



Implementing Change in the European Railway System

Selected Findings from REORIENT

Intermodality

"a characteristic of a transport system that allows at least two different modes to be used in an integrated manner in door-to-door transport chain"



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Introduction

Two years ago, the REORIENT team of seven partners from Europe and the US received a mission from EC DG TREN. It was to assess the progress in implementation of the new rail legislation, and the impacts that this legislation had on the market behaviour of the European rail freight industry. Both the incumbent railway operators and the promising new rail start-ups were in the REORIENT analytical focus.

Not being satisfied with the existing patterns of railway service, the team explored how the new types of service could *really* come about in the liberalised market, and what triggered new entrants to enter and seize business opportunities offered by rail market opening.

Our work was interested in new businesses, and in operational changes implemented not only by the individual railway companies, but also in how the new structure of the railway market affected international freight logistics. That's why the REORIENT modelling experts explored this question in-depth through business simulation of new service concepts along the REORIENT corridor. These provide sea-land connections between the Nordic region and the countries in Central and South-eastern Europe.

The mission was challenging. It explored changes within the countries, and between them, in order to assess how the introduction of deregulated market governance was reconciling the needs for change with

The REORIENT rail freight corridor has verified market potential, and it is underused.

each nation's social, economic and political establishments and legacies. At the outset of the project, not much knowledge was available on the new Member States. Thus, the data collection was arduous and could only be accomplished with the help of sixteen subcontractors with excellent knowledge of their native countries.

However, the mission went further than assessing intra-country adjustments to new rail legislation. Since the future of rail freight transport lies in seamless and frequent service provision along international and/or trans-European corridors, it appeared necessary to assess factors that both hindered and fostered an uninterrupted flow of goods under intermodal freight transfer.

Whereas the initial efforts centred on infrastructure incompatibilities, speed profiles, sidings, etc., the second phase of REORIENT explored and assessed the reasons for border crossings delays, and their effects on total transit times, operations of terminals and transfer points, and also systemic divergences among the REORIENT Corridor countries.

Implementation of rail deregulation and the EU's interoperability directives require a lot of investments and technical innovations. The scope of financial resources for fulfilment of the directives' requirements is such that there is a need for support from politicians and the voting public. Both of these have been assessed by the REORIENT team.

Johanna Ludvigsen

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A changing global and European environment

New European transport policies, and EC-legislation for market opening and competition, are introduced in the midst of a changing world economy. These global changes also affect the structure of transport.

When we visited Polish operators we were anxious to explore whether new services were opened up towards the East. Due to improvements in the Russian economy, we expected that trade from Germany would be increasing. However, we learned that the opposite was true — revenues obtained from rail freight shipments linking Poland with Belorussia and the Ukraine were declining and the services were increasingly difficult to maintain. The reason is simple, cheap Chinese ore was being shipped in to Europe through Rotterdam. Such are the far reaching implications of the new global economy.

This section (the first section of REORIENT Selected Findings) describes the setting within which the REORIENT work has been undertaken, provides the research framework and gives illustrative findings.

Our focus of analysis is a rail freight corridor linking the Scandinavian countries with South-eastern Europe (Figure 1.1) .

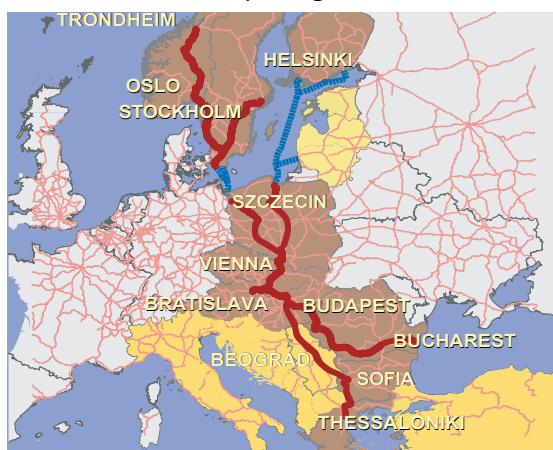


Figure 1.1: Outline of the REORIENT-explored international corridor

Europe has changed

It is important to bear in mind that the changes in the EC-legislation have been introduced at the same time that EU is expanding. Even during the project, the status of Romania and Bulgaria have changed, as they now are accepted as new Member States.

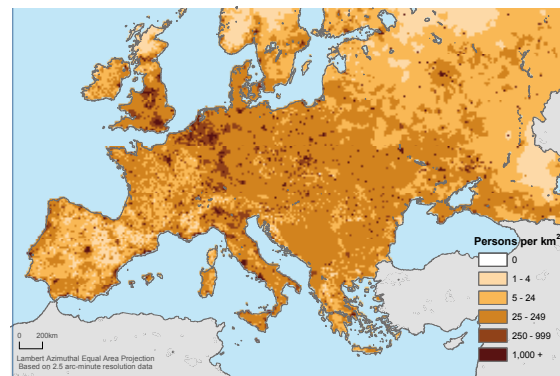


Figure 1.2: A population density diagram that illustrates the large number of citizens encompassed by the borders of the new Europe.

The enlargement of the European Community (EC) has as consequently led to geographical changes, and the centre of Europe has moved south-eastwards. More importantly the vast new expanses of land, and new opportunities created by the expansion increases the need for an infrastructure that serves the needs of the enlarged EC.

How to resolve the issues resulting from globalization, of market opening and reconcile these with country specific conditions and legacies of the past is one of the more pressing tasks facing the old and new Member States.

The REORIENT project has undertaken a range of surveys and analyses of these new beginnings, the changes in attitudes, and how stakeholders view the future. The following pages bring you selected findings from this effort.

Research framework — a layered approach

The research framework of REORIENT takes the external driving forces as premises for changes that would happen with or without EC-legislation. It distinguishes between changes brought about through the EC legislation and areas that, though they might be important, are not affected by the policies. The main focus is described by the four layers of Figure 1.3. It illustrates that EU railway directives are implemented into the national institutional and legal frameworks, resulting in market opening. This has consequences for the rail freight transport system with its links, terminals, border-crossings and rolling stock.

The vertical dimension is explored by means of country-studies, where the focus is on how each country adapts to the global economy, newly introduced EC-legislation, and the resulting market response. Findings from these analyses are presented in section two of this report. These factual studies are in section three followed by findings from additional studies of voter, local politician

and stakeholder support for trans-European rail freight solutions.

The relationship between the legislation and market behaviour is explored in section four. The horizontal dimension – the markets, the routes, border crossings, terminals and transfer points – are no less important. Analyses of the market opportunities within the REORIENT Corridor, and the service requirements that must be fulfilled to attract freight is analysed in section five. Moreover new service concepts are developed. In section five new business models are explored. Here, US-experience with respect to the driving forces for change in the rail freight industry has been important. That experience formed the basis for European studies contrasting the US scene with the changes in Europe. In section six, barriers to increased freight volumes are identified and the potential impact of barrier removal are assessed. Section seven describes an evaluation framework for studying the various impacts of new rail services and barrier reductions.



Figure 1.3: The conceptual framework for the REORIENT research programme

Dr Warren Walker led the work on assessing the status and progress of interoperability



Interoperability status and progress

One of the objectives of REORIENT was to assess the status of rail interoperability along the REORIENT Corridor. To this end, a wide range of information on a wide range of subjects was collected. The sources were:

- ◇ Existing European data sources
- ◇ Special data collection by country specialists
- ◇ Interviews with infrastructure managers, government officials, rail operators, union representatives, etc.

Subcontractors with special knowledge of the conditions in each of the Corridor countries were crucial for the success of this effort.

Interviews

The primary basis for the assessment of interoperability status and the most relevant implementation conditions was provided by a survey of the major actors in the railway system within each of the 11 countries along the REORIENT Corridor.

Different specific questions were asked of each of the various types of organizations surveyed:

- ◇ Infrastructure managers
- ◇ Railway undertakings (different questions for incumbent RUs and new entrants)
- ◇ Government institutions responsible for interoperability (different questions for the transport ministry, national competition authority, and national rail regulator);
- ◇ Intermodal terminal managers
- ◇ Railway unions.

2001/12/EC

Access rights for international freight services. Independence between RUs and IMs
Separation of accounts for passenger and freight operations. **Separation of transport operations** from capacity allocation, infrastructure charging, and licensing

2001/13/EC

Licensing of RUs

2001/14/EC

Allocation of railway infrastructure **capacity**
Levying of **charges** for the use of railway infrastructure. Safety **certification**

2001/16/EC

Technical Specifications for Interoperability (**TSIs**)

Quantitative analyses

To perform statistical analyses of the results, and facilitate comparisons among the countries on implementation status and implementation conditions, we assigned quantitative scores to the qualitative answers.

Terminology

The EU Directives (from the 1st and 2nd Railway Packages) specify *requirements* for achieving seamless rail freight transport. Deficiencies in meeting the requirements produce interoperability *problems*. *Implementation conditions* help facilitate the implementation of the requirements. *Implementation barriers* are shortcomings in implementation conditions that hinder meeting the requirements.

Interoperability requirements

Requirements to achieve seamless rail freight transport include all necessary conditions related to the institutional/legal framework, the market system, and the physical railway system, presumed by the EC (in its Directives) to lead to seamless rail freight transport. For example, Directive 2001/12/EC, relating to market opening and integration, requires the separation in railway undertakings' financial accounts of freight and passenger activities. We distinguished requirements within the following eight categories:

LF: legal/institutional framework regarding the freight railway system
 IA: interoperability and accessibility procedures
 MO: market opening and market conditions
 TI: technical interoperability according to TSIs
 NL: network links
 TP: terminals and transfer points
 BC: border crossings
 RS: rolling stock

Generally, scores for the requirements are higher (i.e., the requirements are met better) in the Nordic countries (Norway, Sweden, Finland) and lower in new Member States and Greece. Interactive thematic maps are available on the REORIENT project Website that allow exploration of these results. For a quick overview of the scores assigned to any or all of the 46 requirement aspects based on the survey results, click on the following link, and choose the requirement aspect you want to see in the drop-down menu at the bottom of the map:

https://www.reorient.org.uk/content/map/Requirement_aspects.

The figures on the following page display the results for two of the requirements. The table on this page presents a summary of the results across the eleven countries along the REORIENT Corridor for each of the eight categories of interoperability requirements. Overall, it is clear that there is considerable variation in interoperability status across the countries. However, excluding the category "Technical interoperability according to TSI's", it appears that practically all countries are doing a reasonable job of complying with the requirements of the Directives. (There has been no substantial progress in TSI implementation in any country so far.)

Table 2.1 Requirement aspects

Requirement Aspect Category	Ade-quate	Less Ad-equate	Not Ad-equate	Severe Limita-tions	Total
Legal/ institutional framework	6	4	1	0	11
Interoperability and accessibility procedures	5	4	1	1	11
Market opening and market conditions	2	5	3	1	11
Network links	2	9	0	0	11
Terminals and transfer points	4	5	1	1	11
Border crossings	4	6	1	0	11
Rolling stock	3	7	1	0	11
Technical interoperability according to TSI's	0	0	5	6	11
Average number of countries (exclusive of TSI's)	3.7	5.7	1.2	0.4	11

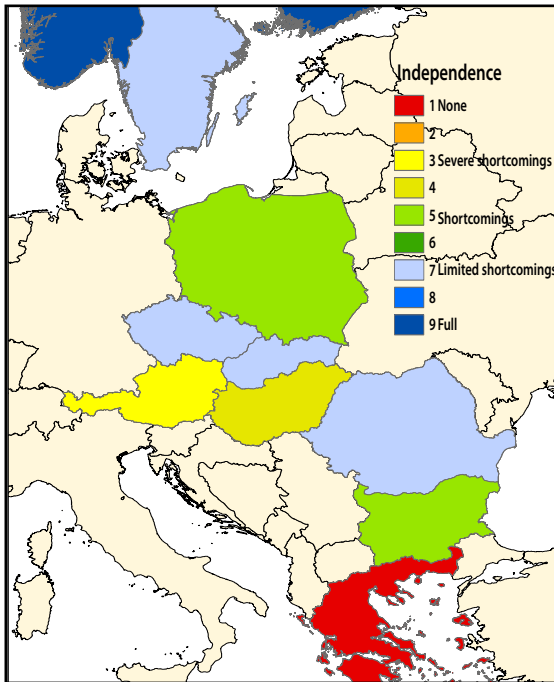


Figure 2.1: Thematic map for independence between rail infrastructure and operations

Independence

Figure 2.1 is the thematic map for the requirement that the country's Infrastructure Manager be completely independent of all of the country's railway undertakings. It shows that, for this requirement, Norway and Finland had the highest score, and Greece had the lowest. There were also severe shortcomings in Austria, while Sweden, the Czech Republic, Slovakia, and Romania had only limited shortcomings.

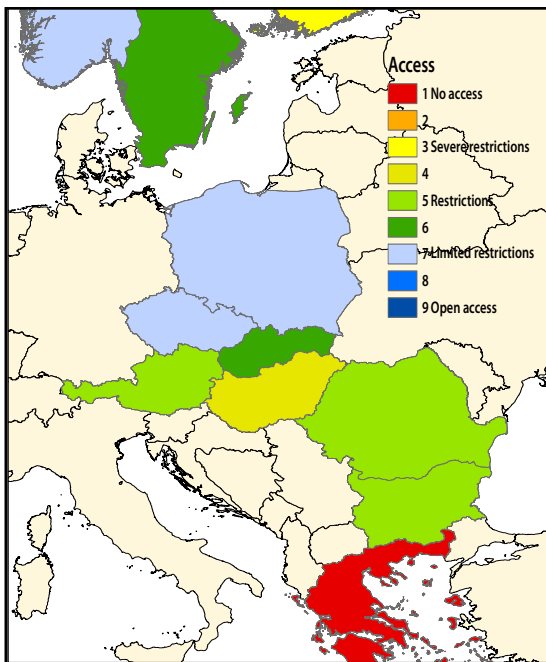


Figure 2.2: Thematic map for non-discriminative access

Access

Figure 2.2 is the thematic map for the requirement that there should be non-discriminatory access for all freight railway undertakings to the Trans European Rail Freight Network (TERFN). It shows a somewhat different pattern from that for the independence of the Infrastructure Manager. No countries had full open access. Each country had some conditions that were unfavorable for new entrants. The best performing countries in this case were Norway, Poland, and the Czech Republic. Greece currently provides no access for new entrants. Some severe limitations also exist in Finland and Hungary, although for different reasons.

Implementation conditions and barriers

We distinguished implementation conditions/barriers within the following seven categories:

- P: Political conditions/barriers.
- A: Administrative conditions/barriers.
- S: Social/cultural conditions/barriers.
- T: Technical conditions/barriers.
- F: Conditions/barriers related to the financial perspective.
- M: Conditions/barriers related to the market perspective.
- I: Institutional & organizational conditions/barriers.

Within most of the categories, we also made a distinction between the ability to carry out a function (the degree to which a condition is present and/or available), and the interest in carrying it out (the degree to which the attitudes, objectives, or behavior of specific actors would support or resist the creation of a required condition).

The table below presents a summary of the results across the eleven countries along the REORIENT Corridor for the two subcategories (ability and interest) for each of the seven categories of interoperability requirements.

Overall, in terms of ability, the implementation conditions are generally less than adequate. (On average, the abilities are adequate in an average of only about 4 of the 11 countries.) However, there are severe limitations in very few cases. The biggest barrier to implementing the EU's interoperability Directives is clearly financial.

With respect to the subcategory interest we used a different scale to define the scores. We rated a country's interest as favorable, neutral, or unfavorable. In most countries and most categories, we found the interest in implementing the Directives to be neutral. However, there do appear to be some strong social/cultural barriers to implementation in many countries.

Table 2.2: Ability and interest in carrying out a function

	Ability				Interest		
	Ade-quate	Less Ade-quate	Not Ade-quate	Severe limita-tions	Fa-vour-able	Neu-tral	Unfa-vour-able
P: Political	5	5	1		2	7	2
A: Administrative	4	6	1		2	8	1
S: Social/cultural	na	na	na	na	1	5	5
T: Technical	2	8	1		0	10	1
F: Financial	3	3	2	3	1	8	2
M: Market	5	5	1		0	9	2
I: Inst. & organizational	4	4	1	1	3	7	1

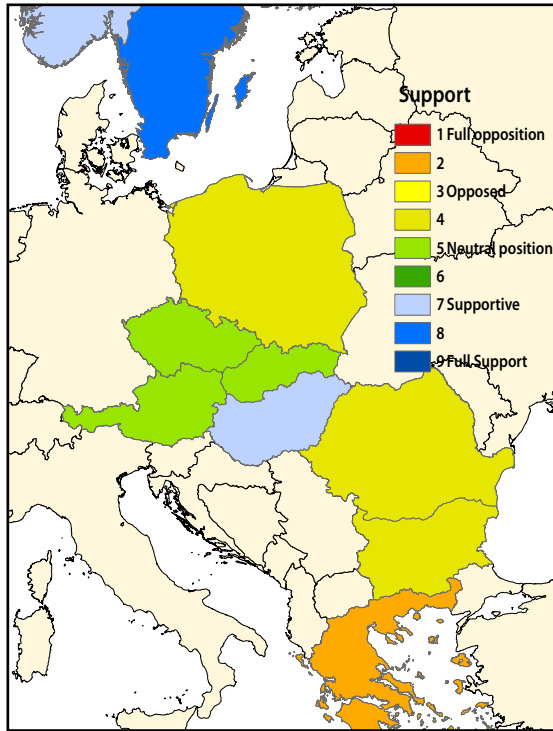


Figure 2.3 Thematic map for willingness to implement administrative changes

Support

Figure 2.3 is a thematic map showing the results for the implementation condition “Willingness of the National Rail Regulator to Implement Administrative Changes”, which falls into the subcategory “Administrative” within the category “Interest”. It shows that there is strong support in the Nordic countries and in Hungary for implementing the necessary administrative changes, while there is some degree of opposition in Bulgaria, Romania, and Greece.

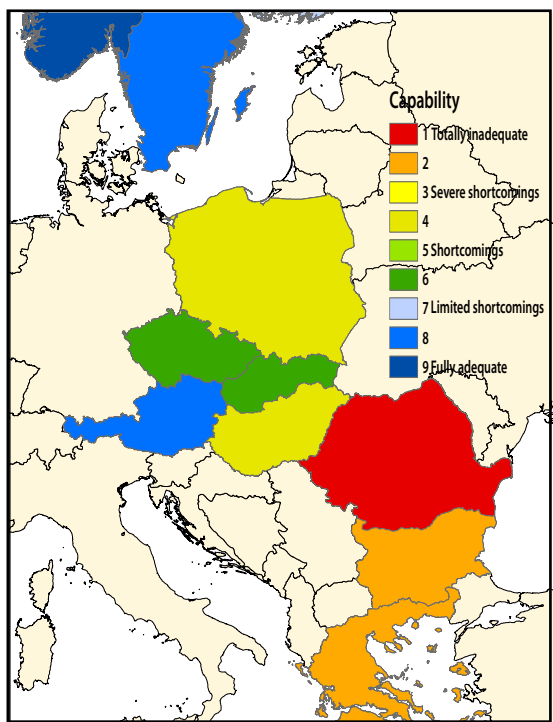


Figure 2.4: Thematic map capability to support investments

Capability

Figure 2.4 is a thematic map showing the results for the implementation condition “Government. Potential to Support Investments”, which falls into the subcategory “Financial” within the category “Ability”.

It shows that there are significant financial barriers to achieving the goals of interoperable international rail freight transport in Romania, Bulgaria, and Greece. No such barriers exist in the Nordic countries or Austria.

Relationships between requirements and implementation conditions

Although there was considerable variation in the status of interoperability across the eleven countries along the REORIENT Corridor on practically all of the interoperability requirements, there was also considerable variation in the status of the implementation conditions across the countries. As a result, we found that most of the variability

in status was able to be explained by relationships that were found to exist between the requirements and the implementation conditions. (In fact, we were able to explain almost 90% of the variability in the requirement scores among the countries by the associated differences in scores in the interoperability conditions among the countries.)



Non-electrified shunting yard. Photo: Dr. Elise Miller-Hooks



Unloading of long-haulage trucks. Photo: Dr. Elise Miller-Hooks

The relationships between implementation conditions and the requirements in the first three requirement categories are quite different from the relationships between implementation conditions and the requirements in the categories related to the transport network. In the former case, success in meeting the requirements was closely linked to political, administrative, and market conditions in the country. In the latter case, financial conditions were much more relevant.

These results are good news in terms of understanding the underlying problems in achieving seamless international rail freight transport. They provide us new insights into these problems. However, it is bad news with respect to solving the problems, in the sense that they suggest that changing the current status of the related conditions may require major changes in a country's economic, political, cultural, educational, etc. situation (i.e., not only EU Directives).

CONCLUSIONS

- ◇ The factors explaining the status of meeting the legal/institutional, procedural, and market requirements (LF, IA, MO) are significantly different from those explaining the status of the network-related requirements (NL, TP, BC)
- ◇ Considering only the LF, IA, and MO requirements, the main barriers to meeting the requirements relate to: Inadequate mandates and lack of willingness of national regulators to implement and enforce administrative changes.
- ◇ Inadequate organizational structures, skills and knowledge of rail institutions (railway undertakings, infrastructure managers, and regulators) to handle changes in task execution.
- ◇ Lack of potential and willingness of RUs and IMs to adjust to changed market structures.
- ◇ If only the requirements related to the transport network are taken into account, financial barriers are dominant. The main financial barriers are the potential of both the railway sector and the national government to accommodate required investments and the willingness of the railway sector to invest in technological improvements and new business concepts.
- ◇ Other barriers for improving the transport network are inadequate organizational structures, skills and knowledge of rail institutions, and technical barriers.

The research program on socio-political support for rail freight was led by:
Dr. Ronny Klæboe
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Is rail freight still popular in Central Europe?

Financial barriers are a major factor hindering the rapid adaptation of new Trans-European rail freight solutions. They are substantial and cannot be handled by the rail freight and logistic industry alone. Support for rail among the voting public and local politicians is thus critical for securing national and regional corridor development.

Rail freight has a stronger position, and handles a much larger share of rail freight volumes in the REORIENT Corridor countries than in West-European EC-countries. But this does not necessarily mean that rail also enjoys popular support.

The opening up to a market economy could mean that the voting public and politicians are anxious to adopt West-European solutions, abandoning rail and instead adopting long haulage freight solutions.

That such worries are not unfounded is evident from the Polish government transport planning document that shows that between 2007 and 2013, Poland will receive about 19 billion € from Union funds for "Improvement of Infrastructure and Natural Environment". 11 billion € will be channelled to building new highways, whereas 4.8 billion € – less than half – will go to railways.

What is then the current level of social support for rail freight solutions? Data were scarce, especially for the new Member States and candidate countries. Language problems exacerbated the problems. A conceptual framework for organising the input was also missing-- which factors facilitate social support for rail and which factors can be conceived as hindrances? The REORIENT team developed their own survey instruments to answer these questions.

REORIENT ten-country voter study

Encompasses 2429 interviews among voters and local politicians in 10 cities along the REORIENT Corridor, and 10 cities outside the corridor. Adopting a social dilemma approach, the questionnaire contained 57 questions. The questionnaire was translated and back-translated to ensure that the questions were perceived the same way in all countries. The telephone survey was undertaken by a marketing company, and the results from each country checked by subcontractors for each country to ensure that the results were plausible.

Social dilemma approach

The current situation of European freight transport by road is a social dilemma, since gratification of one group (i.e. those in need of freight transport) has adverse consequences (e.g. traffic congestion, accidents, noise and pollution) for a larger group of people. Using national resources for balancing freight transport between road and rail is also a social dilemma, since adverse consequences for one group (i.e. those wishing to spend national funds for an alternative purpose) deter them from contributing to

producing benefits to a larger group (e.g. a more healthy environment for all Europeans).

Based on prior research on social dilemmas, we will measure the *Importance assigned to rail freight transport vs. roads, crime prevention, and education etc.* *Social orientation* (i.e. preference for common benefits over own individual benefits). *Environmental risk perception*. Perception of traffic congestion, accidents, noise and environmental pollution as local, national and European problems. We also analyse local, country and European identity.

Views of voting population and local politicians

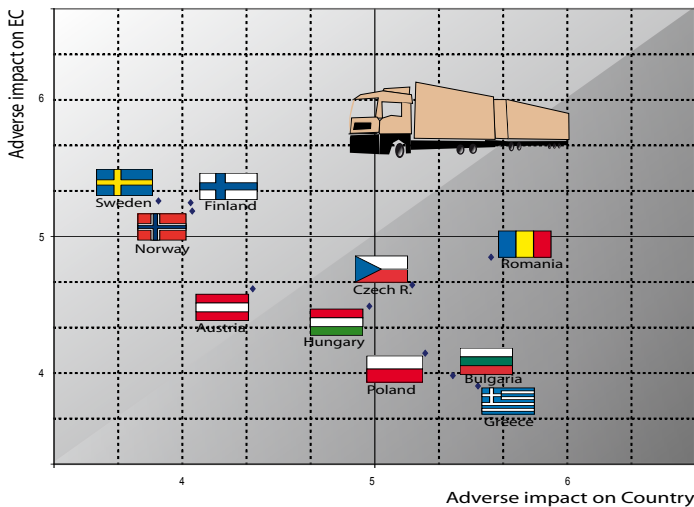


Figure 3.1: Perceived adverse impact (accidents, noise, pollution, congestion) of road traffic on EC by level of impact on country

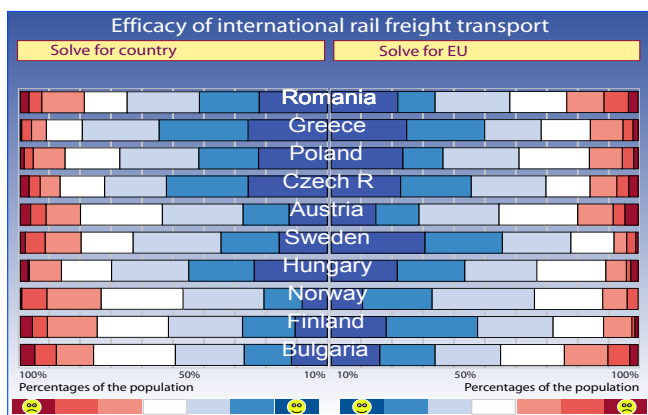


Figure 3.2: Perceived efficacy of rail for reducing road related problems (accidents, noise, congestion, and pollution).

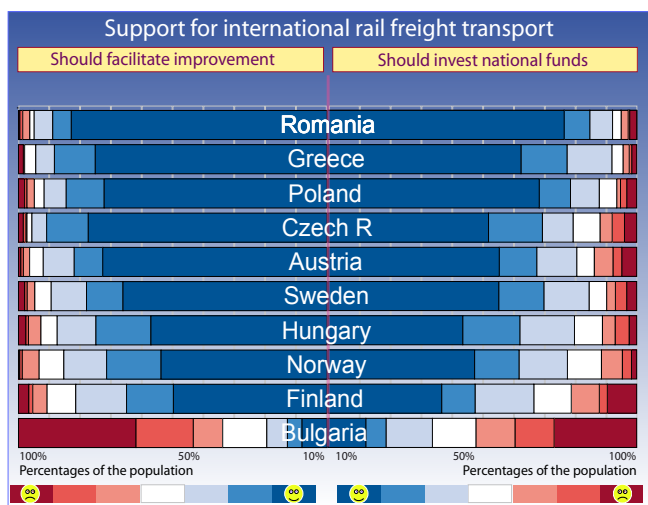


Figure 3.3: Popular support for international rail freight solutions.

Greece, Romania, Bulgaria, Poland, Czech Republic and Hungary are the countries perceiving road traffic related problems to be worst. Scandinavian countries perceive road traffic to have a relatively smaller adverse impact on their country, whereas they perceive road traffic problems to be serious in the EC. With the possible advent of Giga-liners one can expect that this will be even more true.

The first condition for popular support for rail – that noise, pollution, congestion and accidents associated with long haulage truck freight loads is perceived to be a serious problem is thus fulfilled.

However, support for rail is not only dependent on externalities of long haulage road freight, but also on the perceived efficacy of rail to solve these problems.

From the illustration to the left, where blue tints signify strong support, white indifference and red lack of support, it can be seen that rail is generally also believed to provide a solution for these problems, either in their own country or for the EC as a whole. **The second condition** that must be fulfilled for popular support for rail can thus to a large extent be seen to be fulfilled in all REORIENT corridor countries.

International rail freight has thus a strong standing in all REORIENT Corridor countries -- See Figure 3.3. On a scale from one to seven, sixes and sevens are the most popular scores. A positive stance towards new Trans-European solutions as shown by the Romanian voters can help support the increases in rail transport from Turkey and the Black Sea via Constanza through Romania to West and North Europe. The strong support for rail in REORIENT Corridor countries is important social capital for rail and logistic freight industry operators, and for national groups wishing to promote rail solutions.

Explanatory factors for social support



Figure 3.4: Passenger train passengers willingness to wait extra and/or endure a longer trip to facilitate international rail freight transport.

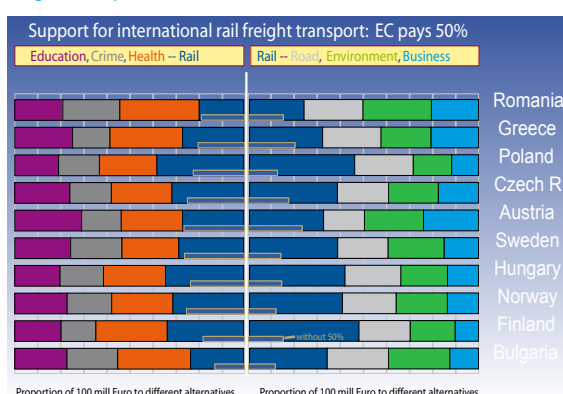


Figure 3.5 Support for international rail freight solutions with, and without EC 50% contribution (silhouettes within blue area).

What are the most important factors explaining support?

Results from a multivariate regression analysis show that the perceived environmental risk from long haulage freight traffic on roads, is not as important for social support as the overall positive perceived effect of rail freight on county and country as well as the efficacy of rail to solve such problems. When Bulgaria is included in the analyses, a strong local identity is a factor reducing social support for rail; when excluded, a strong European identity is shown as having the most important positive impact -- see Table 3.1.

We find that in the more important countries with respect to a rail freight service on the North to South-East Axis of Europe, Poland, Czech Republic and Hungary, rail passengers are both willing to endure a longer trip and longer waiting times in order to facilitate international rail freight. Whereas one should be careful not to put too much emphasis on statements, the results nevertheless signal a voter willingness to support EC-policies with respect to rail freight. Romania, Greece, Poland, and Hungary are quite favourable whereas Bulgaria together with Norway are less positive – see Figure 3.4.

Financing intermodal rail freight solutions poses a social dilemma in that other national sectors receive less. When asked how to apportion 100 mill €, rail freight still receives substantial support, but it is clear that in countries such as Romania having other pressing exigencies, rail receives a smaller share than in countries where health care, education and crime is seen as less of a problem. From Figure 3.5 it is also clear it is primarily when rail freight solutions compete against less critical policy areas, that a contribution from the EC would bolster popular support for rail.

Table 3.1: Factors explaining support for rail.

Explanatory factor	Facilitate	Help fund
Overall effect in county (Q27)	.11**	.09*
Overall effect in nation (Q28)	.15***	.17***
Environmental risk from road(Q30)	.15***	.15***
Efficacy of rail (Q32)	.17***	.12***
European identity (Q47)	.06**	.09***



Conclusions on social support

Model for social support

Neither utility theories nor politically motivated models for social support provide much help with respect to providing a conceptual basis for assessing social support for rail.

Our results show that international rail freight solutions receive support from people that see long haulage trucking as causing adverse environmental effects **if** they also perceive rail to have a beneficial impact and **if** they do not have other priorities.

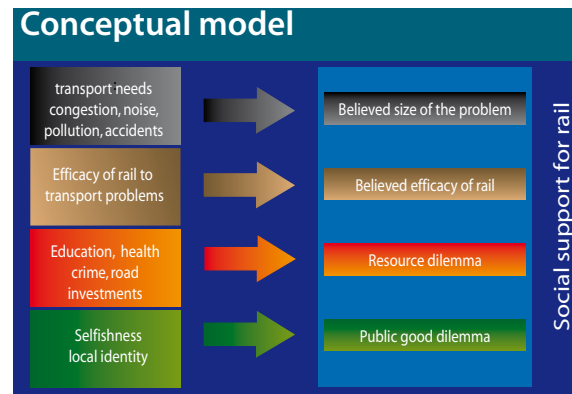


Figure 3.6: The conceptual model of support for rail freight in the REORIENT ten-country study on public support

Where road transport is not perceived to be a large environmental problem, support for rail may still be gained **if** rail freight solutions are promoted as a solution to the adverse impacts from long haulage trucking in West Europe.

What is the value of this research for the rail industry, logistic operators, national governments and the EC?

1. We have developed a conceptual framework for assessing social support for rail that works.
2. We have produced quality assured questionnaires, with necessary translation and back-translation.
3. We have undertaken a ten-country survey that has assessed country similarities and differences with respect to city population support for rail.
4. We have provided specific recommendations for the rail industry and logistic industry on how to utilise the results.

REORIENT POLICY RECOMMENDATION:

Intermodal rail freight divisions of CER and UICC should use the survey results to mobilise popular support for rail freight using media and other channels. They should emphasize rail's ability to solve problems and the improvement potential of rail, more than the fact that long haulage truck transport causes problems. They should promote European identity building in the area of transport. In the Scandinavian countries they should emphasize rail freight transport's ability to solve EC-problems in West Europe more than those in the Scandinavian countries. When rail is not competing against health, education, crime prevention and other highly prioritised areas, the EC and national governments will find it easier to obtain social support for intermodal rail freight solutions when these are seen as a package deal where the EC (and/or other countries contribute) along trans-European Corridors.

Saving nature or saving the economy?

That was the question posed by the International Herald Tribune in an article covering the recent accession of Bulgaria to the EC.

They reported on demonstrations by property developers and other stakeholder groups fighting against EC environmental legislation.

That it is the special protected areas that may cause international freight transport the biggest conflicts is also evident from the sharp conflict over a Polish motorway project through an important marshland area: The Porsuda valley –



Photo from Porsuda valley by Tomasz Daniecki

THE INDEPENDENT *"On one side of the argument there are eagles, wolves and orchids; on the other side there are endless heavy lorries and burgeoning economic growth. Welcome to Europe's new environmental battleground."* Michael McCarthy 15.3.2007

From political discourses and at rail conferences, representatives from the new Member States argue that in their countries the definition of the Natura2000 areas precede important infrastructure development projects. The legislation has therefore more profound adverse impacts on infrastructure development than for countries where infrastructure was already well established.

Time aspects are also important. Those affected by the legislation argue that whereas environmental legislation was introduced over many years in the West European Member States, the new Member States are required to meet the legislation overnight.

However, it is also possible to argue that after infrastructure projects are already decided it is more difficult to find good solutions.

Rail freight is less in conflict with Natura2000 areas

REORIENT results show that rail solutions along a North-South Corridor are considerably less in conflict with EC special protected areas than long haulage truck transport. No serious conflicts were reported. This is due to the extensive rail network that already is in place and that is underutilised. That rail overall is the more environmentally friendly solution is well known. However, our study also shows that with respect to potential conflict areas, rail is in a much better position than road along the business corridor from North to South.



REORIENT research on Natura2000 areas

Since potential conflicts on environmental issues can be disruptive to rail services, the REORIENT team decided to supplement the overall evaluation of the environmental

impacts of rail freight solutions with a dedicated small study on potential local sensitive areas with respect to noise and Natura2000 areas along the business corridor.

Research objectives - Identify:

- Possible nature or noise conflict areas along the business freight corridor from Szczecin over Poznan and Gdansk over Ostrava to Vienna that could cause interruption of services
- Vulnerable nature protection areas and problems in densely populated urban areas (noise, dangerous goods)
- Legislative requirements that could hamper the realisation and operation of the REORIENT business corridor

The work on localized conflict areas supplements the more general evaluation on average impacts of rail.

Transfer point sensitive areas

Even though rail is the more environmentally friendly solution, conflict may occur.

These will most likely be concentrated at transport access or **transfer points**, such as the harbour of Swinoujscie (Poland).

The area in the park and around the Szczecin Lagoon is designed as a Natura2000 Special protection area (SPA) and nominated as a national Site of Community Importance (SCI).



<http://natura2000.mos.gov.pl/natura2000/>

Figure 3.7: Map of the Natura2000 areas around the harbour of Swinoujscie

REORIENT noise and Natura2000 area results:

- ❑ Supplementary freight volumes along the business corridor will not lead to noticeable new negative regional and local effects
- ❑ Negative impacts from freight operations are likely to occur in terminal areas - not line stretches. This is especially true in the case of terminal expansion activities, but also with respect to terminal noise and local freight distribution traffic.
- ❑ Operators should be aware of nature protection issues with respect to Woliński national park/ Szczecin Lagoon and 10 other designated or proposed Natura2000 areas
- ❑ Infrastructure Manager activities might cause disruption of services

REORIENT RECOMMENDATIONS: New road infrastructure through important nature areas should not be heavily subsidized. National governments should assist rail freight and train operators in securing hub terminal areas that are less in conflict with noise and nature. Operators need be aware of potential conflicts due to maintenance activities.

Stakeholders' views on the new railway policies more positive than expected

One reason for the more positive perceptions of rail freight along the North South REORIENT Corridor is that many of the railway unions in East and Central Europe were part of the opposition. This was especially true in Poland, where the Solidarity movement became internationally famous. Since opposition was coupled with a wish for reform, and an opening up to market liberalisation, trade unions in Central Europe have been more positive to reform. In fact, the position of the trade unions in central Europe has been more likened to their role in the US rather than in Germany and France.



French, Belgian and Dutch union workers have forcefully opposed the liberalisation of the harbours. From the REORIENT interviews there is little evidence of any strong opposition to new rail services on a North–South corridor. Photo AFP.

REORIENT Stakeholder survey results

- Trade unions are more sceptical, whereas new rail undertakings (RU) place more importance on access rights. IMs and incumbent RUs are more worried than others about financing. In all groups, technical harmonisation in border-crossing transports gains major support.
- The interviews suggest that respondents from “peripheral islands”, i.e. Finland and Greece, do not see many benefits from implementation, while Bulgaria and Romania are more optimistic.
- There might be a loss of synergy between infrastructure and operations (especially pointed to by trade unions, but also other stakeholders). Neutral capacity allocation is seen as crucial for fair competition, especially by new RUs.
- About two thirds of the respondents expect that the EU railway legislation will contribute to solving major obstacles in achieving seamless freight transport. However, solving the problems will take a long time. The efficacy and results of the national implementation of the interoperability legislation is crucial.
- Safety : On one hand, there is fear that competition presses costs down which in turn may negatively affect safety. Many of the interviewed trade unions and a few IMs and RUs share this concern. On the other hand, there are elements of the legislation that are expected to promote safety. The latter argument is supported by more than half of the respondents from IMs and RUs as well as a few trade unions.
- There is limited experience with the effects of EU railway legislation on working hours and wages. Stakeholders felt it premature to draw conclusions .
- Two important conditions for rail freight transport go beyond the scope of the directives:
 - the trends underlying freight demand
 - conditions within road transport.

The results from the REORIENT interviews indicate there is *no lack of stakeholder support that would hamper implementation of railway directives along the REORIENT Corridor.*



Social dialogue and the pedagogical challenge

How can social support be increased/enhanced?

To improve support for rail reforms, both distributional and pedagogical challenges must be met. The distributional aspect is the problem of a redundant work force. Depending on labour market and state policies, downsizing the number employed may, - at least in a short term perspective - carry substantial negative social costs that have to be handled.

The pedagogical challenge is how to attain the change in mentality among stakeholders, business and administrative players, that will enable the rail freight industry to provide an improved service and become more competitive.

At the start of the REORIENT project we thought that a country's capacity to absorb and retrain workers would be the most important factor explaining the speed and smoothness of rail reforms. According to such a theory, countries like Norway and Austria should be better off than countries such as Bulgaria and the Czech Republic. An alternative theory was that the quality of social dialogue would be the determinant. According to such an argument, Norway and the Czech Republic would come out on top. REORIENT results provide more support for the latter explanation -- social dialogue may thus be the more important explanatory factor.

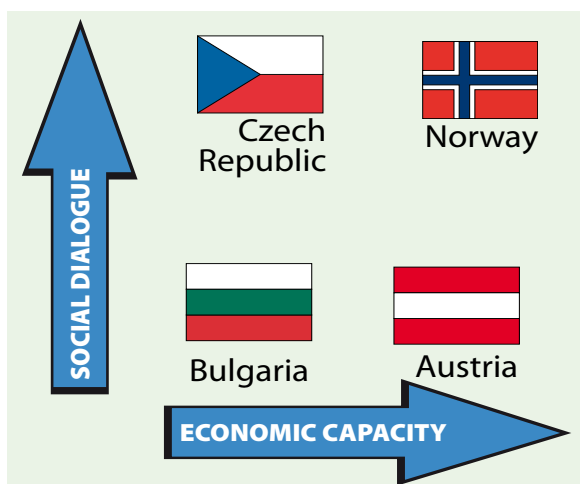


Figure 3: What explains the smoothness of rail legislation implementation: economic capacity or quality of social dialogue?

Making the transition from public utility to rail freight business is not easy. As expressed by a top manager of the Norwegian incumbent rail freight company -- it would never have been possible if the rail union workers had not participated in the transition. This is easy to understand, since the whole terminal structure was streamlined in a clear decisive manner. The types of services, number of rail employees and range of worker competences needed within the company was altered.

It must be kept in mind that the transition in the Nordic countries came well before EC-legislation. The restructuring was implemented over a longer time period, making it easier to adapt.

Participation of all stakeholders in discussions at a sector level can increase the understanding of the need for reforms, the content of the reforms and ways of implementing and refining the legislation. New RU's should be included in discussions by law where applicable. However, facilitation of social dialogue must be country specific. Whereas tripartite and bipartite negotiations are subject to formal regulations in some countries, it is tradition and mutual confidence between the parties that is the basis for dialogue in others.



No clear relationship between deregulation and market dynamics

Inter-country variability in rail market deregulation and emergence of intra-modal and inter-modal competition gives rise to important policy-effectiveness questions. Rail deregulation directives envisioned that intra-rail rivalry would improve the railways' competitiveness versus road, and over time, transfer freight volumes that today are carried by road to rail. However, the up-to-now-implementation outcomes have diverged substantially from these intentions because no clear relationship between completeness of market deregulation and the types of competition could be observed. Operators in some countries established strong intermodal competition without, however intra-sector rivalry. Some others developed fierce intra-rail rivalry despite incomplete market deregulation and without venturing into rail-road contests. The latter did not bring about any diversion of freight volumes from road to rail.

The figures juxtapose differences between the REORIENT Corridor countries as regards the completeness of market deregulation and occurrence of intra-modal and intermodal competition. Both Figures 4.1 and 4.2 suggest that Poland and Romania developed intra-rail competition without completing rail market deregulation.

		Deregulated Market Governance	
		Complete	Incomplete
Intra-rail competition	Yes		Poland, Bulgaria, Romania,
	No	Norway, Finland, Sweden	Hungary

Figure 4.1: Deregulation and competition

Norway, Sweden and Finland on the other hand did not embark on intra-rail contest despite almost complete rail deregulation. Neither Hungary nor Greece managed to complete rail deregulation, and both are devoid of intra-modal competition.

		Road - rail competition	
		Yes	No
Intra-rail competition	Yes		Poland, Bulgaria, Romania,
	No	Norway, Finland, Sweden	Hungary Greece

Figure 4.2: Competition matrix

Poland

- ◇ 60-150 percent annual growth in new entrants' freight service
- ◇ PKP Cargo and PKP PLK in considerable financial difficulties
- ◇ Governmental and European subsidies to PKP and PKP PLK
- ◇ Seriously deteriorating national rail network
- ◇ Large investments in road-building
- ◇ No investments in rail network

Hungary

- ◇ Non-existent intra-modal competition
- ◇ Market dominance of MAV Cargo
- ◇ MAV Cargo's shuttle trains compete marginally with road
- ◇ Government and European subsidies to MAV Cargo and MAV Infrastructure
- ◇ Large investments in road building
- ◇ Some investments in rail network envisioned in the future

New rail entrepreneurs indicated that before expanding into the road freight sector they had to learn how to compete with incumbents and that time was needed to build their own financial solidity because investment capital for private rail business expansion was not available. Knowledge of the business expansion cycle shows that rail-road rivalry may be contingent on:

1. Adequate scope of managerial knowledge required for risk-taking arising from domain enlargement
2. Access to capital needed for expansion of production assets, and
3. Sufficient stock of own financial reserves from operations profitability.

For the new rail ventures, this requires:

- ◇ Good knowledge of service quality required by shippers of high-value cargo
- ◇ Possession of flatcars for transfer of intermodal load carrying units (containers, swap-bodies and semi-trailers)
- ◇ Large amounts of cash for in-house financing of capacity expansion, and/or issuance of secured equity or bonds for inflow to external capital, all needed in concert and, accompanied by good timing.

The above experience provided inputs to time-paced business expansion trajectory that outlines developments from small rail start-ups controlled by professional owners,

via publicly quoted large turnover companies to international corporations with networks of subsidiaries and/or joint ventures in various national markets.

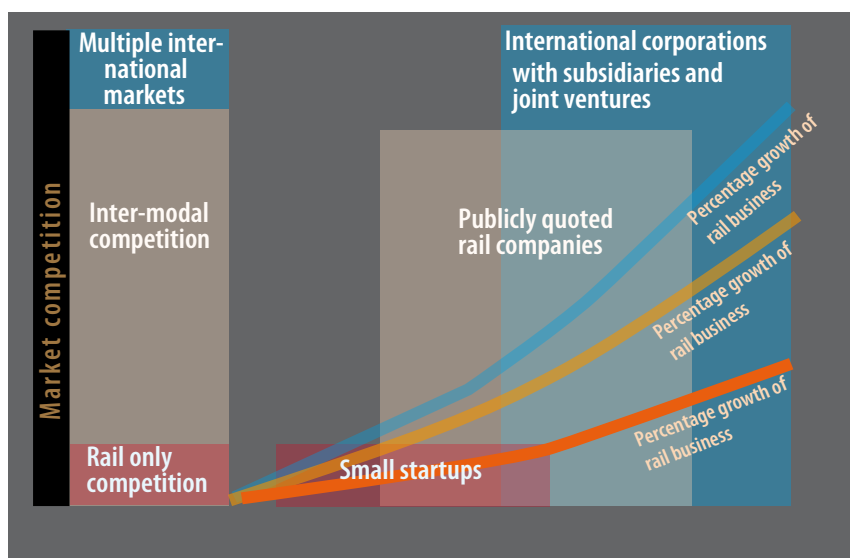


Figure 4.3: Three business growth trajectories

The three business growth trajectories reflect the rail market environments with different qualities of deregulated market, growth opportunities and availability of internal and external investment capital, which together affect managerial decisions on expansion into new business segments. These strategic behaviours point to an imminent emergence of rail-road competition.

RECOMMENDATIONS:

- 1) More intra-rail competition between national and international rail freight operators will increase intermodal rivalry.
- 2) Opening of rail market for financial capital inflow from private investors will increase service quality, and chances for intermodal rivalry.
- 3) Unification of rail infrastructure charges along trans-European corridors will increase operational profitability and application of ICT solutions for enhanced rail competitiveness.

Dr. Arild Vold was in charge of assessing the market potential of the REORIENT Corridor, essential factors for attracting freight to rail, and the business case.



Market opportunities in Central Europe

Potential market for new rail services in the Corridor

Analysis of current freight flows from a variety of EC and international data sources and expected growth based on EC research project models were supplemented with REORIENT survey results of flows in the new Member States. The research results indicate that a new rail service could attract a considerable amount of freight from road to rail-based solutions:

- ◇ There is a significant intra-corridor trade.
- ◇ REORIENT countries trade with other REORIENT countries comprise up to 13% and a minimum of 4%.
- ◇ An imbalance in the directional goods flows could have posed a challenge for new services. But this imbalance is in the process of being evened out both in relative and absolute terms.
- ◇ In addition to attracting flows from road haulage, the new services will also draw rail freight volumes from competing corridors in Germany. Since these today carry the major freight volumes North-South, this again will have a positive secondary effect of transferring more of the West European freight flows from road to rail.
- ◇ The fact that a proper rail service is missing in the REORIENT Corridor provides good opportunities for new services to exploit the potential.
- ◇ The resulting availability and improved service quality in the REORIENT Corridor may increase the share of high value general cargo for rail based services.



Figure 4.1: Rail-based shipment routes (blue lines) coincide with the TEN-T intermodal priority axes (colours). REORIENT shipper survey



Figure 4.2: Shipper survey respondents' description of routes for truck-only shipment (blue curves). Out of the 421 shipment routes described by shipper survey respondents, we found that 296 were truck-only.

Master of Science Berit Grue was in charge of the subtask on shippers' quality requirements.



Shippers' quality requirements

The REORIENT team developed, carried out, and used information from a survey among freight shippers located in the REORIENT Corridor to identify international shipment routes (Figure 4.1-4.2), shipment types and the difference in quality of service provision versus shippers' quality requirements for truck-only and rail-based transport. It was also to identify shippers' underlying determinants for choice among available transport solutions.

1. Rail shipments are big and primarily shipped by big shippers (Figure 4.3)
2. Manufactured goods (general cargo) is the major commodity group in the market for intermodal service (Figure 4.4).
3. The numerous small shippers have a relatively low rail share
4. Rail-based transport is cheaper than truck for the major commodity groups. Considerable shipment size and market power is commonly a prerequisite to bargain for competitive prices.
5. We found specifically that reliability, transit time, type of goods (e.g., hazardous versus non-hazardous, high-value versus low value) are the most important determinants for mode choice. As the value of the shipment increases, the shipper will be less sensitive to the price of shipping the good.

Large shippers use more rail

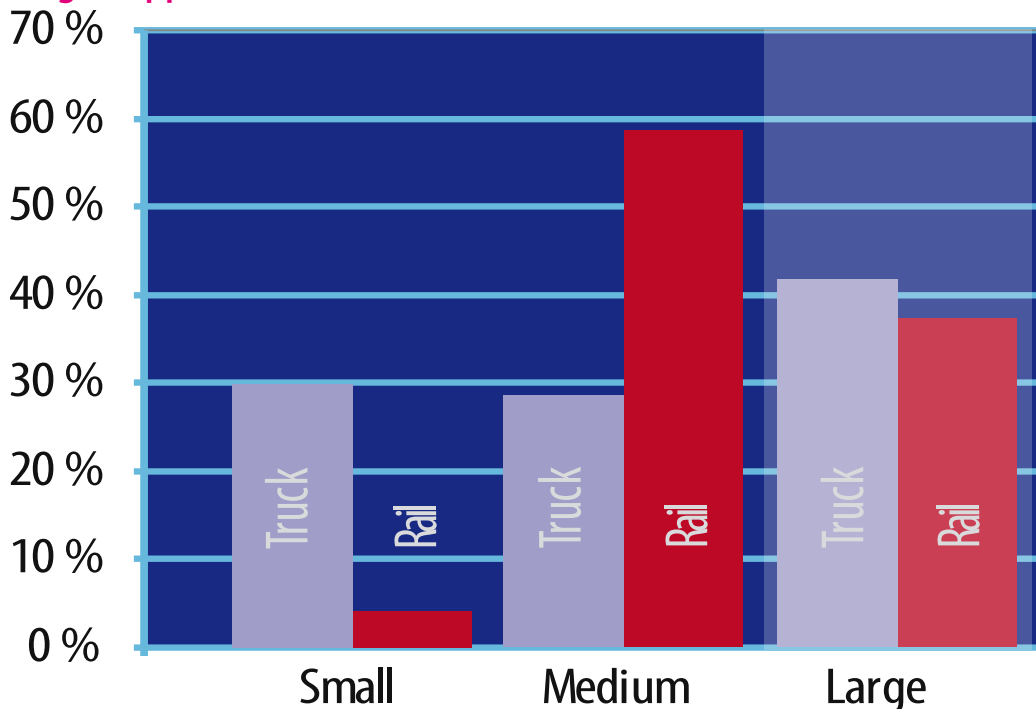


Figure 4.3: Road and rail shipments weighted by freight volumes shipped yearly by interviewed shippers. For truck the mean shipment weight is 18 tonnes, whereas for rail it is 346 tonnes. REORIENT shipper survey

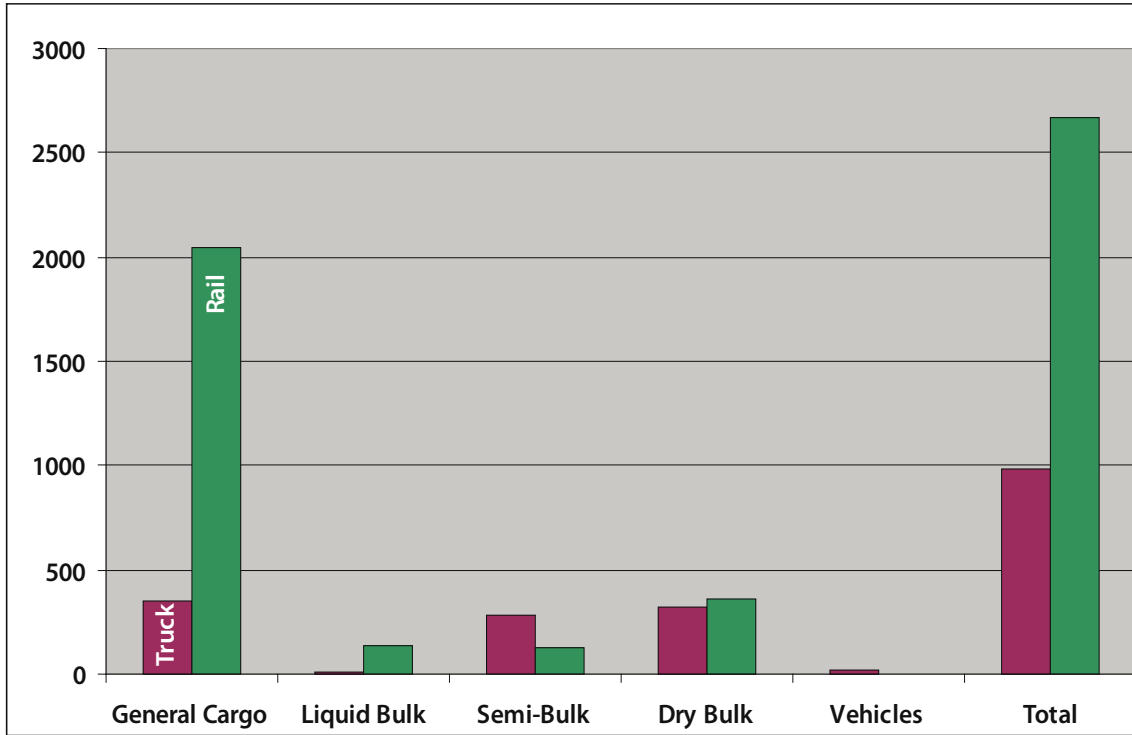


Figure 4.4: Total yearly shipment volumes on truck and rail by shippers in the WP6.1 shippers' survey. By main cargo group (1000 tonnes)

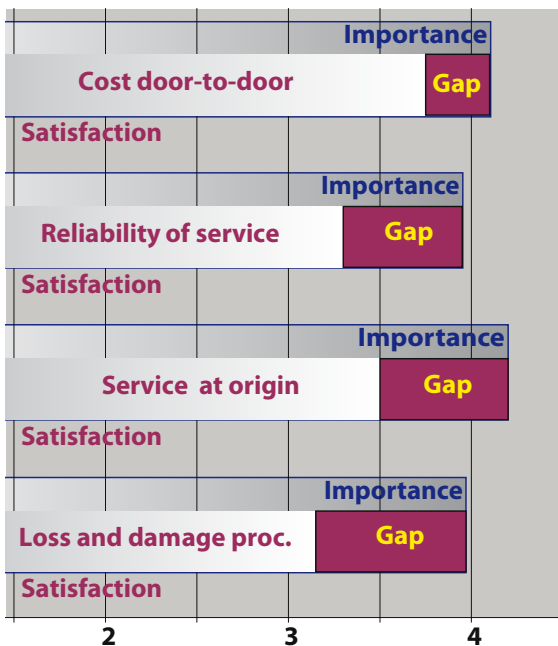


Figure 4.5: Satisfaction-Importance gaps for rail freight

Satisfaction – importance gaps

Results from the REORIENT shipper survey confirmed the importance of certain quality factors. Essentially, the quality factors with high importance are the same for rail users and truck users, but with a slightly different ranking. The REORIENT shipper survey also contains shippers' evaluation of satisfaction. For rail users we found that highly ranked factors with a big gap between ranked importance and actual satisfaction comprise:

1. cost-of-door-to-door delivery
2. processing of loss and damage
3. transit time
4. reliability and service availability at origin point (Figure 4.5).

Gaps were overall considerably smaller for truck-only users.

Essential factors for increasing rail-share

REORIENT has identified manufactured goods (general cargo) as the major commodity group in the market for rail intermodal services, and also deduced essential factors that would stimulate shippers in this market to increase their share of rail-based shipments and also attract shippers that are currently truck-only. The big shippers are particularly important, as these already have a large rail share, and have the potential of increasing this share even further.

The overall higher value of goods conveyed by trucks implies that greater competitive interface for rail may capture more high value goods. Although shippers are willing to pay more for transport of high value goods, competitive prices are still crucial, because price is a strong determinant for mode

choice in cases where several transport solutions satisfy the shipper's quality requirements.

Companies that do not consider rail transport may have threshold requirements on the level of certain elements of transport quality. This threshold is higher than the level of quality provided by the available rail services.

The big gap between importance and satisfaction implies that marginal improvement in rail transport quality may easily satisfy the minimum standards required by segments that today use truck-only transport. This may attract new customers from road to rail. But current rail customers may change from rail to other modes in case the quality deteriorates. We found that mode-shifts are particularly sensitive to changes in reliability and transit time.

REORIENT RECOMMENDATIONS:

The competitiveness of rail is at the edge. Rail shares are more sensitive to changes in the quality of transport than road. Change processes are also self-reinforcing. This suggests that measures to improve rail need to be implemented quickly, to give them a better chance of succeeding. Improved rail transport quality may quickly exceed critical levels for attracting a greater segment of shippers' freight needs.

The EC and national governments should encourage a market structure with several large shippers. These have the competence, access to equipment and wagons allowing a larger share of the shipments to go by rail. We are here only considering rail share.

Reducing entry costs for small companies by providing them access to flat cars for transporting their semi-trailers, can reduce the number of truck-only shippers.

Logistic Service Providers should be stimulated to manage medium and small shippers' small shipments by offering cost effective rail-based consolidation/bulk breaking logistic services

There is a market for new rails services along the REORIENT Corridor, and that investors should consider the proposed services developed and evaluated within the REORIENT Project

REORIENT Corridor service alternatives

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.

This creates a window of opportunity. The REORIENT consortium has consequently identified market opportunities for improved rail-based services within a corridor from the Nordic countries to South Eastern Europe (Figure 4.7).

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.

We have 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:

1. **Swinoujscie-Bratislava/Vienna-Budapest:** Full Container Load (FCL) block train dedicated to movement of paper rolls to mills.
2. **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.
3. **Gdansk/Gdynia-Bratislava/Vienna-Budapest-Beograd-Thessalonica:** Mixed Container on Flat Car (CFC) and SFC shuttle train.
4. **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 4.7 The REORIENT Corridors from Scandinavia through Central Europe and via Vienna to Constanza in Romania and to Thessaloniki in Greece.

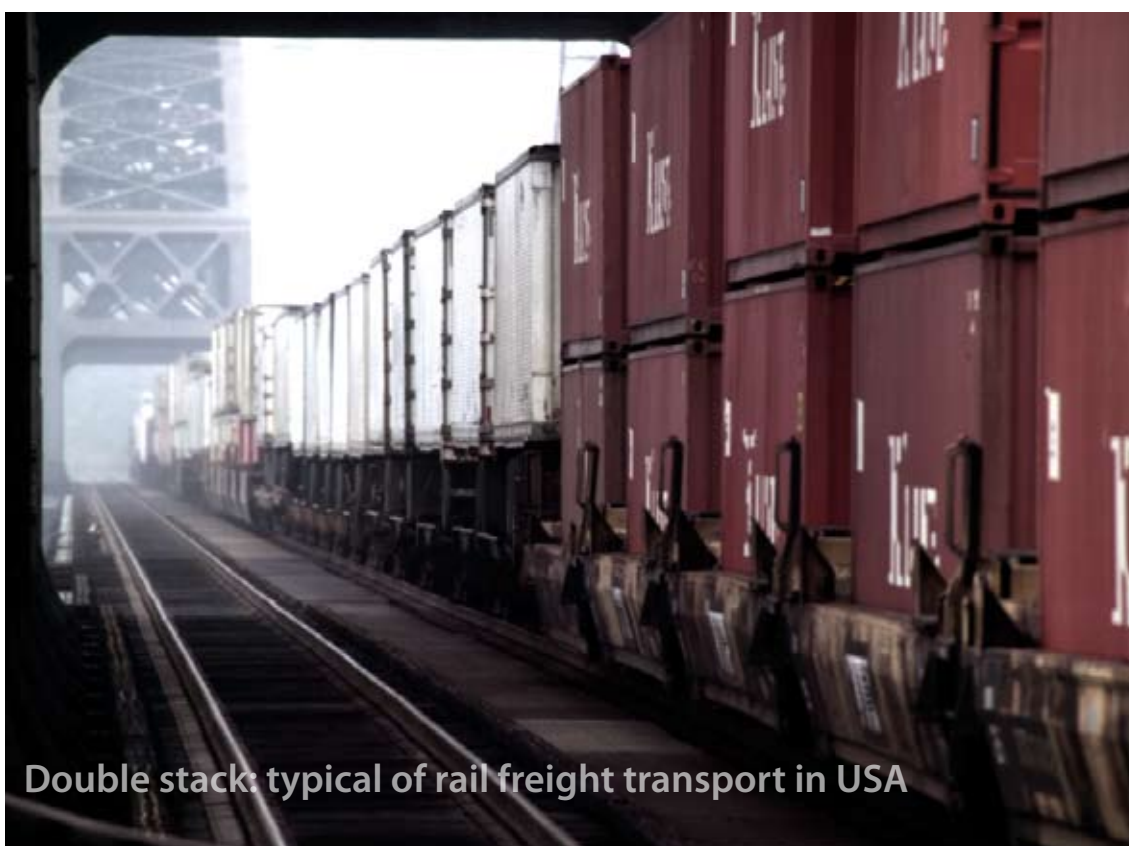
New services need to incorporate the attributes and properties that give rails a competitive advantage. Most importantly, new services need to reduce the *service requirement* -- *service satisfaction* gap.

This is the gap between what customers want from logistic operators, and their satisfaction with the level of service provided. If these gaps can be reduced, rail can gain large volumes of new freight. Section six of this report analyses the impact of improvement in the service quality as a result of barrier reduction strategies, and how various alternatives fare under different conditions. They indicate that a modest reduction in barriers can produce good results.

US rail intermodal experiences

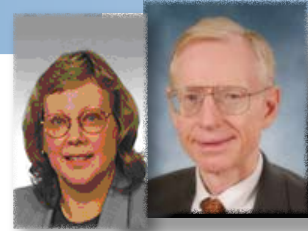
Rail intermodal traffic in the U.S. has grown from 6.2 million containers and trailers in 1990 to 11.7 million in 2005. The US success is due to deregulation that opened a growing market for freight transport for intermodal services because of globalization and changes in trade flows. From the 1990s, the shipper and carrier sides of transportation have adjusted to the new environment and the benefits of deregulation have been realized. New technologies made it possible to provide competitive rail-based services that expedite big volumes of freight on a limited number of routes. A variety of types of companies – intermodal marketing companies, ocean carriers, trucking companies, or small package express carriers – became the retailers of intermodal rail freight, allowing rail-

roads to continue their role as wholesalers of intermodal rail freight. Third party operators in US rail freight business are often referred to as IMOCs – intermodal operating companies - or intermodal marketing companies, IMCs. It is characteristic that forwarders are usually brokers that sub-contract extensively, which is different from Europe, where the industry is characterised by horizontal logistics and the vertically integrated nature of many of Europe's leading providers. In Europe the deregulation process started later than in the US, and this process is still going on as EU expansion continues. A main difference is the private sector vertically integrated ownership structure in the US and the mixed separate ownership of infrastructure and rail operating companies.



Double stack, typical of rail freight transport in USA

Dr. Evelyn Thomchick and Dr. John Spychalski provided insights from the US intermodal market and business models.



Ten assessment criteria for investors

For a potential investor in new rail services, it is important to understand where cost and value is generated in the transport chain. Each participant should earn a rate of return sufficient to attract and retain the amount of capital that is needed to provide freight transport service commensurate with market demand. We used knowledge of successful US business models and current European models to conceptualise a framework for how business and management models evolve (Figure 5.1). It depends on the market for rail-based services and the interplay between several actors that overall changes the business environment and utilization of enhanced the technology. To assess the ten investment criteria, we analysed the market potential based on official statistics, and carried out a survey and model analyses.

The conceptual framework was utilised as a foundation for development of ten investment criteria. These identify the potential for success of a rail freight company's ability to attract capital. They were derived from conversations with railway officials, information published in reputable rail trade periodicals, and railway company reports.

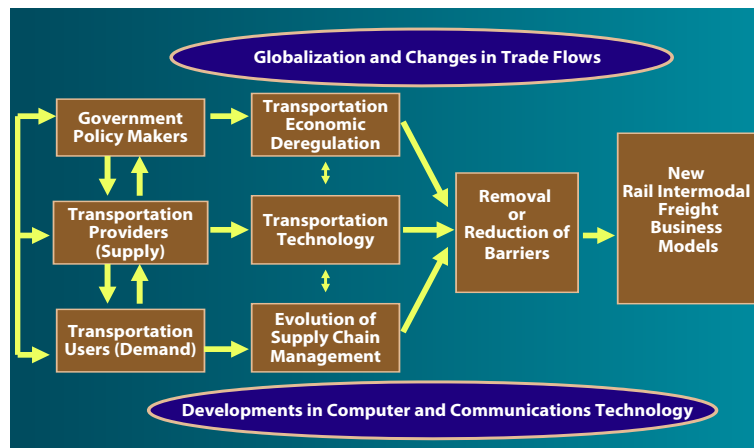


Figure 5.2: Conceptual framework of rail intermodal business drivers

1. **High probability of achieving an acceptable risk-return relationship.** Over the years since deregulation in the U.S. freight railway industry, railway companies have, in general, been relatively risk-averse in choosing among capital investment opportunities.

Investments involving entry into new markets requiring large-scale additions to the railway asset base have been subjected to a much higher minimum rate of return requirement than capital investments undertaken for the purpose of reducing operating costs.
2. **Estimated traffic and revenue—their level, consistency, and duration.** Entry into new markets requiring substantial initial capital investment has typically been undertaken only in circumstances where there is a relatively high probability that the traffic and revenue estimated to be obtained through such investment will continue throughout the expected life cycles of the invested assets.
3. **Scale of the corridor market**—are estimated traffic and revenue levels sufficient to support the number of rail freight service providers permitted to operate in the corridor?

4. **Network effects** – are individual corridors complementary to one another, and what is the connectivity of rail operations and rail service marketing between complementary corridors?
5. **Balance of traffic flows** – what is the opportunity for achieving a relatively high level of balance between movements of loaded containers and rail wagons in the front-haul direction vs. the back-haul direction?
6. **Nature of rolling stock requirements** – specialized service designs vs. general service designs. (Investment in rolling stock required for new railway business ventures can be undertaken with lower risk and hence lower minimum rate of return requirements when the rolling stock required for such ventures can be readily redeployed in other markets if the ventures for which the rolling stock was initially acquired fails to meet expectations.)
7. **Infrastructure geometry, track quality, and track and bridge axle-load capability** – will the infrastructure support train operations at the speed, train length, and locomotive and wagon weight limits required to meet the demands of freight shippers while also keeping costs of operation at affordable levels?
8. **Provision of management information systems, processes, and technology sufficient to support both the internal rail management functions and external railway customer service and marketing processes.**
9. **Setting of priorities for use of rail line and terminal capacity** – that is, establishment of criteria for determining preference for use of track and terminal capacity as between trains serving the several distinct categories of rail freight service (e.g., relatively fast intermodal freight trains, freight trains catering to wagonload and small multiple wagonload consignments, and block or trainload movements of bulk commodities, such as coal, grain, and iron ore).
- 10 **Retention of existing infrastructure and vacant rail-owned real estate**, presently either underutilized or unutilized, to accommodate possible future growth in traffic flows at levels in excess of the capacity of in-service or active track. (Some U.S. railways have moved relatively quickly to divest lines that have lost all traffic, or are still active but are not considered to be adequately profitable.)

Business model alternatives

REORIENT developed business and management models for various service concept. 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:

1. acquire information about operators opinions on the type of business model appropriate for the REORIENT Corridor.
2. identify operators interested in investing in the REORIENT shuttle services and making use of the services.

Survey data were collected in nine corridor countries: Norway, Finland, Poland, Czech Republic, Austria, Hungary, Bulgaria, Romania and Greece.

Respondents were characterised by their size and type of business, i.e., manufacturing (20), export/import/wholesale (12), 3PL (13), 4PL (4), transport (20) and other (2). Respondents were asked to evaluate four archetypical business models (Figure 5.2). Each of these four different models suggests a different insight of the leader in the corridor.

Models 1 and 4 are considered realistic business models for the REORIENT service concept. (Table 5.1. Most respondents chose model 1 for the starting model, and listed model 4 as their next one.

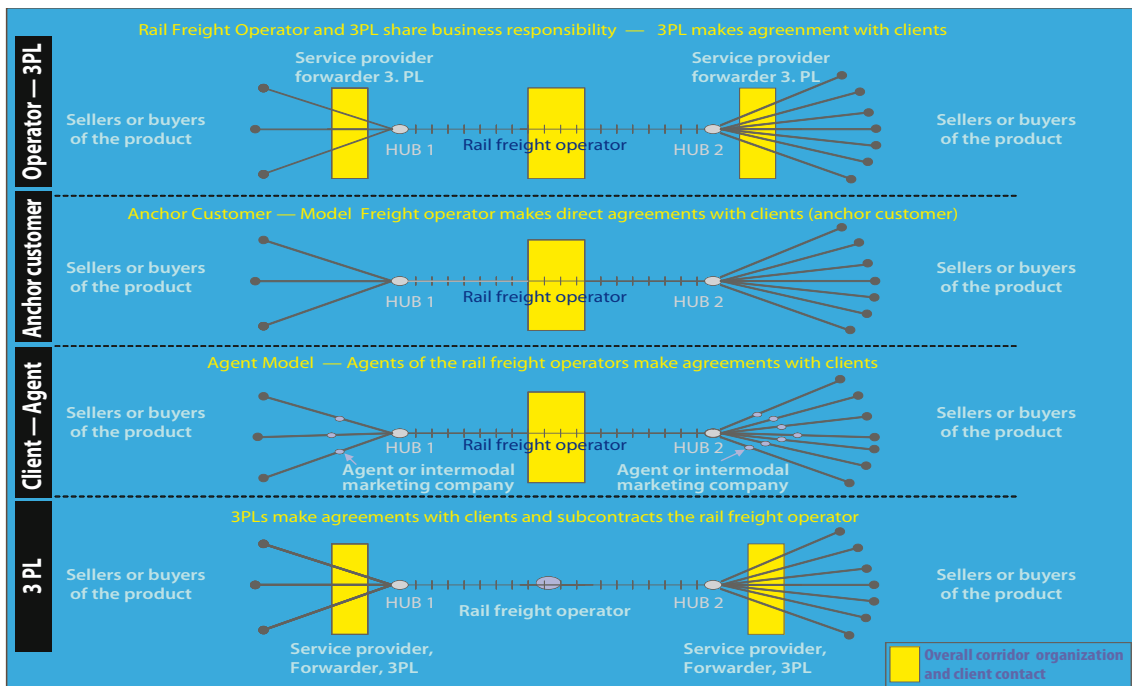


Figure 5.2: Different types of service models

After five years, the support for the 4th model as main 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 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 are 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 execution 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.

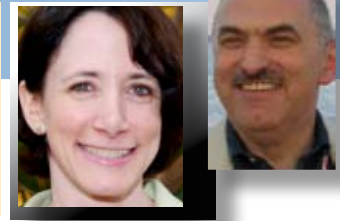
A majority of the 71 business units belong to big companies (company turnover > €100 million). The importance of the markets is apparent from answers to questions of *What would encourage you to invest in new business ventures in the REORIENT countries:* Almost 50% selected market size and scope, whereas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

Table 5.1 Business models considered realistic by different market players

	Manuf	Exp	3PL	4PL	Tr.con	Other	Sum
Operator – 3PL	11	7	9	2	12	2	43
Anchor customer	4	2	2	0	3	1	12
Client – Agent	5	3	4	1	7	0	20
3 PL	7	3	7	2	9	1	29

*Dr. Elise Miller Hook and
Dr. Hani Mahmassani are in charge
of the barrier analysis and modelling of
service alternatives in
REORIENT*



Barriers and countermeasures

ADMINISTRATIVE:

Still too much red tape in various countries; navigable, but not seamless. Information not widely available; varies considerably by country, but nobody is perfect.

SOLUTION: Time, meetings, trust, joint efforts, high-level emphasis.

TECHNOLOGY:

Infrastructure quality uneven, especially in new Member States, resulting in slower speeds. Analysis of higher speed scenarios suggest greater potential market share for rail.

Intermodal still hampered by terminal processing times due to technological limitations.

SOLUTION: Encourage investment in technology, with public-private venturing, especially in the early stages as services take hold in the REORIENT Corridor countries.

MANAGEMENT PRACTICES:

While nominally open, current slot allocation processes reflect biases that hamper the ability of new entrants to provide new intermodal rail-based freight services. Existing processes partly inefficient and not freight-friendly.

SOLUTION: Introduce and promote collaborative management and decision-making framework and practices for slot allocation and reallocation in real-time to optimize the overall performance of the system.

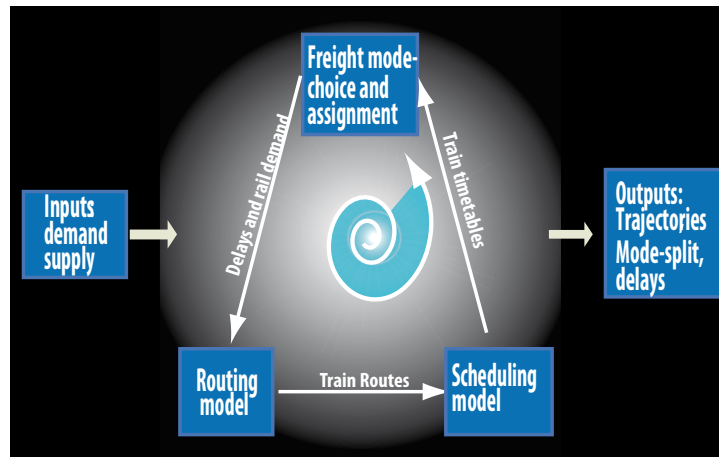
POLITICAL:

Rail freight does not receive sufficiently high visibility on the national or European agendas. As such, improvements are left primarily to administrative processes that move slowly and are largely dominated by national rail undertakings.

SOLUTION: Find political champions with understanding of economic significance of logistics processes and awareness of social attitudes towards green technologies and processes.

Multimodal network modeling

A core component of the REORIENT methodological toolkit is an integrated platform that supports evaluation of strategic and operational decisions. It consists of three main inter-related components: Freight simulator with mode choice and assignment, service route design model, and scheduling model (Fig. 6.1)



Two broad types of scenarios were evaluated using this platform for the REORIENT Corridor:

Figure 6.1: Integrated evaluation model supporting strategic and operational decisions.

Service design scenarios, in terms of introduction of new services (Figure 6.2).

Operational scenarios pertaining to border crossing times and intermodal transfer rates.

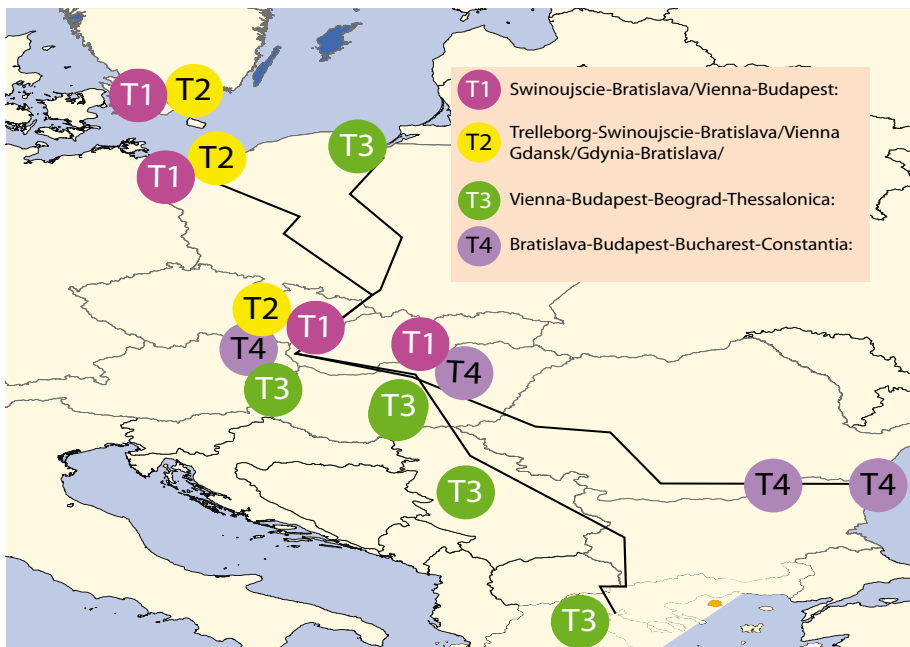


Figure 6.2 Map showing the various service alternatives.

The analyses demonstrated the importance of network effect: the sum is greater than the parts. Deploying all four proposed services results in capturing greater share of demand for intermodal rail than the sum of demand for each service deployed separately – See figures on page 34 for the impacts of single and combined measures.

Highlights from service scenario analyses

Scenarios with additional loading points along the corridor result in a greater number of attracted shipments (Figure 6.3):

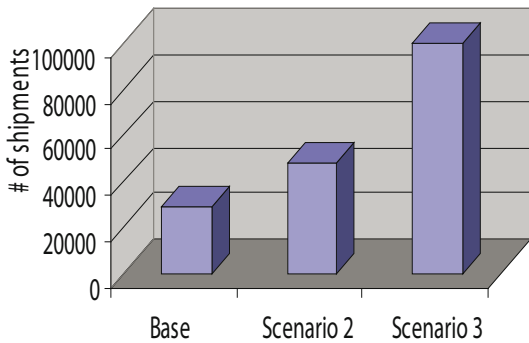


Figure 6.3: Scenarios with additional loading points.

Technical barrier analysis

Improving border crossing times results in a significant increase in the demand captured by the new services (Fig. 6.4):

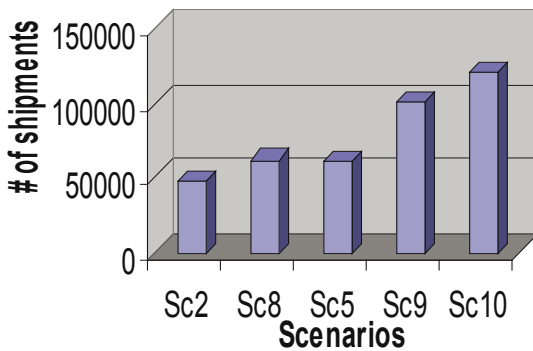


Figure 6.4: Scenarios with shorter border crossing times.

Putting it all together

When new services are introduced, with a sufficient number of service access points (intermodal terminals), technological and administrative barriers correspondingly mitigated (resulting in higher speeds on certain track segments and less delay at border crossings), modern technologies introduced (resulting in greater safety and faster terminal processing times), a significant impact can be noted on the market share of rail-

based intermodal services in the REORIENT Corridor (Figure 6.5). The magnitude of gain is estimated between 15 % and 20 % in the REORIENT Corridor study area

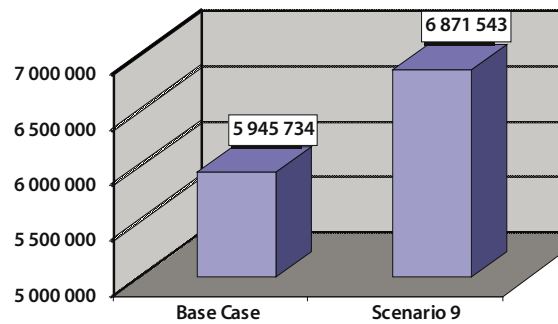


Figure 6.5: Scenarios with combined measures.

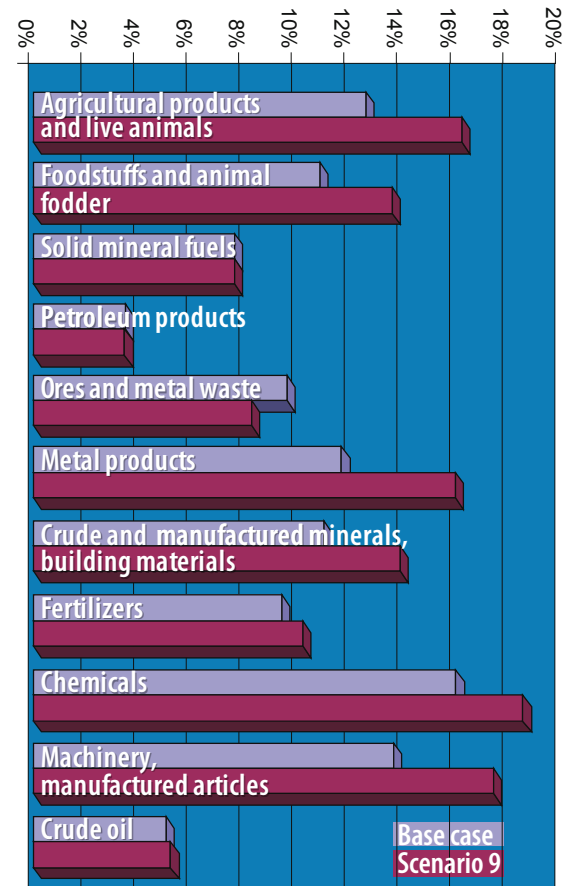


Figure 6.6 Rail-based intermodal shares for unitized goods. Significant gains in market share for shipment of unitized goods are noted in nearly every commodity classification



Economic, social and environmental benefits

Positive and negative effects that come along with freight transport are often unequally distributed among stakeholders. While the transport sector gains and employment opportunities improve, the population living along transport corridors suffer from a high risk of accidents, noise and exhaust emissions.

The research addressed the question: how decision makers assess transport strategies concerning economic, societal and environmental impacts in a straightforward way? A set of tools was developed that allows the assessment of internal and external effects.

Internal effects, which emerge for involved transport companies and shippers from decreasing transport time and costs, are analysed using a generalised transport cost approach. It reveals that the proposed solutions are competitive transport solutions compared to long distance road haulage. Moreover, external effects – those effects which bear on the whole society and the

environment – were studied. The suggested methodology comprises the quantification and monetization of socio-economic impacts as e.g. the risk of accidents or noise and exhaust emissions. For those aspects where the spatial distribution is relevant, as for instance for noise and or danger caused by goods transported, a down-to-earth approach with GIS was developed using the European-wide available data sources CORINE and CIESIN (Figure 7.1). The method was applied for the comparison of the proposed shuttle trains against long distance road transport and substantiated once more the advantage of intermodal transport solutions.

The combination of approaches provides decision makers with the necessary information to compare alternative transport strategies on multiple criteria. It is particularly useful in helping them make route choice decisions.

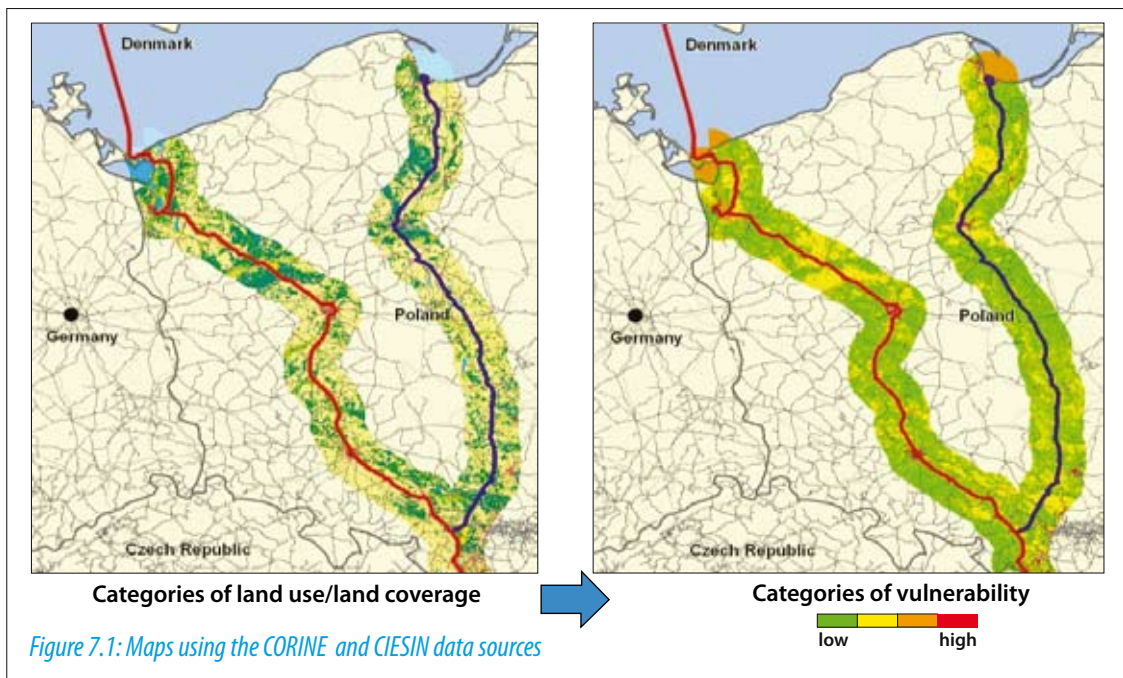


Figure 7.1: Maps using the CORINE and CIESIN data sources

Project no. 513567

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