – Russia (directly linking to the TSR) and the traditional TSR from Vladivostok.

- The TRACECA route from Korea/Japan across the Caucasus to Europe is currently uncompetitive due to sky high rail ferry rates in the Caspian and Black Sea. Approximate price level is 1000 $ on Black Sea crossing and 800 $ on Caspian Sea crossing.
- The balance of flows

It is the vision of the railways to have daily trains between China and Western Europe in both directions. Source Jaakkola DHL

6 CONCLUSIONS

6.1 Market strategies

The **HUPAC** group is a European wide intermodal operator. Its target is growing in the market with consequent extension of the network and optimizing intermodal operation. The adjustment from national to international integrated traction is tantamount to a revolution on the European rail landscape. Every railway partner had to acquire a Multi-System locomotive for the European electrical Network. The current change of locomotives at the borders had become unnecessary which has meant that the productivity of the traction has been improved. One railway only is responsible for the traction and is the only contact for this connection. Train, waybill and customs data currently sent to up to five different railway and customs offices can be co-ordinated in future via one interface. This saves money and time for everyone concerned. In 2006 612000 trucks could be shifted from the road to intermodal transport. In terms of IT-applications, HUPAC uses the system e-train (also e-Goal) (Fig. 5). HUPAC introduced its GPS based system e-train in 2006. Trains are equipped with a GPS sensor. So the positions of all trains are known. This data goes into a software platform called GOAL (Global Application for Logistics). GOAL is also connected to CESAR.

CORY is a UK company transporting domestic and commercial waste on the Thames River. They have 7 tugs pulling 47 barges and the annual volume is 650,000 tonnes of waste per year. The company has invested in a number of areas to improve their services. The future of transporting waste on the Thames River appears to be secure, because it is sustainable and efficient method for moving waste across London. It is estimated that transporting this waste by river removes 100,000 heavy goods vehicle movements a year from London's highly congested roads, equivalent to 400 trips per day. London's streets are highly congested so using the centrally located River Thames is an attractive option in terms of reducing both direct and external transport costs.

Recognising the fact that **Volvo**'s factories are "peripheral" in relation to customers, the company perceives a distance handicap compared to the competition. In peripheral regions there are few transport alternatives to choose from and these have typically low frequencies. On the other hand, transport efficiency is decisive to compensate for the distance handicap of the Volvo factories. In practice these factories have to pay transport costs twice, both for sourcing of material and for the finished products. The Volvo Logistics solution for transport between the factories and distribution centres comprises two elements. The rail operation, called the "8" (the physical shape of the network), operates two train per day in each direction: Olofström- Gothenburg-Olofström and Olofström/Umeå-Ghent-Olofström/Umeå. Volvo Logistics acts as the manager of the supply chains, which means that Volvo Logistics is informed by the factories and distribution centres as to what cargo is to be transported when. Volvo Logistics then interacts with Green Cargo who has the complete responsibility to organise transport of cargo from origin to destination. Transport between Gothenburg and Ghent is crucial to Volvo's operations. As a consequence, a back-up transport solution exists between the operations in Gothenburg and Ghent using the Short Sea Shipping operation EuroBridge offered by DFDS Tor Line. Volvo´s case is a good showcase for efficient intermodal solutions. The benefits lie in the reliability with is

better than 95%, the solution is environmentally friendly and the solution is flexible and able to handle fluctuations in volumes.

Several rail-based shuttle services are currently in operation between countries in the **RE-ORIENT** Corridor and Western Europe, but no shuttle service is provided in the north-south direction of the Corridor. REORIENT developed business and management models for various service concepts. The complexity of the rail business and the great differences in potential participants' initial assets and financial situation make it infeasible to quantitatively evaluate generic business models. In the 3PL business model the 3PLs make arrangements with clients and subcontracts the rail freight operator. Support for the 3PL business model as the best model in increasing. Other models are 1) operator – 3PL model where the rail freight operator and 3PL share the business responsibility, 2) anchor customer where the freight operator makes direct agreements with clients and 3) agent model where the agents of the rail freight operators make agreements with clients. All these models are possible in practice. The REORIENT corridor is still waiting for realisation.

INTERFACE aimed at identifying and testing new ways to improve borders crossings terminals operations reducing customs waiting time, increasing safety, harmonising regulations and developing additional functions. One of the barriers in railway border crossings is the lack of functionality in electronic data interchange at terminal as well as at network level. The harmonisation of the Information Systems among the involved actors and the setting up also of a Central Database, can significantly enhance the efficiency and reliability of data transmission. The specific solution to integrate the Information Systems between two Railway Undertakings of the two border countries and among them and Terminal Operators improved planning capabilities at terminal level and reduced the waiting times in terminal up to 30-40 minutes per train.

The first evaluation for recommendations, using the PROMIT Steering Committee criteria (table 2) and second year best practice cases shows that all cases fill several criteria. The evaluation will be developed during last PROMIT year.

Table 2. Evaluation of best practice cases.

	Hupac	***Volvo***	***Cory***	***Interface***	***Reorient***
Open architectures, standardisation, interoperability	**	*(*)	**	**	**
Acceptance of all EU members	***	***	***	***	***
Public subsidies should treat all operators fairly	?	?	**?	?	**
SMEs should be included	***?	*	***	***?	**
EU wide view of national support actions	?	?	-	?	*
The role of promotion centres - One European voice	**	-	?	-	*

* = low - = not relevant
** = medium ?= not known
***= high

6.2 Policy strategies

The Hungarian government, in the frame of increasing the share of the combinated transport, approved the **BILK** Complex Programme for the improvement of the Hungarian logistical service centre. The plan of the Budapest Intermodal Logistics Center dates back to the middle of 90's. In the background there's the environmental politics, which says, the most effective way to decrease the environmental pollution is to remove the truck traffic to the fringes of the city. The BILK combiterminal is about handling of accompanied and unaccompanied combined traffic in Budapest, in a modern logistic service centre. Main connections are to the ports in Hamburg. The planning and start up of a new and first bigger intermodal terminal in a country is a demanding task. A joint effort of different stakeholders and also a backup from government is needed in order to promote and speed up the start-up. The case of BILK shows that intermodal connections combined with a new terminal can bring up new business opportunities. BILK is an excellent benchmark for those countries where the intermodal transport is still in development phase.

The combined transport operations are still only a marginal part of railway operations in **Poland**. Transit position of Poland enables to join in the development of freight traffic in both east-west and north-south directions, thereby to stimulate development of rail and maritime connections. The port of Gdynia is a good example of an intermodal port hub development. The unitised traffic has increased very fast and totalled 460000 TEUs in 2006. Most of the units were containers. The number of swap bodies has been decreasing during the last years. The growth and concentration in container traffic gives better possibilities to develop intermodal solutions in Poland.

Key process, seen from the **Bulgaria**n transport policy point of view, is in integration of transport system of Bulgaria to the transport systems of the Member States of the European Union. Bulgaria will respond adequately to the increasing interest of foreign companies toward logistics market. Creating of intermodal terminals has been started. There are planned two intermodal terminals in the seaports Varna and Burgas - every with capacity of 500 000 TEU. The challenge for Bulgaria is the development path for successful intermodal development. National support policies are presented in PROMIT D5.1.

RailTrace is a working consignment and wagon tracking and tracing system operated over the Internet. The concept serves customer requirements for visibility in intermodal transports covering all modes. RailTrace is based on existing messages and no extra manual input or technical devises are needed. By receiving information about the incoming goods before the physical arrival of the goods railway companies may send pre-arrival notices to their customers, logistics service providers and other partners and this way better serve the whole logistic chain. Information received in advance reduces the turnaround time on the border crossing places, making it possible to allocate resources and pre-plan operations.

6.2.1 Europe – Asia connections

There are good perspectives for rail cargo in the transport to East. Some examples of the drivers are European congested ports, new terminals in East, investor's interests eastwards

and truck driver protection in EU. The competitive factor for rail transport is the end to end connectivity. In case there is a need for a maritime link in the transport chain, the competitive advantage is lost compared to direct maritime transport. This is also a barrier to the idea to collect volumes on regional basis e.g. in Scandinavian Countries. There is also space for new concepts and new routes (Korea, Vietnam).

Production is moving eastward as well as logistics service providers (LSPs) and distribution centres (DCs). Between China and Europe two container transfers between wagons are needed. Transport price defines the interests of logistics service providers. Price level compared to sea route is important. Some clear advantages of rail connection are the bigger container weights compared to maritime transport and faster transit time.

There are several rail corridors between Europe and Asia: TSR, Trans China and TRACECA. At the moment the capacity of TSR is about 1 million TEU /year. The traffic on TSR via Far-Eastern ports was 621 000 TEU in 2007. Most traffic is Russian import and export. The transit traffic has almost ended after the increase in prices. Reliability or uncertaintity of the TSR service (schedules) is one of the key barriers at the moment. There must be trust on the service. Tracing in TSR is working. Also security is good, no thefts have happened during last seven years. TSR is not competing with the sea route, it is more a supplementing service. Technical feasibility of TSR is in order and plans for improvement exist. Management of the corridors must be improved as well as more transparency is needed in order to attract customers. Service providers have to solve the question on how to bring in the volumes.

Working rail services between Europe and Asia exist. Far East Landbridge is offering the service between Asia and Central Europe. Polar Logistics is offering services between China and Finland. There are several rail services between Europe and Russia / Kazakstan.

Traffic is very unbalanced as 70% of the containers go empty from Europe to China. Development is needed on the areas of customs clearance, e-messaging, monitoring and control, schedules and timetables. Transit time is a very broad concept and calculated in many different ways. 14 days rail transport time can be 36 days for final customer. Russian customs is opening sealed transit containers which is against customs procedures. CCTT proposed a joint task force approach for the TSR development. All parties from the supply chain should participate to rebuild the transit business.

6.3 Recommendations

The next recommendation base on selected findings from the PROMIT D3.1 Best Practice year 1, D4.1 European benchmarks in intermodal transport and D5.1 & D5.2 Strategies and recommendations.

Business

Qualifications

Instead of trucks there are intermodal choices for many industries. Among the main barriers are the unreliability of intermodal choices and lack of services. Many big manufacturers have really started to look at the green choices. BASF and IKEA are examples of pio-

neers. New entrants are e.g. Volvo and Coca Cola. The main elements are organising the service needed for the company but also realise a back-up for the services.

New IT solutions are needed to manage the fluctuations and in order to obtain flexibility in the system.

For the intermodal solution it is important to have a steady transportation volume. Investments in equipment are high so the utilization level of the equipment must be high enough to make the undertaking profitable.

When switching to intermodal transport often initial losses are made. A critical success factor is the time required to start making profit.

Introduction of a new intermodal transport solution is a huge task and requires long implementing time, research, development, pilots and demonstrations. Big companies with resources are able to implement intermodal solutions. Potential companies should be motivated to think over and pilot innovative intermodal solutions.

Start up

In the new, developing transport corridors the start up of the services is a challenge. Especially in case there is no one or several source of significant freight flows. Here the formulation of the business model is of importance. Somebody must take the management of the business which is not self evident in existing supply chains management practices.

Three levels of transport

The PROMIT benchmark study has divided the intermodal transport into three levels; shippers´ level, logistics service provider level and operators´ level. The most important performance indicators, which are present on all three levels are cost/price, lead time, lead time variability, frequency of service, shipment compatibility and theft/damages. Often the indicators are cost of service, frequency and reliability. To measure the performance of an intermodal initiative it might be wise to look further than just the obvious indicators. In intermodal transport cases the indicators will be compared to single mode road transport. It is important to make them comparable with road shipments, thus increasing transparency and showing the advantages of intermodal transport. A good set of KPI´s is a sound basis for operational as well as strategic control of business.

Competition and collaboration

Competitive edge for an operator in European rail freight business covering several countries (infrastructure managers and railway undertakings) with interoperable technology and personnel is a key to success.

In case horizontal cooperation is needed, this increases the complexity of the business model a lot.

Vertical concepts are much easier realized because there are fewer conflicts of interests and gain and cost sharing is easier realized.

When expanding the current service, for instance by developing integrator services and outsourcing traction, relations change and with it interests and competition with customers or collaborators can arise.

IT solutions

The main key features of a successful IT solution are the modularity and expandability, allowing new services and applications to be integrated, open source approach and protected accesses and data. The actual implementation and performance of the IT systems do not depend merely on the systems' developed functions and applications but also on less obvious factors such as ICT acceptance by its potential users, a positive attitude towards collaboration rather than competition among the intermodal transport chain actors, aspects regarding access and privacy of information.

Policy

National support instruments

Many different types of national support measures were found in the first year PROMIT survey. EU should support national efforts. More detailed analysis of these instruments and evaluation of results is needed.

The Swiss and German policies show the power of national instruments. The question is the willingness of decision makers to support sustainable transport solutions. In Switzerland the focus is modal shift, in Germany support to intermodal terminals.

Both business as well as intermodal transport policy needs visions, more clear and measurable objectives and also tools for follow-up.

Inside the EU policy actions are needed to speed up the development of east-west intermodal preconditions. There are good results from Hungary which can be benchmarked for the other new member states. We recommend support actions for the main national intermodal hub or network of hubs, as well as support to intermodal rail / waterway connections to these hubs.

EU Asia rail connections

Direct rail connections between Europe and Asia are not a competing mode for maritime transport but more a complementary choice. These connections are a competition factor for the European industries. There exist several areas for development both on business as well as on administration levels. We recommend a bottleneck analysis of intermodal choices and a programme for further development. CCTT, Coordinating Council on Transsiberian Transportation proposed a joint task force approach for the TSR development. All parties from the supply chain should participate to rebuild the transit business.

City logistics

In many cities the waste is transported by trucks. Distances to dumping sites are growing as the places have to move farther from city centres. Rail and waterways can offer inter-

modal solutions, thus decreasing truck traffic. Both waterway (e.g. Cory) and rail systems working with boxes exist. Bigger cities should monitor their dumping place policy with a view to intermodal solutions.

IT integration

Development of interoperable information technology and systems is still at the initial phase and a huge potential lies in new solutions and their implementation. More public support is needed to boost the systems integration and user acceptance.

R&D funding

In many PROMIT case studies the whole project or a part of it has been partly funded by EU. The majority of the cases are framework programme funded projects. On the user/service provider side there is a strong demand for this funding instrument.

6.4 Next steps for PROMIT WP5

1. Collection and analysis of the third (last) year input from clusters. To find cases covering the areas which are not covered so far.
2. Collection and evaluation of findings for recommendations.
   - Further development of evaluation criteria.
   - A web based ThinkTank session among PROMIT Cluster leaders, WP leaders and Steering Committee members will be organised. GroupSystems ThinkTank is a computerised group decision support system, which can be used both in face-to-face workshops and Internet sessions to enhance the group productivity. Using computers connected via Internet, all participants of a workshop can simultaneously add information to a shared workspace, view other participants' inputs and comment them. The system enables also different methods of voting or polling with instant results. When everyone can contribute simultaneously, without having to ask and wait for the floor, the workshop time can be utilised efficiently. Also the more timid participants are uninhibited to share their views and predominant persons cannot control the discussion. In Internet based sessions, people may participate whenever they want, within a given timeframe, from wherever they want. All inputs are gathered into an automatically generated report.
3. Discussion of findings in order to present recommendations to the Steering Committee
4. Finalisation of PROMIT recommendations.

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