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FREIGHTWISE

Management Framework for Intelligent
Intermodal Transport

Integrated Project (IP)

Sustainable surface transport - Rebalancing and integrating different transport modes

**Deliverable 11.1**
**'Freight Market Structure and Requirements for Intermodal Shifts'**

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**Freight Market Structure and Requirements for Intermodal Shifts**

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## ABBREVIATIONS

| | |
|---|---|
| ADB | Asian Development Bank |
| AFD | Agence Française de Développement (French Development Agency) |
| AGTC | European Agreement on Important International Combined Transport and Related Installations |
| CF | Cohesion Fund |
| EBRD | European Bank for Development and Reconstruction |
| EIB | European Investment Bank |
| ERDF | European Regional Development Fund |
| ETCS | European Train Control System |
| ISPA | Instrument for Structural Policies for Pre-Accession |
| IWT | Inland Waterway Transport |
| KfW | Bank Group |
| NRIC | National Company for Railway Infrastructure |
| NSRF | National Strategic Reference Framework |
| OP | Operational Program |
| PPP | Public-Private-Partnership |
| SG | State Gazette |
| SF | Structural Fund |
| SOP | Sector Operational Program |
| TEN-T | Trans-European Network for Transport |
| TRACECA | Transport Corridor Europe-Caucasus-Asia |
| WB | World Bank |

## EXECUTIVE SUMMARY


### Background

This report aims at providing a comprehensive analysis of the freight market structure, modal drivers, requirements for intermodal shift and macro economic variables and dynamics with particular reference to expected changes due to future market and technology trends which have an impact on the intermodal market functioning.

This report represents the findings from the activities carried out in Work Package 11 - Freight Market Characteristics (WP11), during the first phase of the FREIGHTWISE project.

WP11, together with WP12 (Requirements Generator), will provide the basis of the FREIGHTWISE Framework, analysing the macro economics implications, modal drivers, RTD findings and the EU policy impact.

WP11 has two main phases:

- The first provides an overview of the present (intermodal) market situation at the beginning of the project
- The second phase will reassess the situation of the market at the end of the project when the results from FREIGHTWISE become available together, with output and results from elsewhere which already have affected (or could do so in the near future). In the second phase of the project, the initial WP11 findings and deliverable will be reviewed and extended in the light of lessons learned from the business clusters and demonstrations.

The aim of the market assessment – Phase 1 – is to examine the structure of the intermodal transport market and its evolution; its actors, the variables, characteristics, and scenarios that need to be taken into account in the development of the FREIGHTWISE framework and system architecture. This is the subject of this report, D11-1.

The report cannot attempt to be exhaustive across modes and EU countries, but it helps to identify the scope of actors, roles, processes, dynamics, transport environmental changes, and decision drivers that must be fully reflected in the FREIGHTWISE framework architecture.

The main findings in the report are summarised below.

### The macro intermodal transport environment

The results of the analysis of the intermodal transport market provide a valuable insight into the functioning of the market and how this might be modified to achieve a higher proportion of intermodal transport, and how these insights may be combined, together with the analyses in later sections of the report, to indicate the underlying market requirements for intermodal logistics information flows.

There is a mapping of the intermodal markets, its requirements, its actors, and their requirements; derived from an analysis of the freight market structure and functionality that have been analysed essentially from a general applied economic and a business economic viewpoint. Attention has also been paid to an analysis of the main modal drivers (e.g. reliability, time windows, cost of inventories, cultural behaviours) as a collection of factors to be addressed in the development of seamless intermodality.

The intermodal market tends to be dominated – save for the feedering of inter-continental containers – by RoRo transport using trailers and/or swap bodies (or to an increasing extent the 45 ft pallet-wide container).

The principal intermodal actors are the freight-forwarders (who dominate in Italy and Spain) and the shippers, increasingly using 3PL and 4PL suppliers, which may be regarded as the 'freight integrators' identified as policy targets by the European Commission.

These freight integration services are critical if the various technological, organisational, and administrative barriers to increasing the share of intermodal transport are to be removed. The major weakness of the present-day market is that actors and actions have not yet managed to overcome the above-mentioned obstacles. For instance, many companies find the threshold for using advanced Information Technology and IT-based management tools still too high in terms of costs and necessary know-how. Standards are too wide or inadequate and do not support the interaction of all parties involved.

Other requirements of intermodal transport users include: improved infrastructure; the development of door to door sea motorway connections; the liberalisation of port services, and the opening up of the rail freight market across Europe.

(N.B. Although not specifically analysed in the report, it is interesting to note that in countries like Italy (and Spain), the forwarders, which are often small companies, make the 'transport solution choice'. Hence, cultural factors can play a strong role in the selection of the transport mode. One implication is that no common intermodal management solution might be of help to fill in the gaps and diversities, though this does not obviate the need for standards and common nomenclature.).

**ICT**

The analysis of current market offerings highlights two main types of portals:

- Independent portals dedicated to transport and logistics business;
- Portals of logistics operators offering innovative on-line services to the supply chain,

The first type of portal, developed by the biggest freight forwarders worldwide, shipping lines and express couriers, are proprietary solutions, which give the possibility to track and trace the freight flows only for transports completely organized by those actors. These solutions do not respond to the growing demand of interoperability among different ICT systems, and exclude small and medium sized enterprises (SMEs) from the opportunity to offer similar services, as the development costs of proprietary systems are too high.

The second type of portal seems to be more in line with the needs for interoperability and the requirements of SMEs. In this context many initiatives have been launched with different results in terms of utilization and client satisfaction. So far, there is no leading portal creating a sort of common standard, and many alternatives remain open. Hence, a new portal will enter in an immature market, characterised by open opportunities and, at the same time, significant risks

In the context of FREIGHTWISE, the development of 'Virtual Transport Services' will provide an interesting possibility to manage information related to the optimisation of the available multimodal resources. It will be possible create new, interesting links among different nodes in specific areas, if the business context will support the choice. Simulation of the total cost of a logistics chain could also be a relevant requirement the users will ask for from an independent software tool set.

The main requirement for next generation tools will be related to interoperability among existing EDI and WEB services. It is envisaged to create of a large community of users (big players, public bodies and companies) sharing relevant information about the potential demand and services in transport and logistics, via a dedicated network of interoperable applications able to enhance the effectiveness and efficiency of existing business processes.

**Trades, traffics and corridors scenario**
In this area of work the analysis has been tailored to ascertain and illustrate the main logistics/intermodal corridors in Europe;

- their potential in terms of growth (some corridors in EU are saturated while others are emerging);
- the role of logistics for the future development of trades and transport flows, and
- the role of the freight integrating services and their impact on the intermodal market functioning.

Various economic studies and statistical sources were used for the analysis, notably NEA, ISIC, UIRR, BMT, UIC, and MDS-Transmodal.

The review of these studies and statistics indicates that there are a number of broad corridors that appear to have the potential for intermodal transport service development. This potential is set in the context of a 50% overall growth in freight transport, with short sea transport and road transport exceeding a 50% growth rate.

The development of road and rail transport over the period up to 2020 will vary between corridors and within countries. According to the UIC study (2000 – 2015) Portugal and Poland are the countries offering the most growth potential for combined transport, despite an expected fall in the amount of rail transport in Poland.

The most promising corridors for intermodal transport in Europe will be those with the highest international transport demand and relatively low supply of intermodal transport, while having a considerable trade volume in the background. This provides the essential economic underpinning for the growth of intermodal transport.

The development of an effective management and IT infrastructure will be needed for setting up, monitoring, and managing intermodal chains. This infrastructure will support the interaction with other service partners in the chain, but also with external actors, such as traffic management services, customs offices, and other relevant public bodies.

At this moment the cooperation in European intermodal transport networks, between stakeholders (including shippers), is mostly vertical in a client – supplier relationship. The objective of FREIGHTWISE, encapsulated in the content of the above paragraph is to improve the situation by establishing the necessary degree of required horizontal network cooperation.

**Statistics on the European Intermodal Market Size**
Country-to-country trade data for all EU27 countries in 2005 was extracted from the MDS Transmodal World Cargo Database, which includes estimates of the amount of unitised trade compared to non-unitised trade for each commodity for each country-to-country pairing. A freight origin-destination matrix, originally developed for the ETIS project, was used to estimate region-to-region flows of trade within Europe.

The results of the analysis suggest that:

- Intra-EU trade (for all 27 Member States in 2007) amounted to some 1,309 million tonnes, of which an estimated 553 million tonnes or 71 million TEU (42%) was unitised;
- Extra-EU trade amounted to 2,053 tonnes, of which an estimated 383 million tonnes or 49 million TEU (19%) was unitised;

**The impact from Enlargement on the intermodal market**
The Central European countries generally exploit the advantages of a favourable geopolitical position for managing not only their own domestic transport, but for being, effectively, a large 'transport node' for freight transport flows in the transit directions West-East and North-South, by using environmentally friendly transport & logistics solutions.

European Union membership provided an significant impulse to the Czech Republic, Hungary and Poland. These countries now benefit from the move of production from Western Europe. An expansion of logistics markets, a growth in the production and the retail sector, and improving transport networks in these new member countries are a logical result of this progress. (The two recent new members, Bulgaria and Rumania are experiencing similar tendencies).

Considering costs, access and property factors important for logistics, the ranking of the Cushman & Wakefield, Healey & Baker: European Distribution Report puts the Czech Republic in 4th, Poland in 5th and Hungary in 7$^{th}$ places.

Based on the analysis of this section, FREIGHTWISE could provide two main results to improve the position of intermodal transport in the CEEC countries: a) better information about opportunities in terms of logistics facilities, and b) a harmonised approach across the EU for future development in intermodal traffic flow information.

**The role of public sector and the public private partnerships (PPP)**
This part of the report illustrates the role of the public sector and the public private partnerships (PPP) opportunities with particular reference to the implementation of integrated services. Efforts have been made to illustrate some concrete examples.

(N.B. It should be noted that a critical review of PPP schemes and good practices will be analysed in the MOSES project. Hence the overview provided in this report is aimed at providing a useful background for that purpose).

A survey was developed by the CORELOG project about the incentives to be distributed to the subjects involved in the development of logistics operations and of different transport modes (rail transport, short sea shipping and motorways of the sea). According to the study, incentives should be mainly directed to nodes and infrastructures, while measures for innovation of logistics operations equipment and for transport users are not considered as a priority.

A successful Public Private Partnership not only depends on the legal, institutional, and political impediments that must be overcome, but ultimately depends on the financial justification of the project. Public transport agencies must select the best investments, while private sector must increase stockholder value by earning a reasonable return on investments.

Based on what has been investigated, FREIGHTWISE could contribute mainly on the design phase of a PPP initiative, especially for the adoption of the generic framework in which all the processes and actors of multimodal transport are managed according to each role in the chain.

**Legal and regulatory framework and their impact on the market development and on modal choices**
This section provides an overview and categorization of relevant laws and regulations with particular reference to intermodality and the implementation of integrated services. The main laws and regulations have been mapped at European level and at national level for the Eastern Countries.

The research on quantitative data and information indicating the impact of laws/ regulations related to intermodality showed that the relationship between a law and its result is more of an assumption than a fact. The parameters that may affect the market of intermodal transport are numerous and data such as freight flows in intermodal transport, share of shippers in the market or the development of intermodal nodes could certainly be an indication but not a proof of the relationship between cause and result.

Moreover, the creation of the legal and regulatory framework for intermodal transport in the new socio-economic context in Eastern Europe started only during the last years and this process is not yet finished. Therefore, it would be difficult to assess the impact of this factor on the development of combined and integrated transport services. On the other hand, the statistics covering the intermodal transport in the countries are fractional and incomplete, i.e. unreliable.

**EU supportive funding schemes and their impact to the intermodal market**
This section provides an overview and categorization of relevant EU supportive funding schemes with particular reference to the implementation of integrated services. The scope of this work was aiming at mapping and identifying the main programmes and funding schemes made available to support the sustainable development of intermodality.

Based on the findings and analyses conducted, it seems that the most appropriate ways of the EU funding for aims of the FREIGHTWISE project are as:

- European Regional Development and Cohesion funds for “hard” infrastructure
- Marco Polo for modal shift from road
- TEMPO/EASYWAY for support of ITS solutions on the TEN-T network
- ISPA funds for candidate countries

These sources are usually combined, if this is allowed both at the national and EU level, for optimization of resources.

The EU funds availability could be also an additional factor for increasing the investment attractiveness for the private sector. The time horizon of currently planned financial support extends until the year 2015.

**The impact from higher security requirements on the intermodal market**
The objective of this section is to present insights to the effects of the new security regulations in the maritime transport sector and the overall performance of the logistic chain. The regulations involved are more directly affecting the maritime leg of multimodal transport than other aspects of the total logistics chain: the IMO ISPS code and the US Container Security Initiative.

It is not clear whether the approach derived from the US concerns with the global movement of goods, principally sea containers, hampers the objective of achieving a seamless transfer of goods through the maritime links of intermodal transport chains.

Any security initiative should be based on an accurate assessment of the threats involved. If not then the logistics chain will be less efficient than would otherwise be the case.

The development of FREIGHTWISE framework may assist in providing information connections (infrastructure) and flows across them to improve security efficiency for intermodal logistics.

**Conclusions**

The result of the activity shows an increasing interest in intermodal and multimodal transport and that one of the limiting factors is the fragmentation of services provided that does not permit standardisation and reduction of distribution costs.

ICT offers solutions, but the level of adoption is low, except for very small companies.

A framework that would permit SMEs to play a role in the logistics and transport world together with big players would contribute to the dissemination of services and to a general growth of knowledge about processes and communication mechanisms.

The FREIGHTWISE framework should support process interoperability, software interoperability and chain actor profiling.

As things now stand, the use of intermodal/multimodal goods transport faces a certain number of hurdles. A change of mode during a journey is more a change in system than a simple transhipment operation. The resulting friction costs have direct impact on the competitiveness of intermodal/multimodal transport.

There are clear “inabilities” to interconnect the different modes:

- infrastructure and transport equipment
- operations and infrastructure use, and in particular that of terminals
- services and regulations aimed at the modes

Intermodality may be regarded as a quality indicator of the level of integration between the different modes: more intermodality means more integration and complementarities between modes, which provides potential for a more efficient use of the transport system (co-modality). The economic basis for intermodality is that the transport modes that display favourable intrinsic economic and operational characteristics individually can be integrated into a door-to-door transport chain in order to improve the overall efficiency of the transport system.

Intermodality is not bound to certain modes. It is a trading and mobility issue in which rail, water, air and road are called on to contribute to the optimisation of the whole, where they are supported by advanced information and communication services. Atthe level of transport operations, new information and communication technologies will improve the utilisation of the existing capacities.

Looking at a generic framework supporting intermodal chains, the FREIGHTWISE project should support the reform processes of transport and logistics markets, providing a way to minimise costs and enhance the competitiveness of different actors through a standardised approach.

In the last years the market of innovative EDI and WEB services dedicated to transports and logistics is undergoing a continuous evolution, and it is possible to identify two main emerging “clusters”:

- portals created by large logistic operators, through which these actors offer added services to their clients beyond the core service, represented by the transport of goods;
- independent portals offering innovative services like the exchange and sharing of data and information following specific parts or complete transport chains.

The first type of portals comprises proprietary solutions, which give the possibility to track the freight flows for transports completely organized by those actors only. These solutions do not respond to the growing demand of interoperability among different ICT systems, and furthermore exclude small and medium sized enterprises (SMEs) from the opportunity to offer similar services, as the development costs of proprietary systems are too high.

The second type of portals seems to be more in line with the needs of interoperability and the requirements of SMEs. In this context many initiatives have been launched with different results in terms of utilization and client satisfaction. So far there is no leading portal creating a sort of common standard, and therefore many alternatives remain open. FREIGHTWISE should contribute to establishing such standards and to facilitate interoperability between portals.

Operators involved in logistic chains need an electronic infrastructure to share information and services in order to enable effective and efficient e-business processes. Furthermore, intermodal/multimodal transport faces strong challenges, as it requires collaborations among a huge number of operators.

This is a crucial moment with a significant opportunity because:

- companies (SMEs) are ready to listen to proposals aiming at improving efficiency and effectiveness;
- there is a lack of information, best and worst practices, tools to adopt, which should be filled;
- the gap between what may be termed e-opportunity and e-reality needs to be bridged, in order to reach practical and relevant benefits.

The diffusion of wireless technologies and the growing use of mobile connections (GPRS, UMTS), will boost and facilitate the electronic data and information exchange, providing further opportunities to EDI initiatives. Therefore it is necessary to be continuously aligned to the emerging standards and technologies, in order to be ready to profit form the opportunities offered by this immature and growing market.

The main aspect for next generation tools is related to INTEROPERABILITY among existing EDI and WEB services in terms of technical standards, process interoperability and data representation.

# INTRODUCTION

## Freightwise

FREIGHTWISE is an integrated project within the EU's 6th Framework Programme that aims at bringing together three different sectors:

- Transport Management: shippers , forwarders, operators and agents ;
- Traffic and Infrastructure Management: Rail, Road, Sea, Inland waterways ;
- Administration: Customs, Border Crossing, Hazardous Cargo, Safety and Security.

The FREIGHTWISE project will support the co-operation of these sectors in order to develop and demonstrate suitable intermodal transport solutions in a range of business cases. The project shall support the complex service integration into integrated transport chains. The technical expertise in the project will focus on the development of a reference framework for intermodal transport and the integration of relevant IT systems - including legacy systems - in the business cases.

The overall objective of FREIGHTWISE is to promote the modal shift from exclusive road use to intermodal freight transport. The intention is to support road, short sea shipping, inland waterways and rail transport for closer cooperation among modes. This main objective is to be achieved by improved supply chain management, greater access to information, and enhanced data exchange.

The FREIGHTWISE project is intended to create innovative opportunities for users of intermodal systems that facilitate large and small stakeholders engaged in industry, transport, or merchandising; involving both public and private partnerships.

The FREIGHTWISE Framework (FWF) will be developed with supporting input from business cases. The FWF will develop the necessary stakeholder, business, and process models for functions necessary for planning and managing inter-modal transport chains.

## Context

The structure of the FREIGHTWISE activities is illustrated in Figure 1. Workpackage 11 (WP11) and WP12 are the two activities that provide the project baseline in the form of gathering information about the structure of the (intermodal) market (WP11) and (intermodal) market demand (WP12). They analyse commercial implications, modal drivers, RTD findings and EU policy impact, and develop the basis of the FREIGHTWISE Framework.

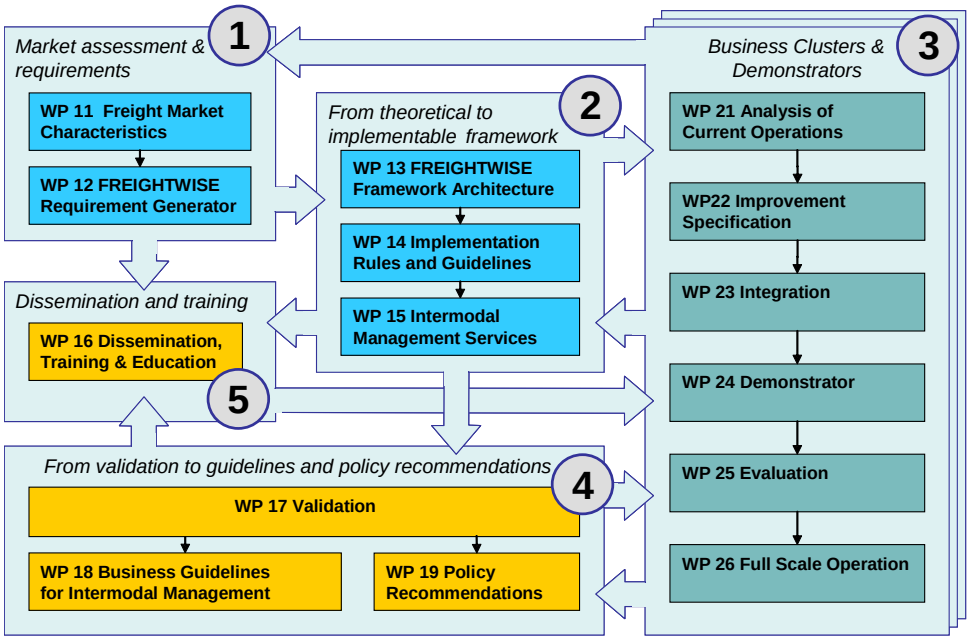



**Figure 1 FREIGHTWISE project structure**

## Workpackage 11

The findings of WP11 provide an inventory of the intermodal transport market and its environment, covering demand and supply characteristics, modal drivers, business models, and legal framework.

The analysis of the market also covers the role of the public sector and the impact of the legal and regulatory framework. Hence, the institutional, organisational and legal aspects of intermodal transport, with particular reference to the implementation of integrated services have been analysed.

A review of recent studies and trade journals and publications concerned with the intermodal freight market has been carried out to define pertinent market characteristics and modal choice drivers, as well as factors that are affected by changing economic, technical, social and legal conditions. Examples of such factors are the progressive transport market liberalisation across Europe, the impact of the EU enlargement, higher security requirements, the increase in energy demand, the increase of the size and number of the fleet, the relocation of productions and distributions towards the east, the evolution of the corridors, and the increasing availability of low-cost systems using satellite positioning and RFID technologies.

The inputs provided by WP11 represent the factual background needed to develop requirements towards intermodal transport in a realistic and pragmatic way.

WP11 contributes to the end results in terms of a better understanding of the forces which govern the market situation and which have an impact on the strategy development. It complements the input from the user community within FREIGHTWISE with economic and structural input.

The input provided by WP11 needs to be taken into account in the development of the entire FREIGHTWISE framework.

It should be noted that while WP11 undertakes primarily desk research, WP 12 engages the user base of FREIGHTWISE and relevant organizations to achieve a comprehensive picture

of requirements. The consortium partners and the members of the High Level Advisory Board will provide important inputs. This will reflect the complete universe of business reality, regulatory framework and EU policy drivers.

# DEFINITION AND ANALYSIS OF THE MACRO TRANSPORT ECONOMIC ENVIRONMENT

## The Intermodal Market

Increasingly congested motorways, rising oil prices and concerns about the environment and climate change demand the optimisation of transport systems and transport processes. For all transport which needs to be carried out, a rational choice must be made for the most effective and efficient transport option. The framework conditions are in favour of intermodal transport operations, in which the most efficient transport options are used for the different legs of transport. A characteristic feature of intermodal transport is its use of standard loading units, which are carried by road as well as by rail or waterborne transport (sea, inland waterways).

Intermodal traffic flow of cargo in maritime containers is the biggest market in intermodal transport. It is also possible that to use intermodal transport for European continental flows (see Figure 2). These Continental flows have their origin and destination within Europe and are usually door-to-door flows. Although this market is dominated by road haulage, there are intermodal transport options. For example, roll-on/roll-off (RoRo) services are often used in continental transport chains or railway connections between inland terminals. For European continental cargo, the maritime container is less popular and the transport systems are usually based on the movement of semi-trainers or swap-bodies, or 45-foot, pallet-wide containers.

(N.B. On the other hand, trans-continental flows globally are, of course, dominated by containers as the preferred loading unit).

The reason for using intermodal transport can simply be that there is no connection by one mode of transport between origin and destination and the shipper therefore has to change to another mode of transport. For example, trucks which use ferries or the rail tunnel to cross the English Channel are, technically speaking, intermodal transport. On the continent of Europe, the main reason for using intermodal transport is the perceived cost and reliability advantages which it brings on longer distances. The costs for terminal cartage and trans-shipment have to be offset by the scale advantage of rail, barge and short sea at a certain transport distance.

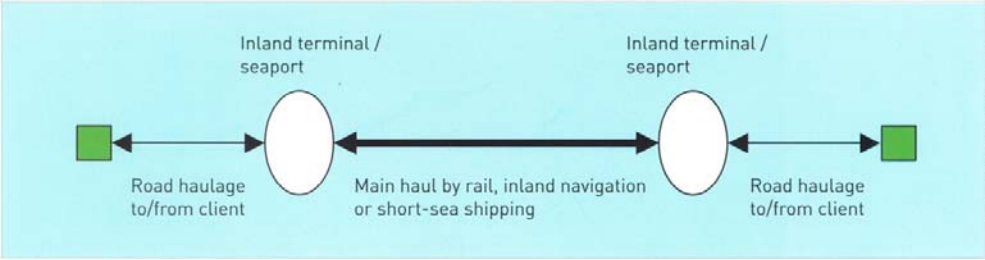



**Figure 2 Schematic overview of continental intermodal transport chain**

**The Main Intermodal Actors**

A typical trade process involves the shipment of goods between countries and the management of information and business processes required to complete the shipments. It also involves a complex network of trade participants, namely shippers/exporters, forwarders, carriers, consignee/buyer, banks and customs and regulatory agencies, sometimes as many as 25 different parties and 30-40 different trade documents, as illustrated in Figure 3 below. Various documents and types of information are exchanged at each step of the process. The information sharing is critical to ensure a smooth, secure and optimized transaction. From a government or regulator's point of view, the information exchanged at each step of the process ensures proper control and audit trails in the supply chain.

The key decision maker actors involved in the identification and choice of transport solutions are the shippers and freight forwarders.

It is their decisions that will determine how modal market shares will move over the next decade or so and how they will respond to the development of intermodality. The research has been targeted on discovering how their decisions are made and how they may best be influenced.

The research priorities have been developed from the relevant research that has been made into how shippers and freight forwarders arrive at modal choice decisions.

There are national cultural differences to account for the tendency to select road only transport chains, essentially through variations in availability of infrastructure for intermodal alternatives.

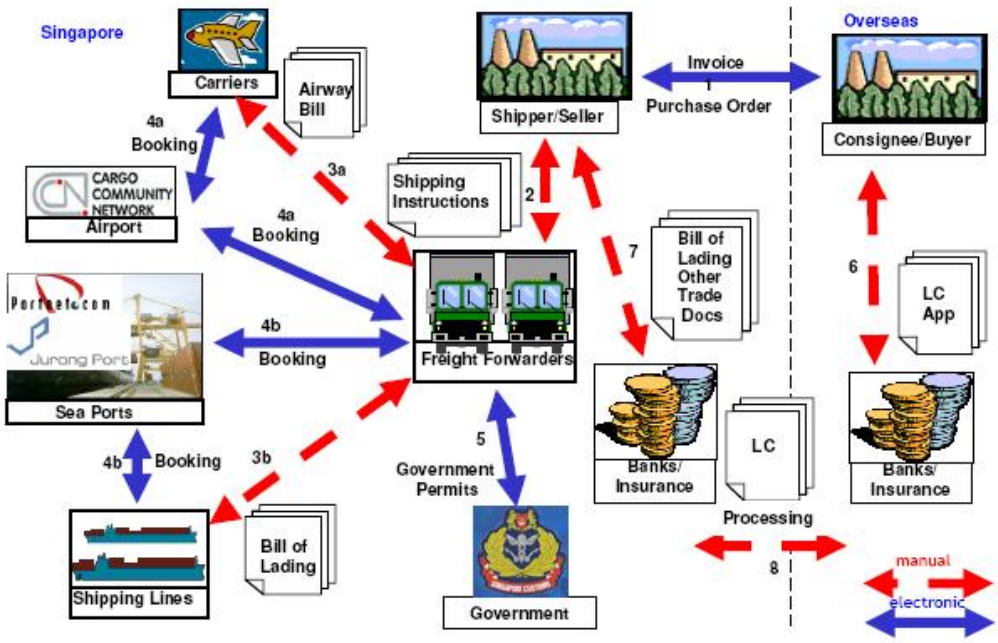



**Figure 3 Illustration of a typical trade transaction**

*Freight Forwarders*

Operator description

The freight forwarding market has been a major beneficiary of an increasingly globalised world economy due to the development of extended supply chains, integrating manufacturers, suppliers and retailers on a worldwide basis. This has led to significant year-on-year growth in international trade volumes and the need to combine various modes of transport to get cargo from origin to destination (increased imports from Asia to Europe is one example). Freight forwarders' revenues - and profits - have surged and this has resulted in structural changes to what for many years was a conservative and stable industry.

These changes have included an unprecedented level of mergers and acquisitions from which a small number of global players has emerged. Many long-standing brands have been subsumed: MSAS, AEI, Emery, Danzas, ASG, Wilson, Circle, to name but a few. In their place, mega-carriers, such as DHL Global Forwarding, Schenker, UPS Supply Chain Solutions and Kuehne + Nagel have evolved. As with the rest of the logistics market, private equity is also starting to play a major role in the sector's development.

The levels of profitability in the market, its growth prospects and the asset-light nature of freight forwarders' business models have made the sector highly attractive to investors. The industry's attribute of counter-cyclicality - that is, its ability to increase margins in times of economic downturn - gives it an advantage over other segments of the logistics market.

This is not to say that there are no clouds on the horizon. A cooling US economy would have serious repercussions on trans-Pacific and trans-Atlantic trade, although the growth of intra-Asian volumes would go some way to mitigate this. In addition, freight forwarders have a poor reputation with some customers for being a low value-adding resource, providing a range of commoditised, cost based services. Major challenges remain in overcoming these negative perceptions.

International freight forwarders play an integral part in the transportation process.

A freight forwarder organises the safe, efficient movement of goods on behalf of an exporter, importer or another company or person, sometimes including dealing with packing and storage. In other words, a freight forwarder is a non asset based transport service provider that dispatches shipments via asset based carriers and books or otherwise arranges space for those shipments. Carrier types include waterborne vessels, airplanes, trucks or railroads.

In the 'White Paper on the European Transport policy until 2010', the European Commission introduced the concept of a Freight Integrator and referred to them being organisers of intermodal full load transports. As one consequence of this definition, the role of a Freight Integrator became a subset of the term freight forwarder.

Taking into account the type of goods and the customers' delivery requirements, freight forwarders arrange the best means of transport, using the services of shipping lines, airlines or road and rail freight operators. In some cases, the freight forwarding company itself provides the service.

Companies vary in size and type, from those operating on a national and international basis to smaller, more specialised firms, who deal with particular types of goods or operate within particular geographical areas.

Typical activities include:

**Transport services:**

- researching and planning the most appropriate route for a shipment (taking account of the perishable or hazardous nature of the goods, cost, transit time and security);
- offering consolidation services by air, sea and road - ensuring cost effective and secure solutions to small shippers with insufficient cargo to utilise their own dedicated units;
- liaising with third parties to move goods (by road, rail, air or sea) in accordance with customer requirements;

**Value added services:**

- arranging appropriate packing (taking account of climate, terrain, weight, nature of goods and cost) and delivery or warehousing of goods at their final destination;
- obtaining, checking and preparing documentation to meet customs and insurance requirements, packing specifications, and compliance with overseas countries' regulations and fiscal regimes;
- arranging insurance and assisting the client in the event of a claim;
- arranging payment of freight and other charges, or collection of payment on behalf of the client;

**Informatics services:**

- offering tailored IT solutions and EDI (electronic data interchange) connections;
- transmitting data by internet and satellite systems, enabling real-time tracking and tracing of goods;

**Special services:**

- arranging air transport for urgent and high-value freight and managing the risk door to door;
- arranging charters for large volume, out-of-gauge or project movements by air and sea;
- acting as broker in customs negotiations worldwide to guide the freight efficiently through complex procedures;
- dealing with special arrangements for transporting delicate cargoes, such as livestock, food, medical supplies and other fragile goods;
- arranging courier and specialist hand-carry services;

**Other expertise:**

- working closely with customers, colleagues and third parties to ensure smooth operations to deadlines;
- maintaining visibility and control through all phases of the journey, including the production of management reports and statistical and unit cost analysis;
- acting as consultant in customs matters;
- maintaining current knowledge of relevant legislation, political situations and other factors that could affect the movement of freight.

At more senior levels, the role may also involve managing staff and overseeing activities within a department, or specialising in a particular area, such as sea freight or air freight.

Freight forwarders provide a number of services. At the beginning of a sale, they can provide the exporter with a quotation on:

- Freight costs;
- Port charges;
- Consular fees;
- Cost of special documentation;
- Insurance costs; and
- Freight forwarder's fees.

Freight forwarders operate on a fee basis paid by the exporter. The forwarders' fees consist of an agreed-upon amount, plus documentation charges. The cost for their services should be calculated into the price charged to the customer. Freight forwarders also collect a percentage of the freight costs from the carrier.

Over the time freight forwarders' role has changed. Instead of only acting as an intermediary, many freight forwarders actually became transport operators and have their own transportation assets. Furthermore, to achieve competitive rates, most of them are holding contracts or special arrangements with other transport operators. This makes them less neutral in their decision-making.

In the case where freight forwarders have agreements with special transport operators, they don't always consider possibilities that might be cheaper, safer or better for the environment than those offered by their partners. There cannot be unprejudiced decision-making regarding the choice of mode of transport or the most efficient combination of varying transport modes, if this procedure prevails. So, a more sustainable solution, as regards environmental issues, can sometimes be, for the reason mentioned above, the less attractive option for a forwarder.

Comparing this model with the newly evolving Freight Integrator definition, it actually shows a lot of similarities but also differences.

The similarities, especially when looking at the freight forwarder in the traditional meaning as a "spediteur", rest on the independence he has and therefore neutrality between the different modes of transportation. Also the handling of all of the documents concerning one shipment, the choice of transportation mode, the arrangements for pick-up, the filling in the necessary documents with authorities, the monitoring the shipment and so on bears a certain resemblance to what would be a desirable task for a Freight Integrator.

When it comes to differences, there are quite a few to mention: particularly when the freight forwarder acts simultaneously as transport operator with their own assets. In this situation, the required characteristic of a neutral freight agent, considering all possible transport modes is a somewhat utopian view. When organising transport or accomplishing them, especially in the harsh business of freight forwarding, it very often all comes down to the price. Therefore filling up own existing capacities is more important than trying to achieve the best solutions for customers and the society.

Market description

The freight forwarding market is highly fragmented with low barriers to market entry and exit. This has historically allowed very small enterprises to enter the market and compete effectively with the major players, depressing margins. However this situation is changing as a small number of companies have achieved product differentiation through worldwide freight networks, underpinned by global technology.

The forwarding sector has also been helped by a surge in international trade volumes, driven by the economies in the Asia Pacific region, especially China. This is increasingly changing the way in which this sector is perceived.

Figure 4 shows the growth of regional freight forwarding markets.

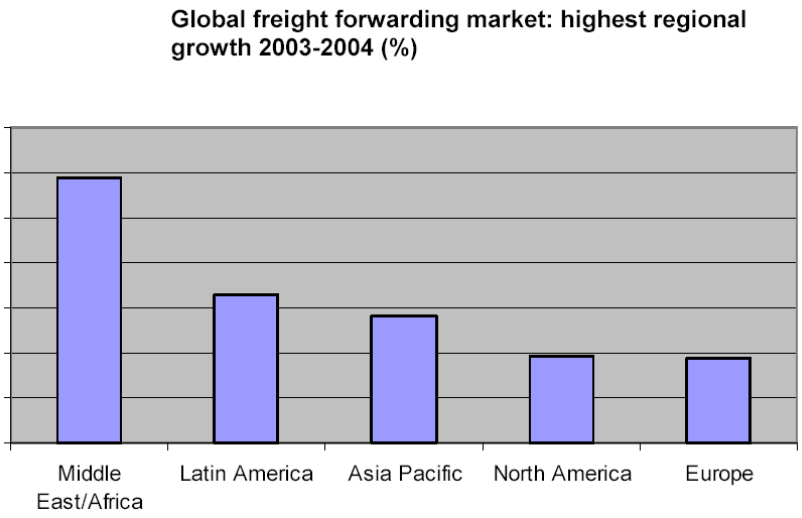



**Figure 4 Global Freight forwarding market. Source "Study on Freight Integrators – To the Commission of the European Communities"**

Figure 5 shows the global growth of freight forwarders operators in terms of revenue, operating income and margin.

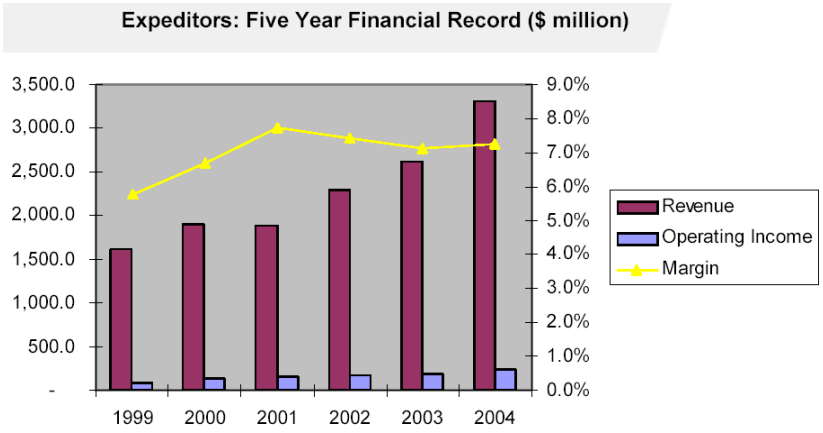



**Figure 5 Freight forwarder growth. Source: "Global Freight Forwarding 2005 – A comprehensive report analysing one of the fastest growing sector in the global logistic industry".**

The global scenario changes rapidly: to stand out from the crowd it is necessary to position oneself in the market with value added services. This means that the additional services today could become the basic requirements for customers when choosing a freight forwarder in the future.

The status and development of the most common value added services are shown in Figure 6. It is clearly visible that forwarding and haulage of shipments are and will be the key aspects for freight forwarders. They appear in about 80% of all relevant cases and will not change at all over time. The same basically applies for distribution and warehousing as physical, transport related tasks play an important role in the transportation chain.

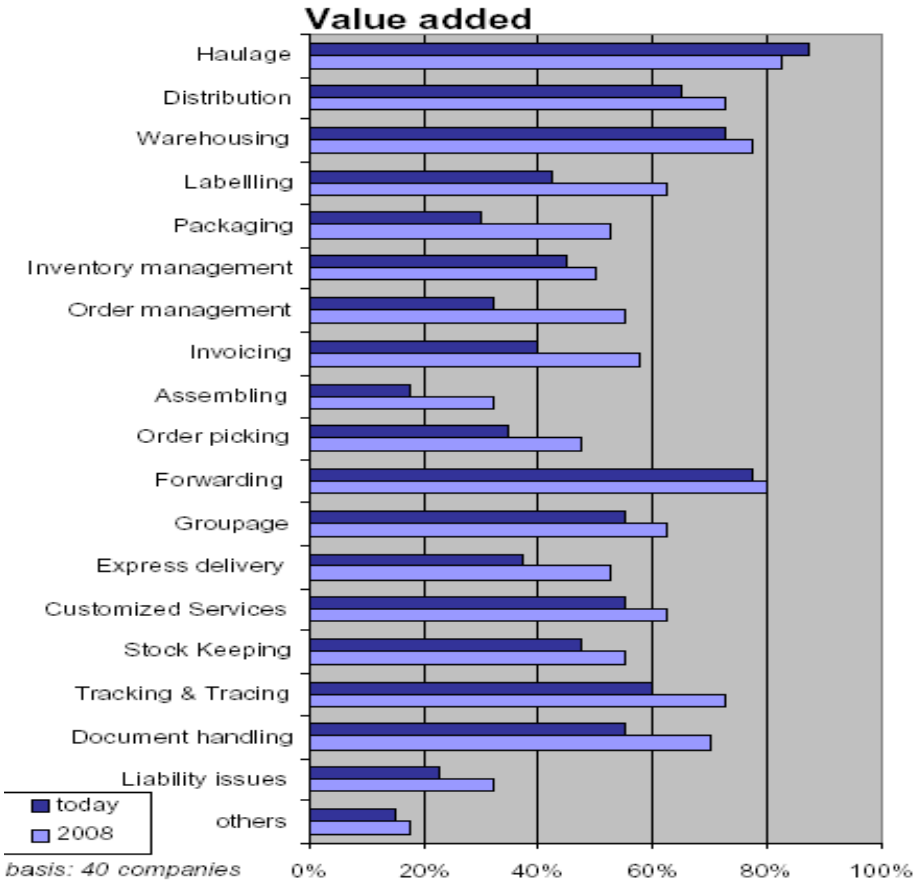



**Figure 6 Added Value Services. Source "Study on Freight Integrators – To the Commission of the European Communities"**

The Difference between a Freight Forwarder and a Broker: Why It Matters

A forwarder is a Common Carrier under the law and, as such, a forwarder must file evidence of cargo insurance coverage with the Federal Motor Carrier Safety Administration (FMCSA).

Forwarders must also adhere to the so-called Carmack Amendment related to liability, requiring proper claims handling. A forwarder has the same cargo claims and cargo insurance responsibility as that of a carrier.

Brokers, on the other hand, do not have a statutory freight claims (Carmack) liability and can get by with contingent coverage (less than half the cost of primary coverage) because they're not liable in the event of a loss, absent negligence on the broker's part. Contingent coverage means to insure a loss when the at-fault carrier's insurer denies or fails to provide coverage.

A broker is not a carrier. Brokers arrange transportation with a carrier, either on behalf of the shipper or behalf of the carrier. Under the law, brokers are not statutorily responsible for loss or damage and cannot issue their own bills of lading with their name in the carrier field.

It's important to appreciate the difference between contingent and primary cargo insurance coverage: you can never simply assume a broker's policy will cover the goods in the event of a mishap.

Contingent cargo insurance is for the protection of the broker, not the shipper. If a carrier, through tariff or intransigence, determines an otherwise valid claim to be invalid, the contingent cargo insurance that the broker might carry would probably not step into the breach and fulfil the carrier's obligation.

In most cases, contingent coverage kicks in only if the carrier's insurance coverage is defunct. If a carrier simply refuses to accept the claim, often the shipper's only remedy is to hire counsel and attempt to prosecute the claim and trucker in court. Prosecuting the broker would have no effect due to their lack of liability under statute.

The important part of the process here is responsibility and the approach to the application of that responsibility.

A shipper using a broker is not the carrier's (trucker's) bread-and-butter customer. Whether a trucker responsibly processes and pays a claim without being forced by a court of law sometimes is a matter of customer relations and, absent a true customer relationship, the outcome is not assured.

A forwarder, on the other hand, is not only more comprehensively covered by cargo insurance, but also willingly stands up for the customer and works diligently to resolve the issue with the motor carrier on the customer's behalf in a timely and satisfactory way.

*The Shippers*

Operator description

Shippers are primarily producers of goods and services which they market, sell and distribute to their customers.

Shippers are users of freight transport services in all modes of freight transport: deep sea shipping, short sea shipping, air transport, road transport, rail, and inland waterways.

Market description

Globalisation and the steady growth in world trade lead to increased demand from industry for rapid and time-sensitive delivery of goods. To satisfy those demands and to remain competitive, companies are increasingly dependent on user-oriented, high quality and reliable transport networks.

Europe's transport infrastructure is under pressure from rising traffic levels both on road and rail. With surging levels of imports from the Far East, Europe's limited maritime infrastructure is also under severe pressure for the first time. Journey times and the number of unplanned incidents of congestion are rising and reliability falling. Pressure for improved delivery performance standards imposed by production requirements and customers are putting greater strains on existing logistics operations.

Products are competing for market share. Shippers see that products must compete on price and quality and there is a persistent drive to cut costs at every stage in the supply chain - including the logistics chain.

Industry needs logistics solutions that can cope with the pressures put on them from governments, the public, competitors, customers and the supply chain itself. They want to be able to make a choice out of various logistic options. They want to be able to make modal comparisons or comparisons between operators on particular routes. On this issue, the work

of the REALISE[1] Project on transport environmental and economic performance comparisons across transport modes along real trajectories, segments and corridors represents a stepping stone for a clearer understanding of the transport market service characteristics, requirements, and functionalities for the development of intermodal freight transport, including short sea segments, during the next decade.

The amount of road-based logistics services they use varies, but the reliability of road freight is coming into question. This is due to the pressure on road freight, which stems from the attempt by the European Commission to raise the regulatory burden on road freight. This is seen as an attempt to increase costs, reduce flexibility and compel transport users to consider other options. These other options are not yet fully available to industry. The positive effects of rail freight liberalisation will take many years to be felt by shippers (increased number of services offered), but the pressures on road freight from new regulations such as the Working Time Directive and drivers' hour-rules, congestion, and road user charging are immediate.

Combined with fuel price increases and shortages of qualified drivers, companies are facing an uncertain future as regards the reliability and costs of road freight services to supply their factories, warehouses, outlets and their customers.

*Freight Villages*

Operator description

A freight village is a defined area within which all activities relating to transport, logistics and the distribution of goods, both for national and international transit, are carried out by various operators.

These operators can either be owners or tenants of buildings and facilities (warehouses, break-bulk centres, storage areas, offices, car parks, etc...) which have been built there.

Also, in order to comply with free competition rules, a freight village must allow access to all companies involved in the activities set out above. A freight village must also be equipped with all the public facilities to carry out the above mentioned operations. If possible, it should also include public services for the staff and equipment of the users.

In order to encourage ***intermodal transport*** for the handling of goods, a freight village must preferably be served by a ***multiplicity of transport modes*** (road, rail, deep sea, inland waterway, air).

Finally, it is imperative that a freight village be run by a single body, either public or private or under a public-private partnership.

For some experts, the Freight Village concept is an interesting way to concentrate investments in a way that a multimodal node could grow in terms of attraction of intermodal traffic because it is able to provide specific services and related information about costs, performance.

A port is a natural freight village, while the same concept could be adopted by ports and intermodal rail nodes in order to extend the flexibility of transport.

[1]REALISE stand for Regional Action for Logistical Integration of Shipping across Europe (2002-2005). Its overall objective was to develop technological strategies, methodologies, and tools for the European business community and decision-makers in order to encourage the use of short sea shipping. These efforts will focus on the carriage of unitised cargo.

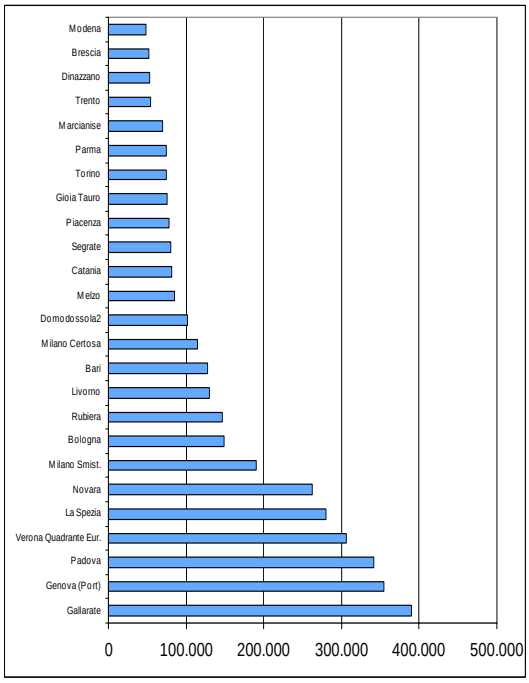
Market description

The main target market of a freight village is represented by all the actors of transport because of the variety of services that could be provided in terms of infrastructures, superstructures and related services.
The growth of freight villages and related information could provide important inputs for Freight Integrators in terms of:

1. Specialisation on full loads
2. Relevant market participation in the field of intermodal transports
3. Intermodal transports as a relevant business field within the company
4. Commitment to intermodality
5. Supporting the idea of environmental sustainability
6. Co-operations and partners

Analysing the terminals in Italy, it is possible to note that Freight villages are the main actors of the traffic at Italian level and that in the management of terminal, the private area is present with the information presented in Figure 7.

| Terminal | TEU |
|---|---|
| Modena | 49.000 |
| Brescia | 52.000 |
| Dinazzano | 53.000 |
| Trento | 54.000 |
| Marcianise | 70.000 |
| Torino | 74.000 |
| Parma | 74.000 |
| Gioia Tauro | 76.000 |
| Piacenza | 78.000 |
| Segrate | 80.000 |
| Catania | 81.000 |
| Melzo | 85.000 |
| Domodossola2 | 102.000 |
| Milano Certosa | 115.000 |
| Bari | 128.000 |
| Livorno | 130.000 |
| Rubiera | 146.000 |
| Bologna | 149.000 |
| Milano Smist. | 190.000 |
| Novara | 263.000 |
| La Spezia | 280.000 |
| Verona Quadrante Eur. | 306.000 |
| Padova | 342.000 |
| Genova (Port) | 355.000 |
| Gallarate | 390.000 |



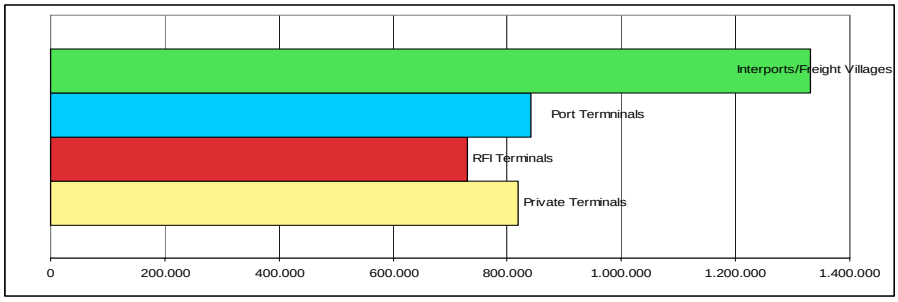




**Figure 7 TEUs handling in Italian Freight Villages**

**The Freight Integrating Services and their Impacts on the Intermodal Market**

*Freight Integrators*

The European Commission's White Paper set out measures to address the transport problems faced by the European Union. A central part of this strategy is the policy of modal shift (though this has to an extent been superseded by the policy of 'co-modality'), which aims to shift a portion of the estimated growth of road freight to alternative modes of transport of transport; rail, inland waterway and short sea shipping. The economic basis for intermodality is that transport modes can be integrated into a door-to-door transport chain in order to improve the overall efficiency of the transport system.

The White Paper proposed the launching of a large-scale programme (Marco Polo) to support intermodal initiatives and alternatives to road transport in early stages until they become commercially viable. It was noted that intermodality will also require rapid introduction of series of technical measures, particularly on containers, loading units, and the profession of freight integrators.

In order to maximise the contribution of the above-mentioned alternative modes of transport, they need to be successfully combined with road transport. Organisers need to be able to build intermodal transport chains to combine the advantages of road transport (geographic coverage, flexibility, small loads etc.), which are particularly suited to the pick-up and final delivery, with the advantages of the alternatives modes (cost reduction through consolidation, accessible capacity, energy diversification, safety) for the main haul.

"Freight integrators" are organisers of door-to-door freight transport using different modes (intermodal transport), who combine these modes of transport to build high quality, efficient and sustainable intermodal transport solutions. They are seen by the European Commission as being the catalysts to facilitate full exploitation of the potential - sometimes hidden, sometimes still to be developed – of intermodal solutions.

Some of the key operations involved in managing freight transport are:

***Organising transport***. This is facilitated by defining a transport chain by describing a set of services that must be undertaken in order for the transport to be performed smoothly. In practice this means handling contracts, quality indicators, timetables etc. The services thus defined and linked may or may not be involved in the physical handling of cargo (a customs office is an example of an actor in the transport chain that is important to the success of smooth transport, but that does not handle the cargo, only the documentation related to the transport). When the chain is defined, the services may be booked automatically through the exchange of electronic booking and confirmation messages. Booking might be triggered by an ERP-system or by a stock-control system in a warehouse.

***Handling documents***. The different service providers along the transport chain need different forms of documentation, to ensure that the transport occurs not only efficiently but also legally. These documents are distributed to the different actors when they are needed. Product documents may also be transmitted to the receiver of the cargo.

Monitoring and controlling the transport. It is important that the transport chain manager has a complete understanding of the status of the transport and the cargo at all times. It is particularly important that information regarding deviations from the agreed schedule is made available as soon as possible. If the deviation from the schedule is unacceptable, the transport must be reorganised, by using the same functions that were used to organise the

transport in the first place. If the deviation is acceptable, information about it must still be communicated to the actors in the remaining part of the chain, and to the receiver.

***Informing other parties of the status***. As indicated in the previous paragraph, many people may be interested in learning the status of the transport. In order to make the intermodal transport chain more transparent, this status information should be made available to the authorised people.

All of these functions come within the role of a freight integrator, but, in addition, freight integrators need to integrate the differing interests of shippers and transport operators, and (in the aspiration of the European Commission) the wider needs of society at large.

*Development of Third and Fourth Party Logistics Providers*

The rapid development in the logistics sector and its significance to industrial companies has led to the development of Third Party Logistics Providers (3PL). The definition of 3PL is that a third party is involved in the relationship between a supplier and a customer, and handles not only the transport function, but also other logistical functions, such as warehousing. Close and long term relationships are catchwords for 3PL. They led the way in logistics outsourcing. Drawing on their core business, whether it be forwarding, trucking, or warehousing, they moved into providing other services for customers. This presented a way for a commodity-service logistics provider to move into higher margin, bundled services.

By definition, 3PL are independent companies that design, implement, and manage a client's supply chain logistics needs. While many of the logistics service capabilities required in a 3PL environment are shared by companies that perform their own logistics functions, there are unique "multi-client" capabilities that are often required if 3PL are to be successful. For example, providers must apply optimisation to logistics functions across multiple clients, while maintaining key data elements for reporting and billing on an individual client basis.

As the 3PL markets have matured, a new type of logistics service provider has emerged, namely Fourth Party Logistics Service Providers (4PL). A fourth party logistics service provider is defined as "an integrator that assembles the resources, capabilities, and technology of its own organisation and other organisations to design, build and run comprehensive supply chain solutions". The evolution of 3PL and 4PL service is illustrated in Figure 8.

Instead of supplying traditional transport and warehousing services, a 4PL offers expanded services with higher added value. He also uses information communication technology (ICT) in the client’s supply chain to add greater value and to help create e-supply chains. The 4PL business model applies information integration, initially in logistics and transport operations, and also achieves full supply chain integration and strategic applications of the information availability to the benefit of its clients. Not only does that represent an application of the e-supply chain, it also leads to the inclusion of supply Web practices in which multiple-players team up flexibly to align to the end consumer.

A successful 4PL should have both the strategic and tactical capabilities. He should have practical logistics experience, especially on the "shipper"/customer side. 4PLs have become alternatives for business process outsourcing. These new BPO logistics service providers enable firms to manage a critical part of their supply chain by providing visibility and integration across multiple enterprises.

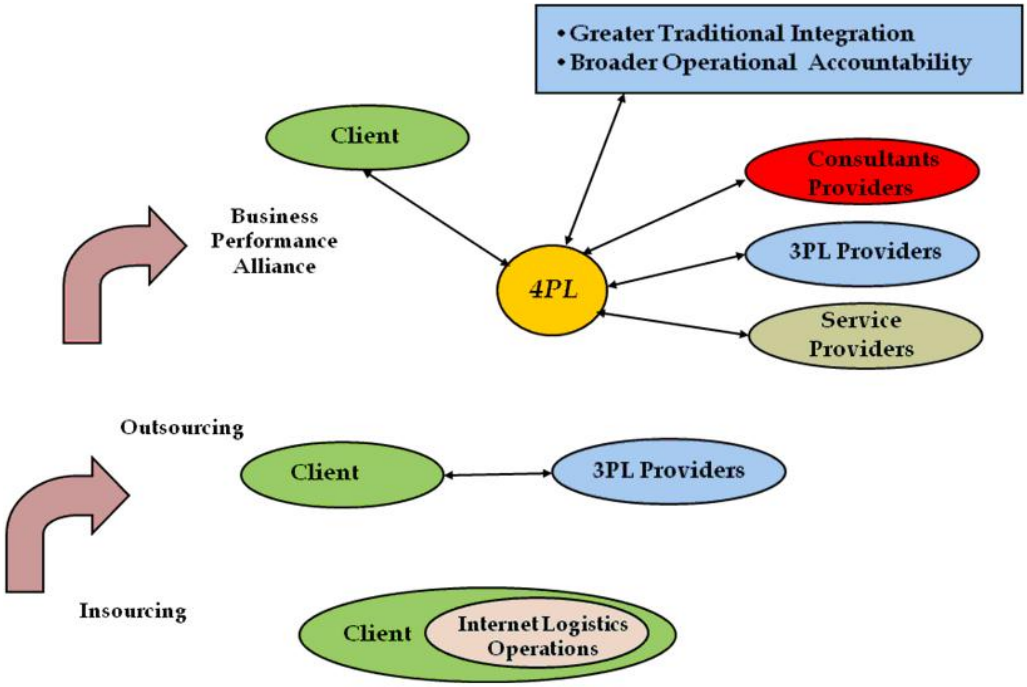



**Figure 8 Evolution in Supply Chain Outsourcing. Dow N. Bauknight, John R. Miller: Fourth Party Logistics (1999): The Evolution of Supply Chain Outsourcing, in CALM Supply Chain & Logistics Journal**

The main requirement of the shippers, who are the customers of intermodal transport services, is to find suitable transport solutions at the right price, coupled with quality. They focus on reducing their total logistics costs, of which transport is only a part, and may therefore be prepared to accept increases in transport costs if there are compensating reductions of other costs, for example, warehousing costs, insurance, packaging etc.

Transport operators are essentially concerned with the supply of transport services. Some operators offer integrated intermodal services but these are normally offered as complementary services to support their main mode. Their high investment in physical assets means that they are focused on asset utilisation rather than reducing supply chain costs. For them more transport means more business.

Reconciling and integrating these differing interests on the part of both shippers and transport operators is the task of freight integrators. In addition, rapidly changing business and administrative requirements demand a high level of flexibility from the transport industry in terms of the services offered.

As has been noted above, the European Commission believes that freight transport integrators have the capability to facilitate full exploitation of the potential - sometimes hidden, sometimes still to be developed – of intermodal solutions. The Commission has identified four areas where action is required to facilitate development of intermodality:

- Improve knowledge, awareness and understanding of intermodal transport;
- Simplify intermodal transport through further standardisation;
- Foster the commitment and co-operation of transport users;
- Clarify the responsibility and accountability in intermodal transport.

These desirable actions implicitly recognise the needs of customers and operators and represent, from the administrative viewpoint, steps to address these requirements that are essential to ensure the future development of intermodality.

A principal objective of European Transport Policy, as described in the White Paper "Time to Decide", is to increase the share of intermodal transport as a means to make better use of existing transport capacities. However, according to the mid-term review of the White Paper, this goal has not been reached, nor has it been possible to achieve the decoupling of transport development from the economic development.

This situation is far from straightforward. "There are many commercial, technical and organisational obstacles to overcome in the process of combining a number of transport services to an efficient transport chain. Rapidly changing business and administrative requirements demand a high level of flexibility from the transport industry in terms of the services offered and the related management systems. Integrated transport management also requires a certain level of business integration, which demands the trust and close interaction of a variety of actors involved in managing the chain, and a commitment to a potential perspective of long term co-operation. Information access and communication possibilities are key elements in this context. Business partners must have the opportunity to communicate with each other and with the authorities."

The major weakness of the present-day market is that actors and actions have not yet managed to overcome the above-mentioned obstacles. For instance, many companies find the threshold for using advanced Information Technology and IT-based management tools still too high in terms of costs and necessary know-how. Standards are too wide or inadequate and do not support the interaction of all parties involved.

Furthermore, although the rapid development of ICT is increasing and facilitating communication on a technical level, there remain a number of additional aspects which have to be addressed if the communication along the intermodal chain is to be efficient. One is the need for common definitions and a common architecture; another is the more complex issue of rules for co-operation between the partners in the chain. The lack of common definitions, data dictionaries and architectures is well known, but there are also wider problems related to the applicability, scope, and commercial acceptance of standardisation efforts.

The questions related to co-operation and commercial integration is inherently complex, due to the competitive nature of the transport market. Research on Supply Chain Management (which can also be applied to the organization of intermodal transport chains) stresses the need for trust, commitment and collaboration. The need for better integration is often recognized among transport chain partners, but the practical solutions—for example, defining the appropriate degree of openness or elements of risk sharing—are not easy to implement. The sharing of information is a contentious issue in many companies.
The need for transparency among the partners in the intermodal chain has been identified. It is a precondition for having knowledge accessible to all relevant partners, but it is also seen as a potential threat which requires a clear definition of the respective roles in the business process. This is why building trust is important, which has to be acknowledged when designing both the commercial agreements and the technical solutions.

**Main Hard and Soft Modal Shift Drivers**

This section provides an overview of the main factors affecting the modal choices of the operators.

Some of the main selling points for large operators, i.e. criteria for purchasing transport services are; trust (safety of delivery) and reliability/predictability; flexibility and

responsiveness; costs; ability to purchase a complete and tailored service; meeting Key Performance Indicators (KPIs) - as shown in the following example with Nike, and reducing end to end network time (Van Landeghem and Persoons, 2001).

As an example of current State for the Art in relation to decision making and key selling arguments, Menlo Logistics participated in selection of the ideal site from which Nike could serve all of Europe, along with the Middle East and Africa — a total market of some 4,000 retail customers. The winner was the town of Eersel in the Netherlands, about 10 km west of Eindhoven. The warehouse was built from the ground up and designed to Nike specifications by Menlo's own logistics engineering group. Menlo coordinates all inbound and outbound traffic, custom clearance, and provides value adding services on behalf of Nike. It monitors all movements of cargo and reports back to Nike on the various carriers' performance. The measurements are eventually compared with pre-determined benchmarks. Finally, the location of the distribution centre allows Nike to reach a number of important clients within a two-hour time frame (www.glscs.com).

Another example is RODER, a company owned by Turkish lorry operators, using RoRo vessels to transport unaccompanied trailers between Turkey and northern Italy and Russia, to avoid having to drive through the countries of former Yugoslavia (the RODER services were established when the disturbances in the Balkan region were intensive) . One of its main objectives is to co-operate with other domestic and international associations operating in the transport sector to provide services that compete with direct road transport. A mechanism to achieve this is to share all kinds of information and enlighten clients and others about the importance and advantages of Regular RoRo and combined transport activities (www.roder.org.tr).

Having interviewed Procter & Gamble (P&G) on their decision making process used to evaluate if a possible transport solution can be adopted, we found out that the pre-screening requirements are:

- delivery time from productions - distributions to final customers within 24 or 48 hours (depending on the goods)
- time windows to be met (e.g. delivery of the goods when the customer is open)
- reliability (e.g. track and tracing)

If these three requirements are ensured, the following other criteria are used to choose a transport logistics solution:

- technical specifications of the transport operator to be matched with the specifics of the company
- cost

The examples of P&G and Nike have been made intentionally as they represent major actors in the international market. Furthermore it should be noted that the changes in the location of productions and distributions of major producers impact the overall transport network in Europe in terms of new transport solutions to be adopted.

It is therefore important to stress that the majority of the other operators might have different selection criteria to be used to identify and chose a possible transport solution. Usually smaller shippers (in terms of geographical coverage, size and market share) tend to be more 'sensitive' to different variables, like cultural behaviour (e.g. they have used prevalently road, why to change it now?).

Table 1 indicated the various criteria for purchasing transport services (3 most important 1 least important) across a categorisation of shippers by their size in terms of market share.

**Table 1 Criteria for purchasing transport services**

| **Size Company (e.g. in terms of market share)** | **Small** | **Medium** | **Large** |
|---|---|---|---|
| Modal Drivers | | | |
| Reliability (e.g. track and tracing) | 2 | 2 | 3 |
| Delivery time | 2 | 3 | 3 |
| Time Windows | 1 | 2 | 3 |
| Cost | 3 | 3 | 2 |
| Technical Specifications | 1 | 2 | 2 |
| Culture | 3 | 2 | 1 |

Source: Own Elaborations

The research actions of REALISE provided extensive coverage of price comparisons and costs analysis of door to door, single mode and multi-modal logistics chains along actual European transport routes. In the majority of cases the comparisons showed that, on quoted prices and on contractual prices, where comparisons were possible, multi-modal chains involving short sea legs were lower in price than equivalent road-only chains. The definitive conclusion is that, in general and on many actual routes, multi-modal logistics chains, including short sea legs, are lower priced than equivalent road-only chains. Nevertheless, the increase of congestion in container ports and connections affect the reliability and sometimes force operators to use road transport rather than an intermodal transport solution. This can be seen when comparing SSS and road along the same segment and then analysing the performance at the terminal. SSS is very competitive in terms of cost, time and environment on the journey leg, but its performance worsens at the terminal when cargo must be unloaded and loaded to another transport mode (i.e. road) to be able to reach the final destination point. A detailed research of the main problems at terminals has been carried out in the study Integrated Services in the Intermodal Chain[2] (Annex V, 2005).

Figure 9 and Table 2 present the performance across transport modes available along an Origin-Destination (O-D) pair, calculated from the findings of REALISE.

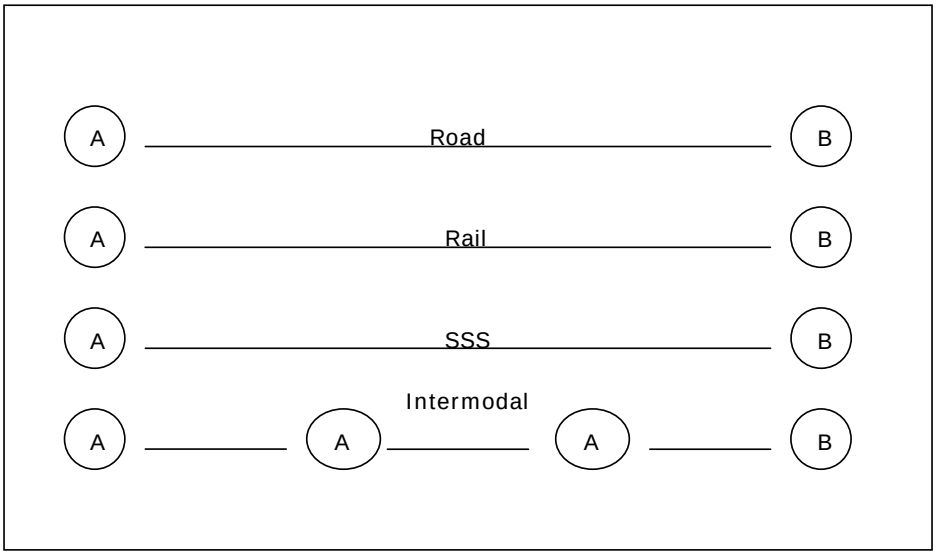



**Figure 9 Single- vs. multimodal transport**

[2] Integrated Services in the Intermodal Chain (ISIC). Project funded by DG TREN under the Freight Integrator Action Plan

**Table 2 Comparing single- and multimodal transport**

| Transport Mode Performance | Road | Rail | SSS | Intermodal |
|---|---|---|---|---|
| | | | | |
| Reliability (e.g. track and tracing) | 2 | 1 | 3 | 2 |
| Delivery time | 3 | 1 | 2 | 2 |
| Time Windows | 2 | 1 | 3 | 2 |
| Cost | 2 | 1 | 3 | 3 |
| Environmental | 2 | 3 | 3 | 3 |

Source: Own Elaboration from REALISE

**Requirements from the Intermodal Transport Users**

The section provides an overview of the main requirements of intermodal transport users, related to the issues highlighted in the previous sections.

*Infrastructure*

Because of the pressure on road freight from increasing costs, stricter new regulations, higher fuel prices, greater congestion and pressures at ports from performance and capacity constraints (fleet is increasing year by year in terms of number and size), transport infrastructure, both in ports and in the hinterland connections, requires urgent investment in order to cope with increasing freight volumes and to facilitate intermodal transport.

"Shippers believe that an efficient, complete and interoperable transport system is of utmost importance to reap the benefits from further market integration, enlargement and international trade liberalisation; hence the importance of investing in Trans European Transport Networks. However, transport infrastructure alone is not enough, European business needs well-functioning and competitive transport services to operate on that infrastructure. " (Filip Beckers, Chairman ESC Maritime Transport Council).

*Motorways of the Sea*

Maritime Transport needs to become an intermodal door-to-door concept that is able to attract large cargo volumes. Many efforts have been made to find solutions for the existing bottlenecks: less administrative burdens, abolition [reduction?] of customs procedures and more efficient inspections.

As indicated by REALISE, Short Sea Shipping's performance in terms of costs, environmental impact and reliability is very satisfactory for the industry needs, but loses out, compared to an all road transport solution, at ports when the sea leg must be connected to another mode in order to reach the final 'door'.

Motorways of the Sea could add further options to service providers, but these services must be above all attractive to shippers and developed on a commercial basis. Demand for such services must be assessed correctly before infrastructure or other investments are made. Identifying where short sea shipping can act as a congestion by-pass or a support to particularly congested transport corridors will be an important criterion for success. The Motorway of the Sea approach remains a theoretical concept as long as it is not "bought into" by shippers who need to see the operational benefits for their supply chains.

The Project MOSES on Motorways of the Sea, which started in June 2007, includes activities to facilitate and simplify administrative procedures, actions for the scientific design of the Sea Motorways that achieve a complementary match between intermodal transport and interregional trade, the incorporation of environmental costs, the enhancing, adapting, testing and validating of technologies for the implementation of successful Motorways of the Sea including strategies, scenarios, quality criteria and indicators.

*Open up the Rail Market*

Many believe the rail freight industry is too complex and generally lacks a customer focus and determination to deliver the goods come what may. All these factors, and more, indicate a very real issue that must be addressed by the rail freight service providers if they are to win new freight contracts from existing and new customers. The rail sector needs further incentives and pressure in order to overcome its national orientation and to compete successfully with other modes. While transport volumes (in tonne-kilometres) have been growing on road and Short Sea Shipping in the last few years, the volume carried by rail has been constant[3]. Hence, the rail freight service providers need to convince industry that it can perform well, that it can be reliable, that it can integrate seamlessly into the logistics and supply chain and is cost effective and competitive in order to increase its market share. Customers must justify the freight logistics services they buy on performance first and foremost. With constant pressures on companies to reduce costs, they must also justify their purchases on grounds of cost competitiveness compared with integrating other freight services into the logistics and supply chain.

*Market Access to Port Services:*

The liberalisation of port services is welcomed by shippers, as provides them with the best opportunity yet to improve working practices and operational procedures within European ports, boost the role of ports as transport network hubs and create competition in and between ports. Greater efficiency stimulated by market competition in dockside activities such as cargo handling is essential in facilitating the rapid turnaround of ships in port.

# ICT

## A Strategy for Improving the Use of ICT

Any ICT solution requires maintenance and development to keep up with the evolution of the business and the related legal requirements. This is more easily achieved in a big organisation than in a small one and is easier to do for internal systems than for more or less permanent networks involving a number of organisations. A wide range of generally accepted off-the-peg software would reduce this kind of problems, especially for the SMEs in the business. However, in order for this to happen it is necessary to develop a common understanding of the way that the business is done and to define the information which is exchanged. Such an "interaction infrastructure" would provide a platform for building standardised, interoperable applications and provide services for such applications. Improved market transparency, lower cost for software, easier access to information and better opportunities for networking with other companies would promote a breakthrough of ICT in freight logistics and more specifically for intermodal transport management.

FREIGHTWISE addresses the issue of market transparency and the need to facilitate the building of transport chains. The approach taken in order to promote the use of ICT includes:

[3] ENERGY AND TRANSPORT IN FIGURES 2007, EU Commission statistics

A focus on the information interfaces between the partners in the chain (assuming that internal systems already exist and the conditions at present are too specific for a more standardised approach).

A unified approach to describing the processes and the organisational roles
Respect for the commercial forces driving and at the same time hampering the cooperation in the intermodal chain.

## Opportunities for SMEs provided by a wider use of ICT

The transport chain manager or freight integrator wants to know what the market can offer in relation to his specific needs and he wants to be able to combine the services on offer to an optimal solution and integrate this information in his management system in an easy way. The supplier wants to increase his market reach even if he is a small specialized company. Present portals and centres with data banks for inter-European intermodal suppliers are a start but the information is on an aggregated level. A more precise description of the offer in terms of e.g. capacity for different cargo types, load unit and vessel characteristics, relations served and time schedules would allow a more productive internet based research. A freight integrator looking for a specific service profile could be using sophisticated search mechanisms, but a less computer-able integrator could use an intermediary portal specialised in providing links to suppliers answering to specific profiles for certain business sectors.

The rapid development of ICT is increasing and facilitating communication on a technical level, but there are a number of additional aspects which have to be addressed if the communication along the intermodal chain is to be efficient. One is the need for common definitions and a common architecture; another is the more complex issue of rules for co-operation between the partners in the chain. The lack of common definitions, data dictionaries and architectures is well known, but there are also wider problems related to the applicability, scope, and commercial acceptance of standardisation efforts.

The questions related to co-operation and commercial integration is inherently complex due to the competitive nature of the transport market. Research on Supply Chain Management (which can also be applied to the organization of intermodal transport chains) stresses the need for trust, commitment and collaboration. The need for better integration is often recognized among transport chain partners, but the practical solutions—for example, defining the appropriate degree of openness or elements of risk sharing—are not easy to implement. The sharing of information is a cornerstone of the FREIGHTWISE approach, but it is a contentious issue in many companies.

The need for transparency among the partners in the intermodal chain is has been analysed by Gustafsson. She concludes that transparency is a precondition for making knowledge accessible to all relevant partners, but that it is also seen as a potential threat which requires a clear definition of the respective roles in the business process. This is why building trust is important, which has to be acknowledged when designing both the commercial agreements and the technical solutions.

In order to overcome this hurdle, it is necessary to build a well structured and formalised framework containing both technical and organisational aspects. For this the notion of “interaction infrastructure” has been introduced by Gustafsson. The notion indicates that interaction is not merely a question of being able to communicate from a technical point of view, but also there is a need for commonly agreed definitions, basic principles, rules for co-operation and communication. In parallel to the situation for the physical infrastructure it is important that “someone” takes the responsibility for the interaction infrastructure, facilitates the agreements and also maintains it.

This underlines the need for a common framework architecture that comprehensively covers all elements and processes of an intermodal transport chain, from load units and types of cargo to actors, interchanges, transport services, schedules, messages and documents. This framework architecture would then serve as a reference point for transport management system development, making available generic data models, process specifications and message schemes.

**FREIGHTWISE contribution**

The development of Virtual Transport Services will provide an interesting opportunity to manage information related to the optimisation of the available multimodal resources with the possibility to create new interesting links among different nodes in specific areas if the business view will support the choice. The possibility to simulate the total cost of a chain could be a relevant requirement the users will ask for.

## TRADES, TRAFFIC AND CORRIDORS SCENARIO

### Intermodal Corridors and Foreseen Logistics Development Scenario

*Potential of Intermodal Transport*

A study conducted by NEA[4] investigated the potential of intermodal transport within Europe. It scored the current transport flows via road if it shifted to intermodal transport. Specifically compared were such factors as the availability of intermodal services, frequency, turnaround time, and cost. According to this survey, the biggest potential for intermodal transport within Europe lies in rail transport with as much as 155 million tonnes to be transported additionally. Another 118 million tonnes may be shifted from road to short sea shipping (see Figure 10).

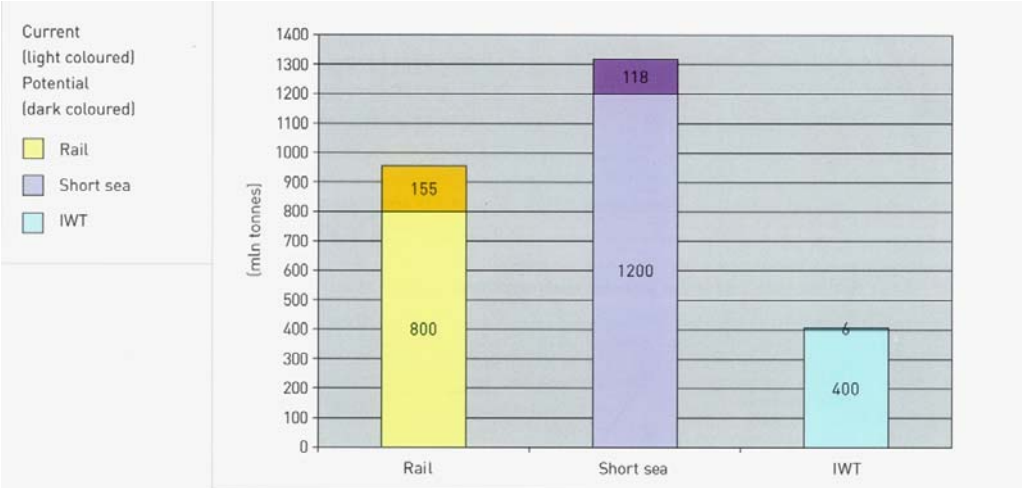



**Figure 10 Potential for "modal shift" with respect to current market position. Source NEA, 2006**

The growth of world trade over the past decades has directly influenced the growth of maritime transport. In the early years of the globalisation process, this involved mainly the transportation of raw materials such as oil and ores. In recent years, the development of containerised transport has become a major component in this growth. The development of containerised cargo has been one of the prime innovations in worldwide logistics, enabling new logistic concepts and providing opportunities for remote emerging countries to connect to the world economy.

Waterborne transport is the main transport mode in the international trade within and with the EU27 plus Norway and Switzerland, with a market share of more than 43%. The shares of road, rail and inland waterways are 30%, 8% and 12% respectively. Inland navigation is mainly concentrated in the Rhine-Scheldt area, where its share is around 20%. The share of rail is high in Eastern Europe, Switzerland and France. The developments of the modal shares up to the year 2020 in Eastern Europe are expected to differ from the developments in Western Europe; while rail is expected to lose some of its high market share in Eastern Europe; it is expected to increase its share slightly in Western Europe. The opposite development is expected with respect to road transport. Figure 11 illustrates the expected modal split for all cargo in international transport intra-Europe (i.e. transport between European countries) 2004 and 2020, as described above.

[4] NEA et al: Freight Flows in an enlarging Europe – From Facts to Visuals, October 2006

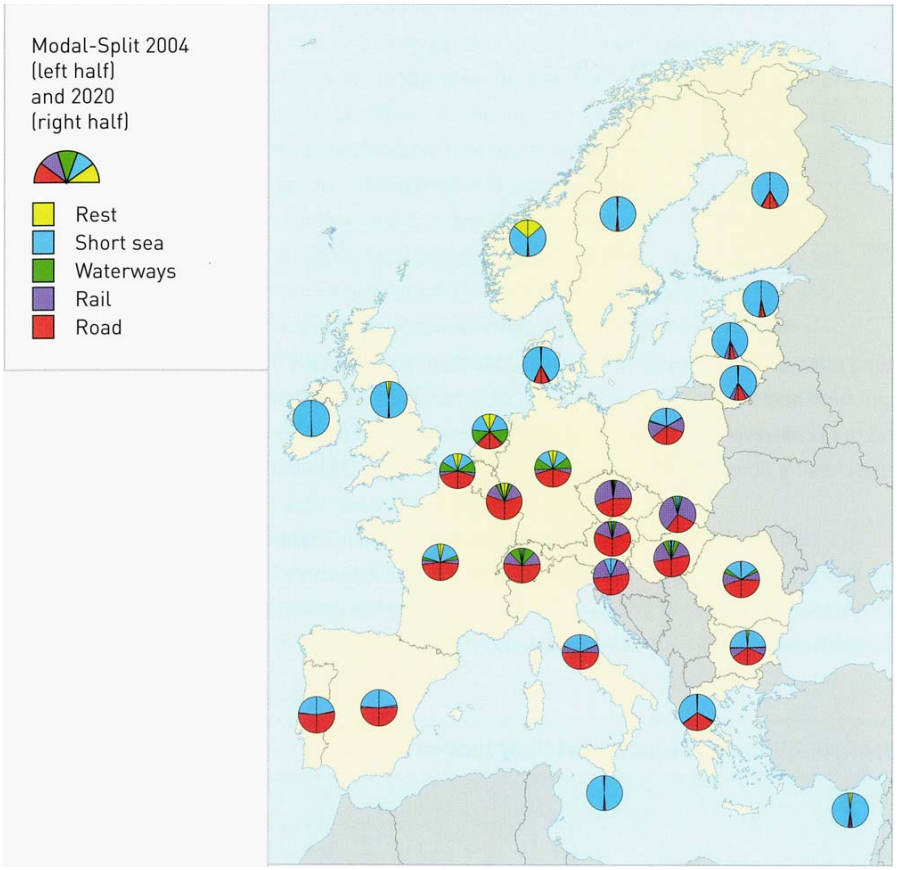



**Figure 11 Modal-split international transport intra-Europe 2004 and 2020. Source NEA, 2006**

*Definition of Corridors*

In the European Commission's Transport White Paper (2001), it was proposed to revise the trans-European network guidelines in order to eliminate bottlenecks by encouraging corridors with priority for freight. The idea was to concentrate on a primary network made up of the most important infrastructure for international traffic and cohesion on the European continent.

The trans-European network will also be expected to form part of an environmentally sustainable policy, which should '*tackle rising levels of congestion and encourage the use of environment-friendly modes of transport*'. To this end, Community action must be redirected to allow for the development of multimodal corridors, giving priority to freight and a high-speed network for passengers. The most important of these European routes will also need to be provided with traffic management plans to make better use of existing capacity.

The concept of transport corridors is marked by a concentration of freight traffic between major hubs and by relatively long distances of transport. Along these corridors industry will be encouraged to rely on co-modality and on advanced technology in order to accommodate rising traffic volumes while promoting environmental sustainability and energy efficiency. According to the Commission's Freight Transport Logistics Action Plan (2007), green transport corridors will reflect an integrated transport concept where short sea shipping, rail, inland waterways and road complement each other to enable the choice of environmentally friendly transport. They will be equipped with adequate transhipment facilities at strategic locations (such as sea ports, inland ports, marshalling yards and other relevant logistic

terminal and installations) and with supply points initially for bio-fuels and, later on, other forms of green propulsion.

There is no precise definition of a corridor in Europe or in other parts of the world. However the corridor concept has often been utilised in order to point to a major concentration of traffic flows in the transport network. Since then the concept has been adopted and the definition of European transport corridors has been used in order to prioritise European policy actions. The definition of 9, later 10 priority corridors in Central Europe after the Crete and Helsinki pan-European conferences has been central in the implementation of the Common Transport Policy towards new Member States and these corridors are now the backbone of the extension of the TEN network.

The definition of EU corridors is driven by two major and often overlapping sets of criteria:

- Demand-driven criteria in the sense that corridor concentrates international transport demand
- Institutionally-driven criteria in the sense that corridors are recognised as priority routes by European and national public institutions.

A corridor can be defined as consisting of a number of links and segments for a particular transport mode (e.g. road links for truck transports), which connect the starting and the ending point of a corridor. Transport nodes (e.g. cities, junctions) or transfer points (e.g. terminals, ports) are connected by a number of links, which are defined for different types of transport modes (rail, road, inland waterway) and are used for distributing trade volumes among the EU27 countries and their regions. Main corridors can be defined as a number of particular segments, which are "unidirectional" (e.g. north-south or east-west) of the main links (which attract the highest transport volumes). However, some research projects, such as the ISIC project, have defined corridors in different ways.

*Identification of Corridors*

The identification of the pan-European corridors with the highest intermodal potential was considered by the ISIC project. The methodological approach used for identifying the most promising transport corridors, for the implementation of the corridor-based Intermodal Development Centres (IDCs), is described below:

1. A corridor definition based on political priorities at national and European levels

2. A corridor definition by transport volumes to define the relevant potential intermodal transport corridors is provided (via different studies and methods)

    - Results from the study TEN Stac
    - Results from the study Intermodal
    - Simulations and path analyses with the BMT-TS "EFM STAN" freight flow model, which is able to derive transport flows from regional trade volumes

3. An identification of corridors with already high intermodal volumes (including short sea shipping) through

    - Actual reported intermodal rail volumes from the UIC study and recent UIRR statistics
    - Actual reported SSS volumes from the Integrations project

The purpose of the above exercise was to exclude all previously identified high transport volume corridors, which already show a satisfactory intermodal supply. It was also to estimate the level of recent intermodal supply, so that the overall non-bulk trade volumes could be related to reported intermodal goods flows, on a country by country comparison.

4. Finally, an identification of the most promising corridors for intermodal transport was undertaken. The most promising corridors for intermodal transport in Europe will be those with the highest international transport demand and relatively low supply of intermodal transport, while having a considerable trade volume in the background.

*Existing and New Corridors*

Current Corridors

Current intermodal corridors were given in the UIC Study on capacity reserve for combined transport by MVA, Kessel und Partner and Kombi Konsult.

This study did not publish confidential classified data of recent intermodal transport volumes on major corridors. However, major links on the intermodal networks were illustrated; see Figure 12. The figures (from the UIC report), given in Table 3, indicates that the total increase is 62,5 million tonnes a major part of which is related to the unaccompanied traffic.

**Table 3 International combined transport 2002/2015**

| Market segment | TEU (mill) | | Net tonnage (mill tonnes) | | |
|---|---|---|---|---|---|
| | 2002 | 2015 | 2002 | 2015 | 2015/2002 |
| Unaccompanied | 3.48 | 8.7 | 44.1 | 103.6 | + 135 % |
| Accompanied | 1.26 | 1.5 | 10.4 | 12.4 | + 19 % |
| **Total** | **4.74** | **10.2** | **54.5** | **116.0** | **+ 113 %** |

Figure 13 illustrates the terminal-to-terminal services for semi-trailers in Europe. Another indication that the intermodal heart of Europe is within the Western European countries is the distribution of large terminals and their growths perspectives. However, there is definitively high potential in Eastern Europe for intermodal transport solutions, provided the infrastructure network (road and rail conditions and connections) improve. The lack of intermodal supply in Eastern Europe is underpinned by the analysis made by the Integration project (Integration of Sea Land Technologies for an efficient intermodal door to door transport, 5th framework programme, DG Research), which highlights the scope for an increasing East European market.

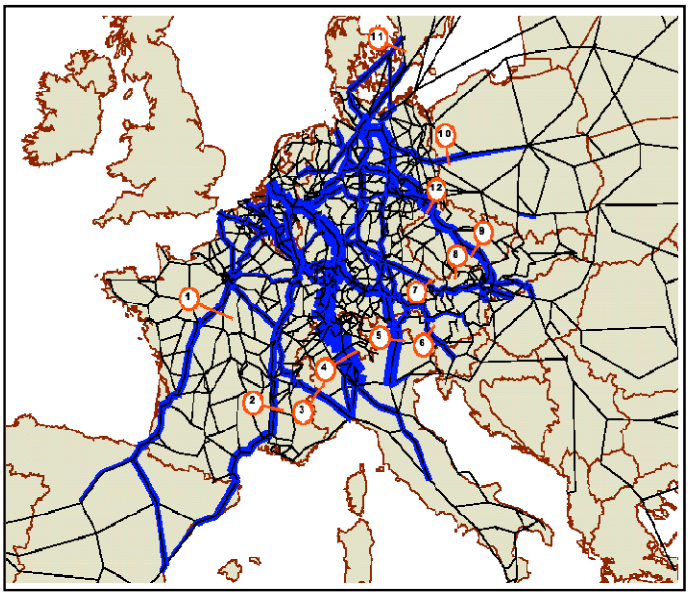


**Figure 12 Simulated major intermodal transport corridors for the time horizon 2015 representing 95% of all intermodal volumes in Europe (road-rail). Source: UIC Study on capacity reserve for combined transport by MVA, 2004**


**Figure 13 Semi-trailer flows north to south 2000. Source: SAIL-project**

**Table 4 Intermodal saturation index rail intermodal, in red the very low figures point at a weak intermodal supply**

| | Italy | Germany | Switzer-land | Austria | Czech Rep. | Sweden | Hungary | Poland |
|---|---|---|---|---|---|---|---|---|
| Italy | - | 27 | 10 | 4 | 1 | 23 | 1 | 5 |
| Germany | 22 | - | 7 | 4 | 12 | 13 | 22 | 7 |
| Switzerland | 15 | 12 | - | 1 | 0 | 37 | 0 | 0 |
| Austria | 2 | 6 | 0 | - | 0 | 0 | 2 | 0 |
| Czech Rep. | 1 | 9 | 0 | 1 | - | 0 | 1 | 0 |
| Sweden | 10 | 10 | 12 | 0 | 0 | - | 0 | 0 |
| Hungary | 1 | 13 | 0 | 8 | 2 | 0 | - | 0 |
| Poland | 6 | 4 | 0 | 0 | 0 | 0 | 0 | - |
| Slovenia | 1 | 3 | 0 | 10 | 0 | 0 | 46 | 0 |
| Denmark | 27 | 3 | 20 | 0 | 0 | 0 | 0 | 0 |

Establishing the saturation index on a county-by-country basis may sound as a very crude approach, but it indicates the relations with very low shares of intermodal transport that should be in the focus for promotion and development.

The main intermodal terminals and their growth perspective until 2015 are illustrated in Figure 14.

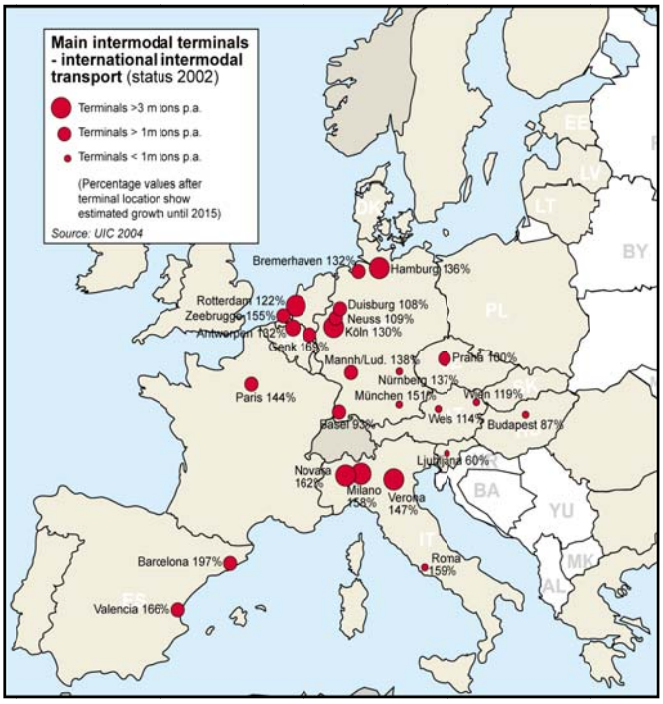



**Figure 14 Main intermodal terminals and their growth perspective, until 2015. Sources: Map: BMT-TS 2004, Data UIC 2002**

Potential New Corridors

The proposed pan European corridors (always meant in both directions) with the largest intermodal potential[5], while having at the same time:

- a low intermodal supply saturation index and
- a high bilateral non-bulk goods flows

are given below and illustrated in Figure 15.

A comparison of different corridor sources and identifications is given in Annex1.

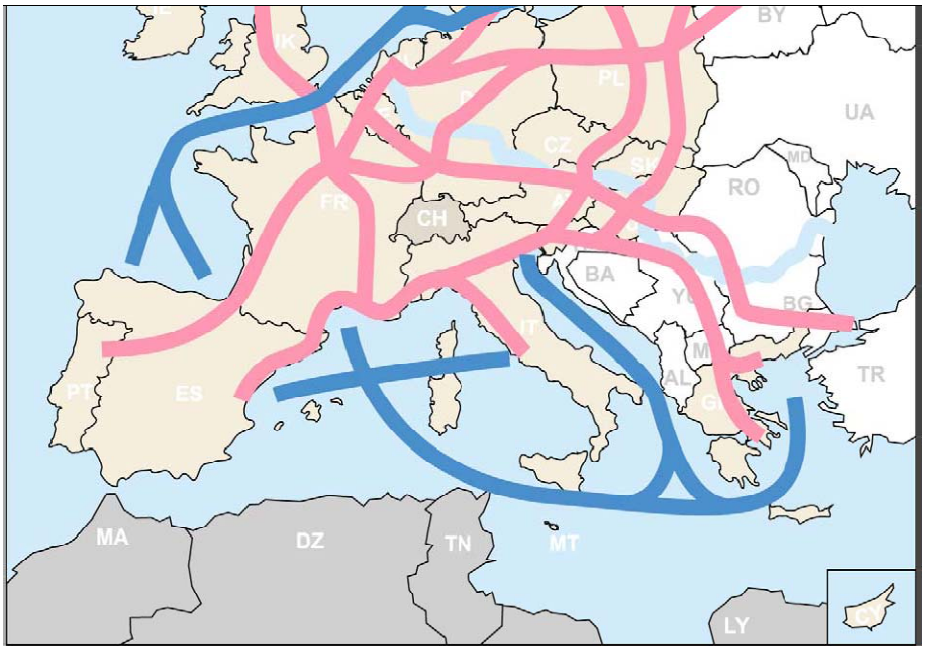



**Figure 15 Proposed pan European corridors with the largest intermodal potential. Source ISIC Study 2005**

**Road/ Rail**

- Spain - France – Benelux/Germany - Nordic countries (Denmark, Norway, Sweden, Finland) (via Pyreneans)
- And specifically as very important parts of it
  - Benelux - Germany
  - Germany - France
  - Benelux - France
- UK - Benelux - Germany - Poland – Belarus/ Lithuania - Russia
- Germany - Austria - Hungary- Romania (Slovenia – Croatia - Yugoslavia, Macedonia ) - Bulgaria– Greece/Turkey
- (Portugal) - Spain - Italy
- Italy - Slovenia – Croatia - Hungary – Slovakia - Poland
- Norway/Sweden - Poland - Czech Rep/Slovak Republic, Austria, Slovenia
- (Scotland) - England – France

[5] From the ISIC study

- Austria – Czech Rep /Slovakia - Poland– Lithuania – Latvia – Estonia – Russia (St. Petersburg)
- Austria - Czech Rep /Slovakia – Poland - Belarus - Russia (Moscow)

**Inland Waterway**

- Rhine – Main – Danube corridor: Benelux - Germany - Austria - Hungary - Yugoslavia – Romania

**Short Sea Shipping**

- Spain - France - Benelux/ Northern Germany (via Atlantic Arc and Channel)
- Spain – Italy
- Benelux – Germany/Denmark - Lithuania/Latvia/Estonia - Russia
- Turkey/ Greece- France /Italy

*Trade Data for European Corridors*

Trade data for the European corridors listed in Annex 1 are given in Annex 2, based on Euro Stats 2005 and translated by Transmodal (see for further detail section 5 of this report). The data is for international trade, and exclude data for corridors which are purely domestic. The outputs are in tonnes, unitised tonnes and TEU by direction, with the imports and exports shown separately.

An example of the trade data for a specific corridor is given in Table 5 for the corridor Hamburg - Ruhr - Lyon - Marseille - Northern Spain.

**Table 5 Trade data on a specific European Corridor. Source Transmodal 2005**

| Matrix | Tonnes | Hamburg | Ruhr | Lyon | Marseille | Northern Spain |
|---|---|---|---|---|---|---|
| Hamburg | Hamburg | | | 22,978 | 6,405 | 58,564 |
| Nordrhein-Westfalen | Ruhr | | | 416,985 | 81,085 | 740,612 |
| Rhône-Alpes | Lyon | 47,212 | 266,953 | | | 572,767 |
| Provence-Alpes-Côte d'Azur | Marseille | 182,846 | 322,182 | | | 840,426 |
| Galicia, Asturias, Cantabria, Pais Vasco, Navarra, La Rioja, Castilla Y Leon | Northern Spain | 21,335 | 729,127 | 370,478 | 148,358 | |

| Unitised Tonnes | Hamburg | Ruhr | Lyon | Marseille | Northern Spain |
|---|---|---|---|---|---|
| Hamburg | | | 18,772 | 5,164 | 33,232 |
| Ruhr | | | 262,551 | 59,785 | 504,122 |
| Lyon | 42,112 | 208,670 | | | 201,193 |
| Marseille | 17,471 | 88,884 | | | 242,620 |
| Northern Spain | 10,915 | 546,917 | 229,176 | 100,499 | |

| TEU | Hamburg | Ruhr | Lyon | Marseille | Northern Spain |
|---|---|---|---|---|---|
| Hamburg | | | 2,601 | 569 | 2,867 |
| Ruhr | | | 34,502 | 7,205 | 64,561 |
| Lyon | 7,113 | 33,137 | | | 24,143 |
| Marseille | 1,411 | 9,059 | | | 23,896 |
| Northern Spain | 1,584 | 74,618 | 30,424 | 11,227 | |

**The Role of Logistics in Europe for the Future Development of Trade and Transport Flows**

*Transport Growth – Trends for Intermodality*

In the period 1995–2004 the growth of goods transport within the EU increased at a rate of 2.8% per year. Goods transport grew by 28 % with transport by road growing by 35 %, short sea shipping grew at almost the same rate, and rail freight transport grew by 6 %.

For the period between 2000 and 2020, freight transport is expected to grow by 50 % for the whole period, at roughly similar rates to the forecast annual GDP growth rate of 2.1 % (52 % for the whole period); see Table 6 and Figure 16.

**Table 6 Projections of transport volumes and modal share – key trends foreseen as a baseline.**

| Most likely 2000–20 transport activity growth in the EU-25 (%) | |
|---|---|
| GDP | 52 |
| Overall freight transport | 50 |
| Overall passenger transport | 35 |
| Road freight transport | 55 |
| Rail freight transport | 13 |
| Short sea shipping | 59 |
| Inland navigation | 28 |
| Private car | 36 |
| Rail passenger transport | 19 |
| Air transport | 100 |

Source: http://ec.europa.eu/transport/transport_policy_review/index_en.htm

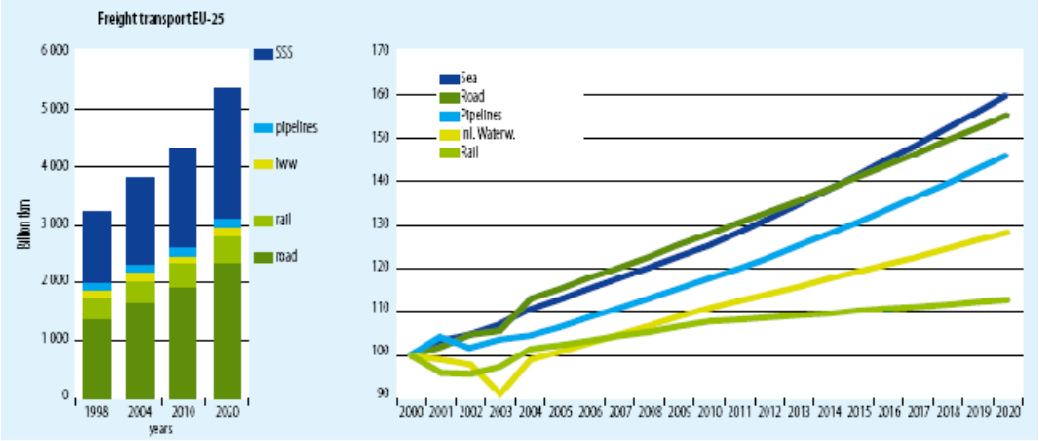



**Figure 16 Expected growth in freight transport activity (2000=100). Source: as above.**

*Multimodal transport*

Analysing the available data about freight villages and ports in the Mediterranean area, it is not easy to find useful data for analysing the future development. The final report of a study on "Infrastructure Capacity Reserves For Combined Transport By 2015", prepared for the International Union of Railways Combined Transport Group (UIC-GTC), and presented in

Freiburg/Frankfurt and Main/Paris in May 2004, reported on the growth rate for combined transport 2000/2015; see Table 7.

**Table 7 Prognosis of average annual growth rates of tonne-kilometres 2000/2015 (%)**

| Country | All modes | Rail | Road | CT 2015 |
|---|---|---|---|---|
| Austria | 2.4 | 2.7 | 2.5 | 3.2 |
| Belgium | 2.5 | 1.6 | 2.8 | 3.5 |
| Czech Republic | 1.6 | -0,9 | 2.4 | 2.9 |
| Denmark | 2.0 | 1.5 | 2.0 | 2.5 |
| Estonia | 3.1 | 2.2 | 7.0 | 3.6 |
| Finland | 1.6 | 2.8 | 1.2 | 3.3 |
| France | 2.0 | 2.6 | 2.2 | 3.1 |
| Germany | 2.3 | 1.8 | 2.5 | 3.5 |
| Hungary | 2.5 | 0.9 | 3.0 | 3.5 |
| Italy | 2.3 | 3.5 | 2.2 | 4.0 |
| Luxembourg | 2.7 | 2.2 | 2.9 | 3.5 |
| Netherlands | 2.6 | 4.0 | 2.3 | 4.5 |
| Norway | 3.0 | 2.1 | 3.1 | 3.6 |
| Poland | 2.2 | -2,7 | 4.5 | 5.0 |
| Portugal | 2.9 | 5.3 | 2.5 | 5.8 |
| Spain | 3.3. | 4.6 | 3.2 | 5.1 |
| Sweden | 3.2 | 2.2 | 3.8 | 4.3 |
| Switzerland | 2.6 | 2.1 | 2.8 | 3.5 |
| UK | 2.6 | 3.1 | 2.5 | 3.0 |

Table 8 shows transport volumes and capacities in selected European intermodal terminals.

**Table 8 Transhipment Volume and Capacity [in LU] and Rate of Employment [in %] by Selected Terminal Area**

| Country | Transport Area | N. of terminals | Transhipment volume in 2002 | | | 2002 handling capacity | Rate of employment |
|---|---|---|---|---|---|---|---|
| | | | Total | National | International | | |
| AT | Graz | 1 | 50.000 | 9.000 | 41.000 | 130.000 | 38% |
| | Villach | 1 | 51.289 | 6.668 | 44.621 | 70.000 | 73% |
| | Wels | 1 | 102.815 | 33.929 | 68.886 | 132.000 | 78% |
| | Wien | 2 | 152.115 | 42.394 | 109.721 | 175.000 | 87% |
| BE | Antwerpen | 4 | 356.700 | 161.700 | 195.000 | 610.000 | 58% |
| | Genk | 2 | 57.842 | 2.889 | 54.953 | 69.000 | 84% |
| | Zeebrugge | 1 | 126.693 | | 120.000 | 365.000 | 35% |
| CH | Basel | 2 | 155.274 | 67.527 | 87.746 | 195.000 | 80% |
| CZ | Praha | 2 | 148.600 | 9.600 | 139.000 | 250.000 | 59% |
| DE | Bremen/Bremerhav | 2 | 542.000 | 337.200 | 204.800 | 760.000 | 71% |
| | Duisburg | 2 | 107.500 | 53.500 | 54.000 | 208.000 | 52% |
| | Hamburg | 5 | 969.231 | 582.066 | 271.165 | 1.200.000 | 81% |
| | Koeln | 1 | 265.745 | 72.466 | 193.279 | 237.000 | 112% |
| | Luebeck | 1 | 42.500 | 0 | 42.500 | 140.000 | 30% |
| | Muenchen | 1 | 200.000 | 144.000 | 56.000 | 320.000 | 63% |
| | Neuss | 1 | 75.092 | 9.847 | 65.245 | 140.000 | 54% |
| | Nu?rnberg | 2 | 118.800 | 63.800 | 55.000 | 150.000 | 79% |
| | Mannheim/Ludwigsl | 2 | 260.752 | 129.910 | 130.842 | 254.000 | 103% |
| DK | Taulov | 1 | 75.000 | 25.000 | 50.000 | 80.000 | 94% |
| ES | Barcelona | 3 | 163.000 | 87.000 | 76.000 | 314.000 | 52% |
| | Madrid | 1 | 100.000 | 80.000 | 20.000 | 192.000 | 52% |
| | Valencia | 2 | 105.000 | 43.000 | 92.000 | 240.000 | 44% |
| FR | Le Havre | 2 | 108.946 | 95.500 | 13.446 | 34.000 | (a) |
| | Paris | 6 | 176.282 | 110.837 | 65.445 | 658.000 | 27% |
| HU | Budapest | 2 | 140.000 | | 140.000 | 210.000 | 67% |
| IT | Bologna | 1 | 93.585 | 49.600 | 44.000 | 220.000 | 43% |
| | Milano | 9 | 488.002 | 81.462 | 406.540 | 801.000 | 61% |
| | Novara | 3 | 182.625 | 750 | 181.875 | 315.000 | 58% |
| | Verona | 2 | 223.796 | 1.043 | 222.753 | 329.000 | 68% |
| NL | Rotterdam | 2 | 516.000 | 125.000 | 391.000 | 600.000 | 86% |
| PL | Gliwice | 1 | 30.000 | | 30.000 | 30.000 | 100% |
| | Poznan | 1 | 27.000 | | 27.000 | 25.000 | 108% |
| | Warszawa | 1 | 40.000 | | 40.000 | 60.000 | 67% |
| SI | Ljubljana | 1 | 58.300 | 11.100 | 47.200 | 100.000 | 58% |
| All transport areas | | | 6.310.484 | 2.436.787 | 3.781.018 | 9.613.000 | 66% |

The terminal capacity bottlenecks (gaps) by transport area by 2015 that have been envisaged by the study are reported in Table 9.

**Table 9 Determination of expected "Need" by Terminal Area by 2015**

| Country | Transport area | Capacity 2015 | Total volome 2015 | Rate of employment | Probable capacity gap 2015 |
|---|---|---|---|---|---|
| AT | Graz | 130.000 | 137.000 | 105% | 33.000 |
| | Villach | 110.000 | 121.000 | 110% | 33.000 |
| | Wels | 132.000 | 181.000 | 137% | 75.400 |
| | Wien | 300.000 | 282.000 | 94% | 42.000 |
| BE | Antwerpen | 940.000 | 614.000 | 65% | |
| | Genk | 122.000 | 150.000 | 123% | 52.400 |
| | Zeebrugge | 365.000 | 306.000 | 84% | 14.000 |
| CH | Basel | 390.000 | 238.000 | 61% | |
| CZ | Praha | 200.000 | 288.000 | 144% | 128.000 |
| DE | Bremen/Bremerhaver | 1.060.000 | 813.000 | 77% | |
| | Duisburg | 318.000 | 166.000 | 52% | |
| | Hamburg | 1.200.000 | 1.222.000 | 102% | 262.000 |
| | Koeln | 300.000 | 517.000 | 172% | 277.000 |
| | Luebeck | 140.000 | 101.000 | 72% | |
| | Muenchen | 320.000 | 283.000 | 88% | 27.000 |
| | Neuss | 140.000 | 146.000 | 104% | 34.000 |
| | Nu?rnberg | 320.000 | 195.000 | 61% | |
| | Mannheim/Ludwigsha | 346.000 | 443.000 | 128% | 166.200 |
| DK | Taulov | 120.000 | 130.000 | 108% | 34.000 |
| ES | Barcelona | 348.000 | 307.000 | 88% | 28.600 |
| | Madrid | 192.000 | 140.000 | 73% | |
| | Valencia | 236.000 | 288.000 | 122% | 99.200 |
| FR | Le Havre | 39.000 | 127.000 | (a) | (a) |
| | Paris | 658.000 | 270.000 | 41% | |
| HU | Budapest | 300.000 | 263.000 | 88% | 23.000 |
| IT | Bologna | 235.000 | 155.000 | 66% | |
| | Milano | 1.057.925 | 1.130.000 | 107% | 283.660 |
| | Novara | 805.000 | 478.000 | 59% | |
| | Verona | 780.000 | 551.000 | 71% | |
| NL | Rotterdam | 1.400.000 | 993.000 | 71% | |
| PL | Gliwice | 32.000 | 57.000 | 178% | 31.400 |
| | Poznan | 65.000 | 53.000 | 82% | 1.000 |
| | Warszawa | 60.000 | 79.000 | 132% | 31.000 |
| SI | Ljubljana | 150.000 | 87.000 | 58% | |
| Total terminals | | 13.271.925 | 11.184.000 | 84% | |

Table 10 reports about the Top 25 transport areas by 2015 for international combined transport.

**Table 10 Top 25 transport areas by 2015 for international combined transport**

| N° | Transport area | Export [1,000 t] | | Import [1,000 t] | | Growth rate | |
|---|---|---|---|---|---|---|---|
| | | 2002 | 2015 | 2002 | 2015 | 2015/2002 | p.a. |
| 1 | Milano | 4.402 | 11.477 | 4.908 | 12.566 | 158% | 7,60% |
| 2 | Rotterdam | 3.176 | 6.960 | 3.450 | 7.717 | 122% | 6,30% |
| 3 | Ko?ln | 3.338 | 7.811 | 2.184 | 4.870 | 130% | 6,60% |
| 4 | Verona | 2.123 | 5.225 | 2.642 | 6.522 | 147% | 7,20% |
| 5 | Antwerpen | 2.574 | 6.355 | 2.283 | 4.934 | 132% | 6,70% |
| 6 | Hamburg | 2.384 | 6.335 | 2.241 | 4.585 | 136% | 6,80% |
| 7 | Novara | 1.677 | 4.382 | 2.238 | 5.862 | 162% | 7,70% |
| 8 | Praha | 1.141 | 2.277 | 1.288 | 2.580 | 100% | 5,50% |
| 9 | Mannheim/Ludwigshafe | 1.279 | 3.070 | 646 | 1.521 | 138% | 6,90% |
| 10 | Zeebru?gge | 953 | 2.441 | 730 | 1.849 | 155% | 7,50% |
| 11 | Paris | 830 | 2.004 | 759 | 1.866 | 144% | 7,10% |
| 12 | Basel | 982 | 1.923 | 978 | 1.863 | 93% | 5,20% |
| 13 | Barcelona | 517 | 1.460 | 662 | 2.047 | 197% | 8,70% |
| 14 | Valencia | 558 | 1.328 | 587 | 1.714 | 166% | 7,80% |
| 15 | Genk | 663 | 1.769 | 449 | 1.217 | 169% | 7,90% |
| 16 | Nu?rnberg | 602 | 1.436 | 551 | 1.297 | 137% | 6,90% |
| 17 | Neuss | 710 | 1.500 | 529 | 1.084 | 109% | 5,80% |
| 18 | Bremen/Bremerhaven | 623 | 1.643 | 463 | 874 | 132% | 6,70% |
| 19 | Roma | 301 | 781 | 586 | 1.519 | 159% | 7,60% |
| 20 | Mu?nchen | 479 | 1.200 | 395 | 989 | 151% | 7,30% |
| 21 | Duisburg | 605 | 1.275 | 440 | 894 | 108% | 5,80% |
| 22 | Wien | 311 | 678 | 623 | 1.370 | 119% | 6,20% |
| 23 | Wels | 379 | 795 | 495 | 1.073 | 114% | 6,00% |
| 24 | Budapest | 408 | 749 | 553 | 1.051 | 87% | 4,90% |
| 25 | Ljubljana | 466 | 736 | 518 | 840 | 60% | 3,70% |
| **Subtotal 1.-25. (~72%)** | | 31.480 | 75.609 | 31.196 | 72.706 | 137% | 6,90% |
| **Other transport areas** | | 12.391 | 28.017 | 12.549 | 28.794 | 126% | 6,50% |
| **Total volume** | | 43.870 | 103.626 | 43.744 | 101.499 | 134% | 6,80% |

Source: Study on Infrastructure Capacity Reserves for Combined Transport by 2015; International Union of Railways Combined Transport Group

**Table 11 Determination of Transhipment Volume [in LU] by 2015**

| Country | Transport area | Transshipment volume 2002 | | 2015/2002 | 2015 total |
|---|---|---|---|---|---|
| | | National | International | international traffic | volume |
| AT | Graz | 9.000 | 41.000 | 212% | 137.000 |
| | Villach | 6.668 | 44.621 | 157% | 121.000 |
| | Wels | 33.929 | 68.886 | 114% | 181.000 |
| | Wien | 42.394 | 109.721 | 119% | 282.000 |
| BE | Antwerpen | 161.700 | 195.000 | 132% | 614.000 |
| | Genk | 2.889 | 54.953 | 168% | 150.000 |
| | Zeebrugge | | 120.000 | 155% | 306.000 |
| CH | Basel | 67.527 | 87.746 | 94% | 238.000 |
| CZ | Praha | 9.600 | 139.000 | 100% | 288.000 |
| DE | Bremen/Bremerhaven | 337.200 | 204.800 | 139% | 813.000 |
| | Duisburg | 53.500 | 54.000 | 108% | 166.000 |
| | Hamburg | 582.066 | 271.165 | 136% | 1.222.000 |
| | Koeln | 72.466 | 193.279 | 130% | 517.000 |
| | Luebeck | 0 | 42.500 | 138% | 101.000 |
| | Muenchen | 144.000 | 56.000 | 149% | 283.000 |
| | Neuss | 9.847 | 65.245 | 109% | 146.000 |
| | Nu?rnberg | 63.800 | 55.000 | 138% | 195.000 |
| | Mannheim/Ludwigshafen | 129.910 | 130.842 | 139% | 443.000 |
| DK | Taulov | 25.000 | 50.000 | 109% | 130.000 |
| ES | Barcelona | 87.000 | 76.000 | 189% | 307.000 |
| | Madrid | 80.000 | 20.000 | 200% | 140.000 |
| | Valencia | 43.000 | 92.000 | 166% | 288.000 |
| FR | Le Havre | 95.500 | 13.446 | 132% | 127.000 |
| | Paris | 110.837 | 65.445 | 144% | 270.000 |
| HU | Budapest | | 140.000 | 88% | 263.000 |
| IT | Bologna | 49.600 | 44.000 | 140% | 155.000 |
| | Milano | 81.462 | 406.540 | 158% | 1.130.000 |
| | Novara | 750 | 181.875 | 162% | 478.000 |
| | Verona | 1.043 | 222.753 | 147% | 551.000 |
| NL | Rotterdam | 125.000 | 391.000 | 122% | 993.000 |
| PL | Gliwice | | 30.000 | 90% | 57.000 |
| | Poznan | | 27.000 | 98% | 53.000 |
| | Warszawa | | 40.000 | 97% | 79.000 |
| SI | Ljubljana | 11.100 | 47.200 | 60% | 87.000 |
| All transport areas | | 2.499.787 | 3.850.711 | 138% | 11.540.000 |

Source: Same as above

*Development of the European Logistics Market*

In the growing demand for transport services, intermodal transport will become a major player. From a logistics perspective, the most economic mode or combination of modes will always find its way. This has a few implications:

- Not all modes have the same initial framework conditions/the same chances;
- This will not automatically lead to the combination of modes that are least destructive to the environment;
- Interoperability between modes is a crucial factor to ensure 'seamless' transport and ensure a high level of efficiency (lowest possible costs, shortest timeframe)

Ideally there should be a level playing field in which all modes pay for the external costs they create and price tags are comparable The cost of security measures is however, not equal for all modes. It is therefore important that a European common policy ensures that all modes have equal conditions; external costs are internalised for all modes, and that the same conditions apply in all countries.

Intermodal transport requires high quality and very efficient services from all modes; i.e. efficient co-modality. To be competitive, intermodal transport should deliver a high quality service (seamless, fast, and reliable) at the lowest cost. 'Integrated Freight Transport Management Logistic Systems are therefore an essential element required to bring this about.

- Information technology and logistics must be integrated to form the "smart supply chain", embedded in a common EU intermodal, cross-border strategy;
- IT system to control all points in the supply chain (based on harmonised information availability and automated tracking & tracing features), including terminals and transhipment points;
- Methodologies and tools for global repositioning of loading units;
- Co-operation and liabilities between transport operators (service quality, reliability, cargo conditions of carriage, legal, competition and insurance issues, loss and damage issues);
- Harmonisation of document handling and customs procedures, contracting, and permitting;

At this moment the cooperation in European intermodal transport networks, between stakeholders (including shippers), is mostly vertical in a client – supplier relationship. To improve the situation a degree of horizontal network cooperation is required.

*Trends in Service Development*

An important goal of European Transport Policy, as described in the White Paper "Time to Decide" is to increase the share of intermodal transport as a means to make better use of existing transport capacities. However, the mid-term review of the White Paper, states that this goal has not been reached, nor has it been possible to achieve the decoupling of transport development from the economic development.

The mid-term review introduced the term *co-modality* defined as: the efficient use of different modes on their own and in combination, which will result in an optimal and sustainable utilisation of resources, acknowledging that mobility is important to support economic development and the creation of new jobs. In this slightly revised context, the development of intermodal freight transport becomes part of a policy of integrated logistics to be supported by public efforts to promote interoperability through standardisation and other initiatives.

The complexity of the intermodal transport chain in relation to its competitor, direct truck transport from door to door, is illustrated in Figure 17. This figure indicates the FREIGHTWISE approach to developing an efficient management structure, which is considered necessary if intermodal transport shall have a chance to compete.

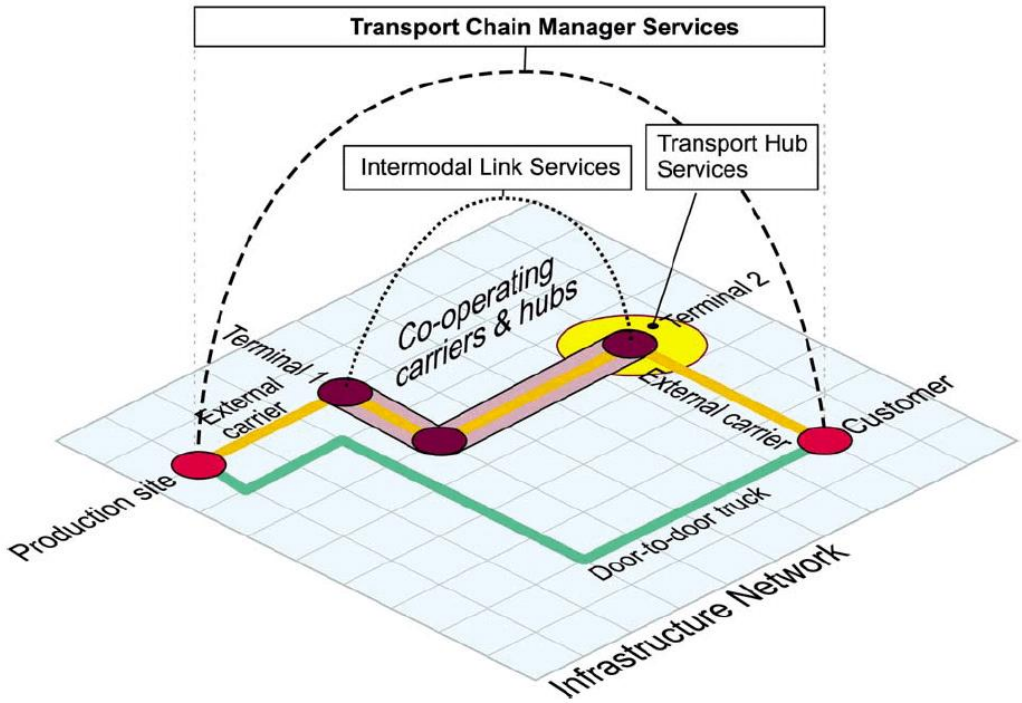



**Figure 17 Intermodal transport versus direct truck transport. Source: Freightwise TA**

There are many commercial, technical and organisational obstacles to overcome in the process of combining a number of transport services to an efficient transport chain. Rapidly changing business and administrative requirements demand a high level of flexibility from the transport industry in terms of the services offered and the related management systems. Integrated transport management also requires a certain level of business integration which demands trust with a potential perspective of long term co-operation. Information access and communication possibilities are key elements in this context.

Business partners must also have the opportunity to communicate with each other and with the authorities. But many companies find the threshold for using advanced Information Technology and IT-based management tools still too high in terms of costs and necessary know-how. Standards are too wide or inadequate and do not support the interaction of all parties involved.

The development of an effective management and IT infrastructure will be needed for setting up, monitoring, and managing intermodal chains. This infrastructure will support the interaction with other service partners in the chain, but also with external actors, such as traffic management services, customs offices, and other relevant public bodies.

The above approach is illustrated in the model below - see Figure 18, which was developed in THEMIS. At the top, there is the shipper or his agent acting as a Transport Chain Manager (TCM) responsible for delivering the cargo from the consignor to the consignee. The TCM can subcontract the management of certain parts of the chain, which is illustrated by S-TCM. On the next level we have the physical transport and the terminal handling of the cargo. The management of the traffic on the infrastructure used for transport is illustrated at the bottom of the figure where different traffic management systems (TMS) are to varying degrees responsible for security and capacity allocation.

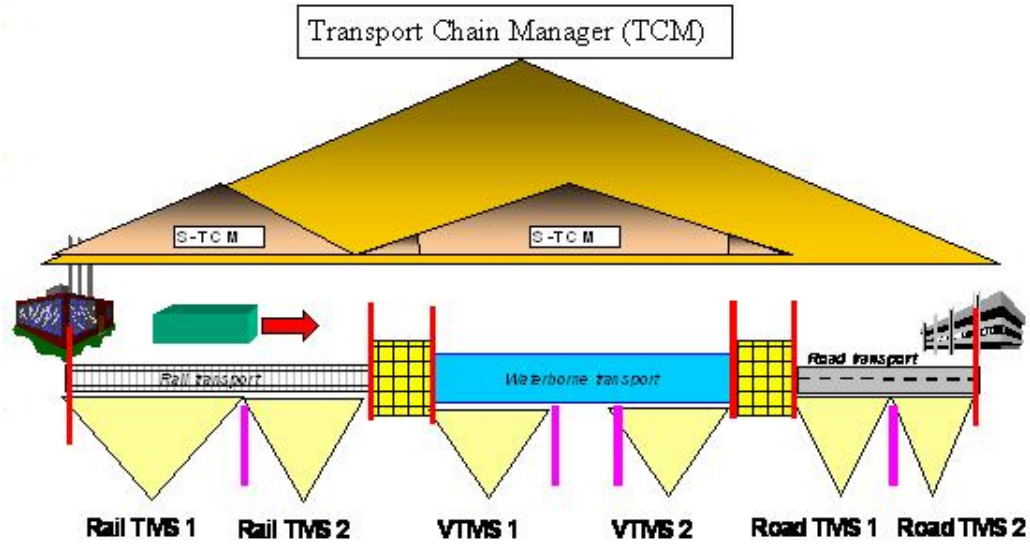



**Figure 18 A model of management responsibilities in an intermodal chain. Source: Themis**

The model does not include asset management, which of course is an important task for the service providers in order to meet the requirements of their ultimate customer - the shipper. The model illustrates the allocation of responsibilities both in terms of physical handling and information. Basically, each partner in the chain has two tasks: to carry out the transport, and to provide information. The latter often builds on information provided by partners upstream

in the chain. Partners are thus not only consumers, but also producers of information. They can improve information quality by adding contextual cues (e.g., by informing on irregularities or by modifying estimates of arrival time).

When considering the information needed to plan and manage intermodal transport in a wider context, it is necessary to include a third domain in addition to predominantly commercial transport management and predominantly public traffic management. By introducing the "institutional" domain, the impact of legislation, regulation and standardization is included.

FREIGHTWISE aims to develop a framework placed at the intersection of the three domains, as illustrated in Figure 19.

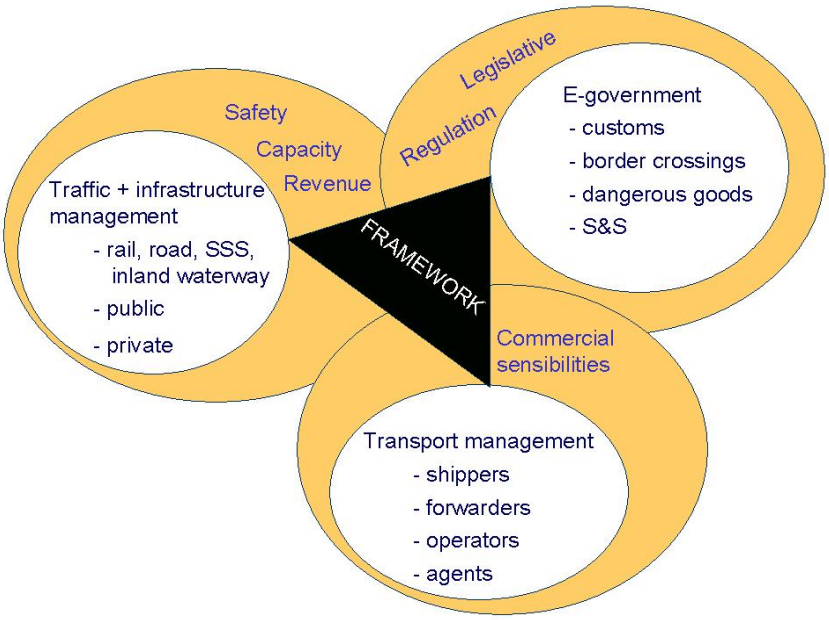



**Figure 19 Three domains governing intermodal transport management.**[6]

The "institutional" domain defines the conditions governing transport and traffic and the use of the infrastructure. The rules provide a framework for interaction. FREIGHTWISE aims to provide input to extend this framework to include additionally rules for interaction and communication in the intermodal chain, which we call "interaction infrastructure". This is in line with the Commission's efforts to support, for example, a harmonized river traffic information system, a technical specification for interoperability in the rail sector and lately, the development of a joint European system for road user charges of heavy vehicles.

[6] Inger Gustafsson: Interaction Infrastructure – A Holistic Approach to Support Co-Modality for Freight, PhD Thesis, Blekinge Institute of technology, 2008

# THE SIZE OF THE POTENTIAL EUROPEAN INTERNATIONAL INTERMODAL MARKET

*Objective & scope*

The ultimate objective of FREIGHTWISE is to improve the management of intermodal freight transport, so that greater use is made of intermodal freight transport chains rather than all-road transport chains. This chapter sets out to answer, in particular, the following question: How big is the European intermodal freight transport market?

The objective of this chapter is therefore to estimate the total size of the potential international intermodal transport market that the FREIGHTWISE project can address. Intermodal transport has been defined as the transport of freight between an origin and a destination in the same unit (container, swap body or trailer) without any handling of the goods, but using more than one mode of transport. This means that the potential intermodal market is all freight that is transported in some form of unit within Europe.

As no consistent pan-European intermodal transport data was available to the FREIGHTWISE consortium in order to size this market, estimated unitised trade data was used as a "proxy". This has the limitation that it only includes movements of unitised freight between Member States of the EU and between Member States and the rest of the world, excluding movements of unitised freight within individual Member States.

The intra-EU27 trade is the subject of many of the Business Cases within FREIGHTWISE and many of the flows are over longer distances, so are particularly economic for intermodal transport. The extra-EU27 unitised trade is likely to have considerable potential for intermodal transport, because much of it arrives at, or departs from, a deep-sea container port. Most of these ports are rail-connected or have inland waterway or maritime feeder connections and the ability to transfer the units from deep sea container vessels to a train, barge or ship at minimal cost provides intermodal transport with a significant economic advantage in this market.

As well as the global statistics on the whole market, a region-to-region origin-destination trade matrix, originally developed for the ETIS FP5 project, was used to estimate region-to-region flows of trade within Europe (e.g. Ile de France to Emilia Romagna) as a resource on which the Business Cases could draw.

At the time the work was carried out, 2005 was the most recent year for which complete and consistent data was available.

*Methodology*

The analysis was completed using the following methodology:

- Country-to-country trade data for all EU27 countries in 2005 was extracted from the MDS Transmodal World Cargo Database, which includes estimates of the amount of unitised trade compared to non-unitised trade for each commodity for each country-to-country pairing.
- A regional origin-destination trade matrix (originally developed for the ETIS project) was used to estimate region-to-region trade flows within Europe.
- A geographical zoning system was developed to provide outputs, with the greatest level of detail for intra-European trade (generally at a regional level), but deep-sea trade at only a country or world area level (e.g. USA, Russia, Asia etc.).

- Outputs from the origin-destination database were produced in terms of unitised and non-unitised tonnes at the NST2 level of commodity detail.

Detailed region-to-region trade data with commodity detail was provided to the Business Cases within the project, but the rest of this chapter provides high-level trade data to size the potential European intermodal market in 2005.

**European Intermodal Market Size 2005**

Table 1 provides a high level summary of the estimated size of the European intermodal market in 2005, with intra-EU27 and extra-EU27 trade shown separately. The global totals are shown in terms of total tonnes of trade, unitised tonnes (i.e. the potential market for international intermodal transport within the EU) and an estimate of the number TEUs of unitised trade.

As, by definition, intra-EU27 trade has an origin and a destination in the EU, it has only been counted once.

**Table 12 Estimated intra- and extra-EU27 Trade, 2005 (million). Source: MDS Transmodal, based on Eurostat data**

| | Total tonnes | Of which: unitised tonnes |
|---|---|---|
| Intra-EU27 | 1,309 | 553 |
| Extra-EU27 – imports | 1,547 | 193 |
| Extra-EU27 – exports | 452 | 166 |
| Total | 3,308 | 912 |

The results of the analysis suggest that:

- Intra-EU trade (for all 27 Member States in 2007) amounted to some 1,309 million tonnes, of which an estimated 553 million tonnes or 71 million TEU (42%) was unitised.
- Extra-EU trade amounted to 2,053 tonnes, of which an estimated 383 million tonnes or 49 million TEU (19%) was unitised.
- Overall there is a significant trade imbalance in favour of imports to the EU from the rest of the world (imports are 3.4 times exports in terms of tonnes), reflecting the extent to which the EU imports energy sources and raw materials for manufacturing processes; however, the trade imbalance in higher value unitised cargoes is only 1.2 in favour of imports from the rest of the world.
- Total unitised trade in 2005 amounted to 912 million tonnes, which represents the potential market that intermodal freight transport can address.

*Trade by Member State in Tonnes*

Given the FREIGHTWISE project's focus on intermodal (i.e. unitised) freight transport, the following analysis focuses on trade data in terms of estimated unitised tonnes.

Intra-EU trade

The following chart 6 and table 6 provide an analysis of intra-EU27 trade in unitised tonnes by country and direction in 2005.

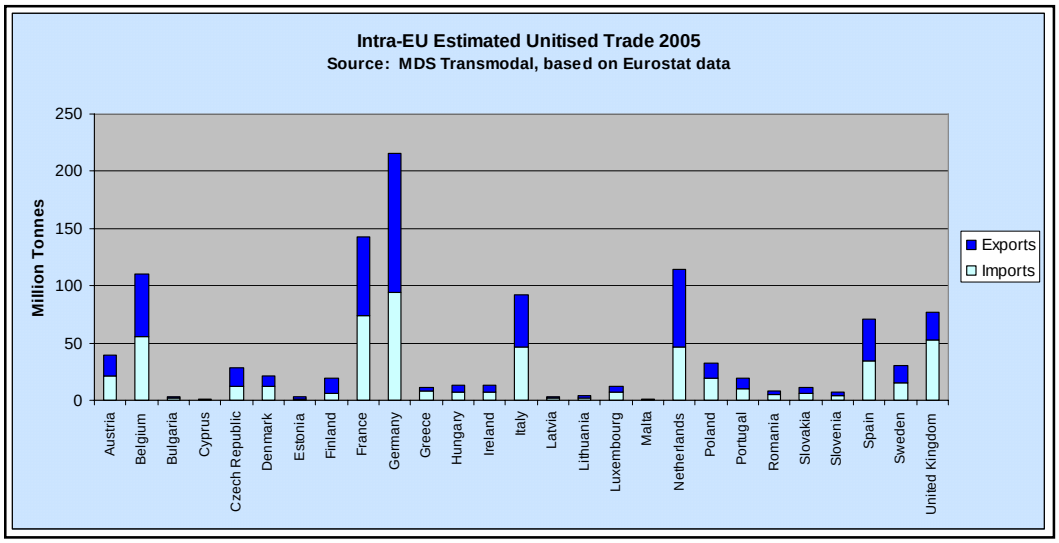



**Figure 20 Intra-EU27 unitised trade by Member State, 2005 (Million tonnes). Source: MDS Transmodal**

**Table 13 Estimated intra-EU27 unitised trade by Member State, 2005 (Million tonnes). Source: MDS Transmodal, based on Eurostat data**

| Member State | Imports | Exports | Trade balance |
|---|---|---|---|
| Austria | 21.0 | 18.7 | -2.3 |
| Belgium | 55.2 | 55.3 | +0.1 |
| Bulgaria | 1.9 | 1.5 | -0.4 |
| Cyprus | 0.7 | 0.3 | -0.4 |
| Czech Republic | 12.2 | 16.3 | +4.1 |
| Denmark | 12.0 | 9.5 | -2.5 |
| Estonia | 1.3 | 1.7 | +0.4 |
| Finland | 6.6 | 13.1 | +6.5 |
| France | 74.3 | 68.6 | -5.7 |
| Germany | 94.0 | 121.8 | +27.8 |
| Greece | 7.6 | 3.8 | -3.8 |
| Hungary | 6.9 | 6.3 | -0.6 |
| Ireland | 7.2 | 6.3 | -0.8 |
| Italy | 46.6 | 45.2 | -1.4 |
| Latvia | 1.6 | 1.9 | 0.4 |
| Lithuania | 2.2 | 1.9 | -0.2 |
| Luxemburg | 7.5 | 5.0 | -2.5 |
| Malta | 0.7 | 0.1 | -0.6 |
| Netherlands | 47.0 | 67.8 | +20.8 |
| Poland | 19.5 | 13.3 | -6.2 |
| Portugal | 10.4 | 8.8 | -1.6 |
| Romania | 4.9 | 2.9 | -2.0 |
| Slovakia | 5.9 | 4.9 | -1.0 |
| Slovenia | 4.0 | 2.7 | -1.3 |
| Spain | 34.6 | 36.5 | +1.9 |
| Sweden | 15.5 | 15.1 | -4.0 |
| UK | 52.5 | 24.3 | -28.2 |
| Total | 553.5 | 553.5 | - |

The size of the intra-EU27 unitised trade flows to and from individual Member States largely reflects population size and geographic location (i.e. whether the Member State is located close to other large Member States), but the balance of trade in unitised goods tends to reflect the economic structure of the particular Member States. The largest trade flows are to and from the largest Member States in terms of population size: Germany is the largest importer (94.0 million tonnes) and exporter (121.8 million tonnes); France is the second largest importer (74 million tonnes) and exporter (68.6 million tonnes). Germany has the biggest "trade surplus" in unitised goods by weight with the rest of the EU at +27.8 million tonnes, while the UK has the largest "trade deficit" in unitised goods with the rest of the EU at –28.2 million TEU, reflecting the strong manufacturing sector in Germany and a greater focus on service industries in the UK.

Extra-EU Trade

Figure 21 and Table 14 provide an analysis of estimated extra-EU27 unitised trade in tonnes by country and direction in 2005.

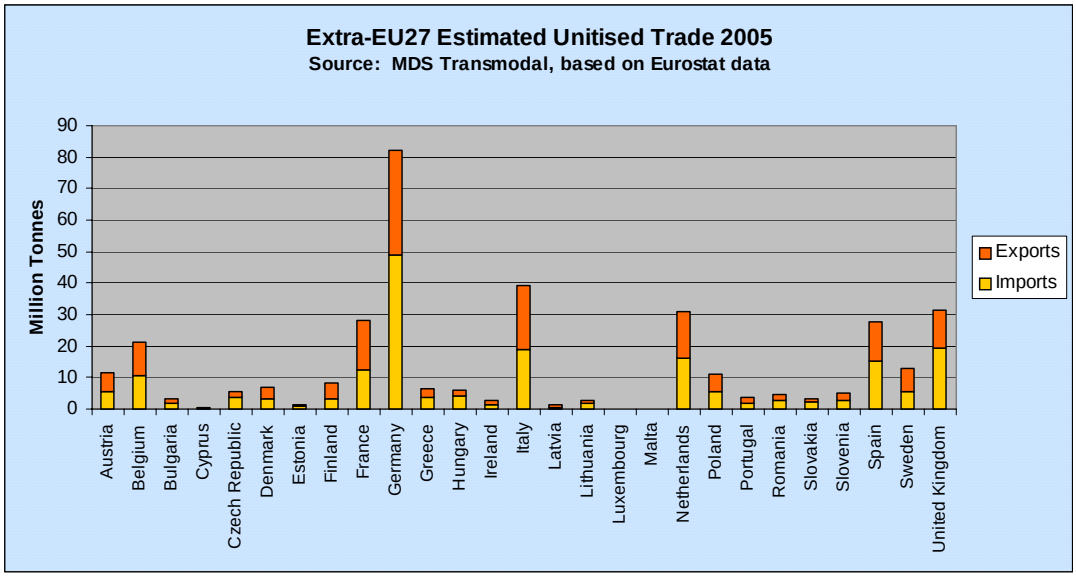



**Figure 21 Estimated extra-EU27 unitised trade by Member State, 2005 (Million unitised tonnes). Source: MDS Transmodal**

**Table 14 Extra-EU27 unitised trade, 2005 (Million tonnes). Source: MDS Transmodal, based on Eurostat data**

| Member State | Imports | Exports | Trade balance |
|---|---|---|---|
| Austria | 5.6 | 6.0 | +0.4 |
| Belgium | 10.4 | 11.0 | +0.6 |
| Bulgaria | 1.8 | 1.6 | -0.2 |
| Cyprus | 0.3 | 0.1 | -0.2 |
| Czech Republic | 3.6 | 1.9 | -1.7 |
| Denmark | 3.1 | 4.0 | +0.8 |
| Estonia | 0.8 | 0.6 | -0.2 |
| Finland | 3.1 | 5.2 | +2.1 |
| France | 12.2 | 16.1 | +3.9 |
| Germany | 48.8 | 33.1 | -15.7 |
| Greece | 3.7 | 2.7 | -1.0 |
| Hungary | 4.1 | 1.7 | -2.4 |
| Ireland | 1.4 | 1.4 | - |
| Italy | 19.0 | 20.4 | +1.4 |
| Latvia | 0.6 | 0.6 | - |
| Lithuania | 1.8 | 0.9 | -0.9 |
| Luxemburg | 0.1 | 0.1 | - |
| Malta | 0.1 | - | -0.1 |
| Netherlands | 16.1 | 14.9 | -1.2 |
| Poland | 5.7 | 5.5 | -0.2 |
| Portugal | 1.9 | 1.6 | -0.2 |
| Romania | 2.7 | 2.1 | -0.5 |
| Slovakia | 2.5 | 0.7 | -1.7 |
| Slovenia | 3.0 | 2.3 | -0.7 |
| Spain | 15.4 | 12.2 | -3.3 |
| Sweden | 5.6 | 7.6 | +2.0 |
| UK | 19.4 | 11.9 | -7.5 |
| Total | 193.0 | 166.1 | -26.8 |

As with intra-EU27 trade, the largest extra-EU27 trade flows are to and from the largest Member States in terms of population size: Germany is the largest importer (48.8 million tonnes) and exporter (33.1 million tonnes); the UK, with its focus on the service sector, is the second largest importer (19.4 million tonnes) and France is the second largest exporter (16.1 million tonnes). Germany has the biggest trade deficit in unitised goods with the rest of the world at –15.7 million tonnes, followed by the UK (-7.5 million tonnes). Of the EU27 only France, Sweden, Austria and Finland had a trade surplus in unitised goods in 2005 and the EU27 as a whole had a trade deficit of 26.8 million tonnes.

## Intra-EU27 Trade by Commodity

The following tables provide an analysis of intra-EU27 trade by commodity in 2005, presenting the analysis in terms of a ranking of the Top10 commodities by volume in tonnes, unitised tonnes.

*Total Trade between Member States*

Within the EU27 in 2005 the main commodities that were traded between the Member States by volume were bulk commodities, with crude petroleum being the most important at 221

million tonnes and construction materials the second most important at 121 million tonnes. Raw materials or semi-finished products requiring further processing, such as iron ore, cereals, coal, crude steel, are in the Top 10; see Table 15. However, there are higher value added commodities in the top 10 with chemical products at No.4, other manufactures at No.5 and manufactures of material at No.6 in the ranking.

**Table 15 Intra-EU27 Total Tonnes 2005: Top 10 Commodities. Source: MDS Transmodal**

| Ranking | Commodity | M Tonnes |
|---|---|---|
| 1 | Crude petroleum | 221 |
| 2 | Sand, gravel, clay and slag | 121 |
| 3 | Pig iron and crude steel; ferro-alloys | 98 |
| 4 | Other chemical products | 85 |
| 5 | Other manufactured articles | 83 |
| 6 | Manufactures of material | 73 |
| 7 | Iron-ore | 66 |
| 8 | Wood and cork | 52 |
| 9 | Cereals | 49 |
| 10 | Coal | 48 |

Estimated unitised trade between Member States

Within the EU27 the most important unitised commodities that were traded between the Member States in 2005 (Table 16) were higher value commodities, with other manufactures ranked No.1 (68 million tonnes), chemical products at No.2 (62 million tonnes) and manufactures of material at No.3 (58 million tonnes). Food is prominent within the ranking with potatoes, beverages and perishable foodstuffs all in the Top 10. Intermodal transport tends to be more suitable for the transport of these commodities, which are not usually transported in bulk.

**Table 16 Intra-EU27 Unitised Tonnes 2005: Top 10 Commodities. Source: MDS Transmodal, based on Eurostat data**

| Ranking | Commodity | M Tonnes |
|---|---|---|
| 1 | Other manufactured articles | 68 |
| 2 | Other chemical products | 62 |
| 3 | Manufactures of material | 58 |
| 4 | Potatoes | 43 |
| 5 | Other machinery apparatus and appliances, engines, parts | 33 |
| 6 | Beverages | 29 |
| 7 | Pig iron and crude steel ; ferro-alloys | 29 |
| 8 | Perishable foodstuffs | 28 |
| 9 | Transport equipment | 18 |
| 10 | Cereals | 16 |

**Extra-EU27 imports by commodity**

The following tables provide an analysis of extra-EU27 imports by commodity in 2005, presenting the analysis in terms of a ranking of the Top10 commodities by volume in tonnes, unitised tonnes.

*Total imports*

The major import commodities by volume in 2005 were bulk commodities relating to the energy industry (crude petroleum at No.1, coal at No.3 and fuel derivatives at No.4), raw materials for industrial processes (iron ore at No.2 and coal at No.3), construction materials (sand, gravel, clay and slag at No.5 and wood at No.6) and raw materials for the agricultural industry (animal food at No.7 and oil seeds and oleaginous fruit and fats (No.10); see Table 17. A high proportion of these commodities is transported in bulk and so does not represent a segment of the potential intermodal market.

The only semi-finished or manufactured commodities, which might be more suitable for intermodal transport, were steel at No.8 and manufactures of materials at No.9.

**Table 17 Extra-EU27 Imports Total Tonnes 2005: Top 10 Commodities. Source: MDS Transmodal, based on Eurostat data**

| Ranking | Commodity | M Tonnes |
|---|---|---|
| 1 | Crude petroleum | 650 |
| 2 | Iron-ore | 187 |
| 3 | Coal | 186 |
| 4 | Fuel derivatives | 140 |
| 5 | Sand, gravel, clay and slag | 52 |
| 6 | Wood and cork | 34 |
| 7 | Animal food and foodstuff waste | 33 |
| 8 | Pig iron and crude steel; ferro-alloys | 32 |
| 9 | Manufactures of material | 28 |
| 10 | Oil seeds and oleaginous fruit and fats | 25 |

*Estimated unitised imports*

The most important unitised commodities that were imported into the EU27 in 2005 were higher value commodities, with fuel and chemicals prominent and manufactured goods ranked at No.3, No.4, No.5, No.6 and No.8; see Table 18. Foodstuffs are also important, with potatoes at No.2 and perishable foodstuffs at No.10.

**Table 18 Extra-EU27 Imports Total Tonnes 2005: Top 10 Commodities. Source: MDS Transmodal, based on Eurostat data**

| Ranking | Commodity | M Tonnes |
|---|---|---|
| 1 | Fuel derivatives | 44 |
| 2 | Potatoes | 14 |
| 3 | Manufactures of material | 14 |
| 4 | Other manufactured articles | 12 |
| 5 | Other machinery apparatus and appliances, engines, parts thereof | 12 |
| 6 | Leather, textiles and clothing | 10 |
| 7 | Other chemical products | 8 |
| 8 | Miscellaneous articles | 8 |
| 9 | Sand, gravel, clay and slag | 7 |
| 10 | Perishable foodstuffs | 6 |

**Extra-EU27 exports by commodity**

The following tables provide an analysis of extra-EU27 exports by commodity in 2005, presenting the analysis in terms of a ranking of the Top 10 commodities by volume in tonnes and unitised tonnes.

*Total exports*

The major export commodities from the EU27 by volume in 2005 were (apart from crude oil) relatively high value manufactures such as manufactures of materials (ranked at No.2), chemical products (No.3), steel (No.4), other manufactures (No.5) and other machinery (ranked at No.10); see Table 19.

Some bulk raw materials such as crude oil, iron ore, construction materials and cereals also feature in the Top 10, but are significantly lower in terms of volume than imports of the same commodities, reflecting Europe's relative strength in manufacturing and relative poverty in terms of natural resources. Overall, bulk commodities are less prominent in the Top 10 exports than in the Top 10 imports, again reflecting Europe's relative strength in manufacturing.

**Table 19 Extra-EU27 Exports Total Tonnes 2005: Top 10 Commodities. Source: MDS Transmodal, based on Eurostat data**

| Ranking | Commodity | M Tonnes |
|---|---|---|
| 1 | Crude petroleum | 130 |
| 2 | Manufactures of material | 31 |
| 3 | Other chemical products | 31 |
| 4 | Pig iron and crude steel; ferro-alloys | 29 |
| 5 | Other manufactured articles | 28 |
| 6 | Sand, gravel, clay and slag | 25 |
| 7 | Iron-ore | 21 |
| 8 | Cereals | 19 |
| 9 | Other machinery apparatus and appliances, engines, parts thereof | 18 |
| 10 | Wood and cork | 14 |

*Estimated Unitised Exports*

The most important unitised commodities that were exported from the EU27 in 2005 were higher value commodities, with an emphasis on manufactures with manufactures of material at No.1, other manufactures at No.2, other chemicals at No.3, machinery at No.4, beverages at No.5, steel at No.6 and miscellaneous articles at No.9; see Table 20. The inclusion of paper pulp and waste paper within the Top 10 may reflect an increasing trend for Europe to export waste paper for recycling in the Far East, with shippers taking advantage of cheap freight rates available on the return leg of deep sea shipping services, in particular, to China.

**Table 20 Extra-EU27 Estimated Exports Unitised Tonnes 2005: Top 10 Commodities. Source: MDS Transmodal, based on Eurostat data**

| Ranking | Commodity | M Tonnes |
|---|---|---|
| 1 | Manufactures of material | 20 |
| 2 | Other manufactured articles | 20 |
| 3 | Other chemical products | 19 |
| 4 | Other machinery apparatus and appliances, engines, parts thereof | 16 |
| 5 | Beverages | 8 |
| 6 | Pig iron and crude steel ; ferro-alloys | 8 |
| 7 | Potatoes | 7 |
| 8 | Perishable foodstuffs | 5 |
| 9 | Miscellaneous articles | 5 |
| 10 | Paper pulp and waste paper | 5 |

**Overall Statistical Conclusions and Considerations**

Total European unitised trade in 2005 is estimated at 912 million tonnes and this represents the potential market size for intermodal transport in the European Union.

553 million tonnes of this unitised trade was within the EU27, while 339 million tonnes was between the EU27 and non-EU Europe and the rest of the world. Although there is considerable political attention on trade with the rest of the world (e.g. with China) because of its impact on the competitiveness of European manufacturing, unitised trade between Member States of the EU27 is therefore more significant in terms of volume.

## THE IMPACT FROM ENLARGEMENT ON THE INTERMODAL MARKET

### Introduction

Strong economic growth continued in New Member States of the EU: in a regional average, the GDP increased by 5.8% in the Q2-2006 with harmonious structure - manufacturing progress together with increasing domestic demand on constructions and market services.

Low costs for production and manufacturing, frameworks for investments support and qualified human resources with historical experience in industry are specific conditions in the CEECs, attracting investors for long-term plans. Except that, regarding to the geographic position, CEECs already play a role of large logistic node, with quickly growing quality of services.

The situation have been analysed in the following five of the new EU25 (most important providers of inter/multi modal transport):

- Czech Republic
- Hungary
- Poland
- Slovakia and
- Slovenia

To better structure the findings and show the development of the society, economic background and linked changes in the transport area, three historical periods will be examined: Before, During and After Enlargement

### The Main Changes in Period of Access Negotiations 1996 – 2003

A summary of the changes that occurred in the accession countries during the period of access negotiations is shown in Table 21.

**Table 21 Main changes in the period of access negotiations**

| Areas: | Main changes in period 1996 – 2003: |
|---|---|
| Economy | Transformation of economy with initial problems |
| | Further changes in legislation for enterprises and changes in taxation |
| | Progressive harmonisation with EU |
| | Privatisation: the decisive part of production areas |
| | Rise of big investments, large business centres and industrial zones |
| | Complete harmonization of norms with EU |
| | Support of investments for creation of new capacities in industrial zones |
| | Increase of energy and service prices |
| Legislative | Further changes in legislation for enterprises, changes in taxation |
| | Analytic comparison of legislative norms of candidate countries with European legislation (screening), norms harmonisation with EU |
| | Reform of state administration, changes in geographic area organisation |
| | New norms for market economy and for undertaking |
| | Support for exterior investment |
| | Application of legislative changes for liberalisation of transport market |

| | |
|---|---|
| Economy and production | Completion of industry restructuring and rise in economy |
| | Completion of communication, mining and power-station privatisation |
| | Increase of new capacities in industrial zones, new production facilities and start of new productions (mainly automotive) |
| | Further inhibition of heavy industry and metallurgy |
| | Transition from heavy to light industry |
| Transport | Revitalisation of railway transport as consequence of production increase |
| | The transport market resuscitated, after industry restructuring |
| | Increase in (international) road transit in relation to neighbouring countries, because no local legal limitations imposed |
| | Increase of demand on railway and intermodal transport from productive sector. Required timely and quality services |
| | Transport market liberalisation, also in railway transport |
| | Progressive extinction of inland waterways transport, liquidation of the only inland waterways transport operator CSPLO |
| | Outstanding development of road transport, large innovations of truck fleets |
| | Principal rules for harmonisation of transport market still not applied; the state transport policy for new market conditions not existing |
| | Rise of 50% in road transport transit CR because of missing taxation of road freight in the CR, and as a result of toll introduction in Austria and Germany |
| | Liberalisation of transport market continues also on railway, new private companies arising |

*Intermodal Transport*

The intermodal transport services have been liberalized, followed by privatization of many terminals, and separation from railway operation. The railway sector was constrained by financial and restructuring needs. The road transport sector was not regulated and the tax imposition was not effective.

Though the total volume increased and the increase of units, the portion of intermodality was still small and represented only 7.7% from the railway transport and only 1.35% from the total transport (road plus railway in the CR in 2003).

The mostly used system in intermodal transport was that of large containers; after year 2003 the system of exchangeable superstructures was in intensive development. The system of transport of road semi-trailers was not used at that time.

In competition with road transport, the proprietors of transhipment terminals started , to organize complete freight trains from harbours like Hamburg, Bremen and Rotterdam and the adjacent distribution of containers from terminals in the CR by road.

The national support for intermodal transport was insufficient and a lot of opportunities to support the railway and to limit the road traffic were lost at that time. Volume and performance given in tables 18 and 19 provide data on containers traffic and superstructures transport.

During this period of partial re-structuring, industry growth increased and was followed by the GDP increase, positively influenced by large export demand. New production capacities were opened and price development was positive.

Industry restructuring was finalised, rationalisation in cost evaluation commenced, and industry control improved. The positive development was mainly influenced by enterprises, owned by foreign companies, having the prevailing impact on results of industry. Also the results of domestic enterprises improved.

*Changes in the Transport Sector*

The positive changes in the economy were reflected in the transport by general revitalisation and in the growth of demand for new services. But, these years brought only increases in road transport, while the railway and waterway transport did not manage to expand.

It should be noted that the statistics about the volume of transported cargo has to consider the activity of foreign companies, distributing their own production by foreign transporters.

External conditions set up by state administrative:

- Taxation level of road transport
- State support for intermodal transport
- Finished restructuring of the railway area
- Starting position of intermodal operators
- Entrance of foreign partners in the international market

Demand is the most important factor for future development. The demand is given by economic conditions of transport itself, and following quality and flexible services:

- Transport duration
- Guaranteed time of arrival
- One-stop-shop
- Connection between manufacturing capacity and logistical transport system
- Customs and forwarding services
- Warehousing
- Door-to-door services
- Tracking & Tracing
- High frequency of shuttle train departures
- Just-in-time supplying for some types of cargoes

*Other obstacles for development of intermodal transport*

Development of intermodal transport is held back by these factors:

- Competition in road transport, decreasing prices
- State administrative is under pressure from strong automotive lobby, area road freight transport was fully liberalized, railway liberalization is only in process
- Construction of new industrial zones is not usually solved by railway, even the intermodal transhipment facilities are built additionally
- PPP projects on the national wide level are not yet prevalent
- Small area of the CR is a disadvantage for intermodal transport on national level
- Information on the specific consignment in the chain not completed

Development of intermodal transport is conditioned by:

- Market liberalization on the railways
- Free access to infrastructure for operators
- Installation of toll in highway network
- Rail freight vehicle park modernization
- Carriage driving interoperability
- State endorsement for intermodal transport expansion
- Quotation from the Czech Railways side

The last 15 years of experience from intermodal transport development show that implementation was difficult, principally because of the long process of railway restructuring. Demand growth led industry to control very carefully the production costs, which led to maximum quality of intermodal transport.

Implementation of Electronic Toll Collection on highways marked up the road transport on 15-20% and, partly, enhanced the attractiveness of intermodal transport.

The government plans to continue the way of ensuring sustainable development. That is possible only by improving the quality and utilisation of already existing transport systems and further development of new facilities. There is an opportunity for better co-operation between different transport modes. The establishment of logistics centres should stimulate the combined transport by ensuring preferences, discounts and grants. Basic principle of the logistics development programme is an initiation of the co-financing market for contributing and promoting intermodality, having strongly committed participants and ensuring necessary private resources.

*Enlargement to EU27*

Enlargement from EU25 to EU27 enables easier operation of intermodal transport lines between Central and Western Europe and harbours at the Black Sea; these harbours are connection pointss to the Balkans and to Asia. At the present time, the creation of new rail connections between Czech, Slovak and Hungarian railway stations and the Black Sea is being discussed.

**Overall Conclusions and Consideration of Enlargement**

The Central European countries generally exploit the advantages of their favourable geopolitical position to manage transport outside their own domestic area. These countries became a large ‘transport node’ for European freight transport flows in the transit directions West-East and North-South, by using environmentally friendly transport & logistics solutions.

Membership of the European Union since 2004 gave an significant boost to the Czech Republic, Hungary and Poland. These countries now benefit from the relocation of production from Western Europe. An expansion of logistics markets, a growth in both the production and the retail sector, and improving transport networks in these new member countries are a logical result of this progress.

Considering costs, access and property factors important for logistics, the countries of Central Europe have moved up in the ranking of the Cushman & Wakefield, Healey & Baker: European Distribution Report - Czech Republic to 4th place, Poland to 5th and Hungary to 7th.

FREIGHTWISE could provide two main results to improve the position of intermodal transport in the CEE countries: a) better information about opportunities in terms of logistics facilities, and b) a harmonised approach across the EU for future development in intermodal traffic flow information.

In Annex 7, the socio-economic situation and development in states outside of EU15 (associated in the EU25), and the impact on transport generally and on intermodal transport specifically are reported.

Of course, tendencies in CEECs are, after the period of Enlargement and related instability, the same as in the EU15 – unusually fast growth of freight transport, especially in the road sector. The development depends on the economic growth; for GDP per capita in PPS see in Annex 5, volumes of freight transport versus GDP are shown in Annex 6.

# THE ROLE OF PUBLIC SECTOR AND OPPORTUNITIES FROM PPP IN THE INTERMODAL SECTOR

## The role of the public sector financing by developing intermodal transport in Eastern Europe

During the 1960s, 70s and 80s, intermodal transport in Eastern Europe was developed exclusively with the help of public funds, i.e. the government institutions were the only investors in building its infrastructure. Due to the considerable resources which the states could mobilise for this purpose, some important projects have been successfully carried out: the construction of the ferry connecting the Bulgarian port Varna on the Black Sea with the Soviet port Ilichovsk; building a terminal in Vidin for Ro-Ro carriages, opening container terminals on some ports and railway stations etc.

Although in the new socio-economic context the participation of the private sector in transport infrastructure development is expanding, the public sector still plays a dominant role in this process. Therefore public financing determines to a great extent the transport infrastructure enlargement and modernisation. However, over the past two decades, the economy of the majority of the East-European countries had very limited resources to support large infrastructure development projects. For this reason the main financing sources for such initiatives were and still are the EU founds.

According to the traditional EU policies, priorities are given to projects of significant importance for the Trans-European transport system – high speed railways and freight border crossings corridors.

Fortunately, the economic recovery is already enabling co-financing of some important transport infrastructure projects from the national budget. However the financial support from local communities' budgets is still an exception.

## Opportunities for cooperation agreements, joint marketing, PPPs

According to the Green Paper on Public Private Partnerships, published in 2004, "the term public private partnership ("PPP") is not defined at Community level. In general, the term refers to forms of cooperation between public authorities and the world of business which aim to ensure the funding, construction, renovation, management or maintenance of infrastructure and provision of a service".

Community law is neutral as regards whether public authorities choose to provide an economic activity themselves or to entrust it to a third party. If, however, public authorities decide to involve third parties in conducting an activity, Community law on public procurement and concessions may come into play.

The key features characterising a Public Private Partnership are the following:

- Relatively long duration of the Public – Private relationship
- Method of funding
- Role of the economic operator (design, construction, completion, operation, funding)
- Distribution of risks between the public partner and the private partner

The main reasons for applying PPP contracts are the:

- Growing budget constraints on public side
- Acknowledgment of added value of private sector

- Know-how of the private sector
- Access to finance, access to technologies not yet mastered
- Managerial efficiency and entrepreneurial spirit
- Social & economic evolution: reinforcing the competitiveness of all actors
- Transparency, public information & mutual shared information enabling future safe projects
- Qualitative improvement of the project: services provided versus investment capacity
- Reinforcing technical, legal, financial expertise both on public & private side
- Risk minimization, mainly for the public partners, provided a tender competition including the set up of a public-private-comparator (stop decision if required)
- Public entity: balanced economic & legal future safe framework
- Private Sector: carry risks related to construction, maintenance & operations
- Good chances to obtain dedicated loans from European Funding Institutions (e.g. EIB)
- Increased project security (technically, legally, financially) due to custom-made contractual framework, depending on agreed financial estimates, comprising different stages of the project lifecycle
- Accelerated realisation (10%-20%)

The main types of private sector participation in infrastructure development are shown in Table 22.

**Table 22 Main types of private sector participation in the infrastructure development**

| Design and Construction | Financing | Operation and Maintenance | Customer Relationship | Ownership of assets | Usual name | Duration (yrs) | Type of payment |
|---|---|---|---|---|---|---|---|
| Private | Public | Public | Public | Public | D&B | - | Fixed price |
| Public | Public | Private | Public | Public | O&M | 5-10 | Lump sum |
| Private | Public | Private | Public | Public | | 10-20 | User charges |
| Private | Private | Public | Public | Public | DB&O | 15-20 | Technical performance related |
| Private | Private | Public | Public | Public | DB&F | 15 | Annuities |
| Private | Private | Private | Public | Public | BOT OR BDFO | 20-30 | Technical performance related |
| Private | Private | Private | Private | Public | Concession | 30-50 | User charges |
| Private | Private | Private | Public | Private (temp.) private | BOOT/BOT | 20-30 | Technical performance related |
| Public/ Private | Public/ Private | Private | Private | Public/ Private | Concession | 15-25 | User charges |
| Public/ Private | Public/ Private | Public/ Private | Public/ Private | Public/ Private | Joint Venture | Perpetuity | User charges |
| Private | Private | Private | Public | Private (temp.) private | BOOT Privatisation | 20-30 | User charges |

For each PPP project it is necessary to assess whether partnership really adds value to the specific service or public works in question, compared with other options such as concluding a more traditional contract.

## Public Private Investment

A survey has been developed by the CORELOG project about the incentives to be distributed to the subjects involved in the development of logistics operations and of different transport modes (rail transport, short sea shipping and motorways of the sea).

Analysing the results of the survey about intermodal transport, 53% of the answers of the experts indicate that no measure has been implemented yet. However, the world of public services considers that an improvement in the diffusion of incentives for intermodal transport might be useful to development, while researchers give less importance to this theme. Successful examples of implementation come from specific business sectors.

According to the study, incentives should be mainly directed to nodes and infrastructures, while measures for innovation of logistics operations equipment and for transport users are not considered as a priority. Geographical breakdown shows that countries characterized by economic development feel a greater need to increase nodes and infrastructure availability.

With respect to specific targets; see Figure 22, priority is given to carrying out feasibility studies for nodes and to interventions for nodes and networks connections. Concerning transport providers, incentives should be addressed to them according to their own volume of activity (ton/km). In conclusion, the maximum priority is given to nodes and network connections.

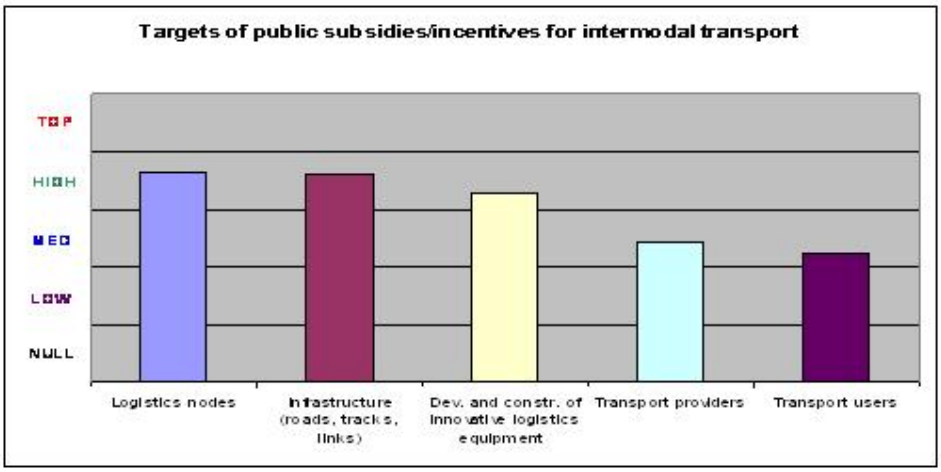



**Figure 22 Targets of Public subsidies**

Constraints in the implementation of the incentives are mostly normative (e.g. lack of regulations and procedures) and financial. Therefore, poor culture and education gaps amongst the various regions represent a significant limitation to the diffusion of such measures. This phenomenon can be mainly found in those countries where is present a deep separation between planning and concrete actions for logistics improvement.

## Economic assessment of PPP projects in the field intermodality and integrated services

The array of options for Public Private Partnerships may vary according to existing national laws. The success of partnerships may depend on the understanding of the flexibility necessary from both the public and private sides to conclude a mutually beneficial agreement while analysing all the possible opportunities. With this in mind, there are several important issues to consider when establishing Public Private Partnerships.

The first is that the relationship between public and private entities is ultimately predicated on the ability of both sides to receive favourable economic returns. Decision makers, both with the public sector and within the rail industry, will have to consider a large number of issues and at times reconcile competing or conflicting objectives. The ultimate solution requires both entities to work toward common goals.

During the process of setting up the rules of PPPs, it is important to ensure that flexibility is provided for in developing Public Private Partnerships. The multitude of possible arrangements, along with the vast array of projects possible in seeking intermodal transport solutions, require that the rules established for forming partnerships do not unduly limit the type and form of relationships possible.

A successful Public Private Partnership not only depends on the legal, institutional, and political impediments that must be overcome, but ultimately depends on the financial justification of the project. Public transport agencies must select the best investments, while the private sector must increase stockholder value by earning a reasonable return on investments.

In analysing the economic feasibility of an intermodal project investment, the public entity uses some form of cost-benefit analysis, such as net present value, and the private sector evaluates the rate of return from expected cash flows. A decision-making tool that jointly performs both of these analyses can be useful if it allows each party to understand the full range of costs and benefits accrued by the other. As a result, public and private entities can be confident that their respective investments are not unduly favouring the other party. Figure 23 illustrates this balance that must be achieved by an economic model that is used to analyse the economic feasibility of Public Private Partnerships.

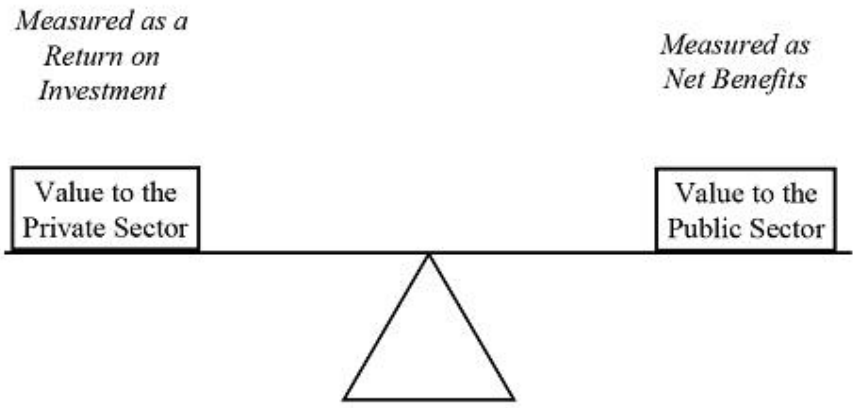



**Figure 23** Balance that should be achieved for the economic feasibility of Public Private Partnerships

From the customers' point of view, transport services are required, in order to have goods/ cargo shipped from point A to point B. As a rule, the customer in need of transport services is looking primarily for:

- Availability of the services required (in many cases a forwarding company will secure availability of the services)
- Reliability (especially reliable transport time)

- Security (no loss or damage to the cargo) under the main restriction of minimal costs.

It is mainly the restriction of "minimal costs" (=competitive prices of the services) that prevented intermodality in the past to be a European success story, because of the simple fact that intermodality requires - as opposed to single modal transport – additional processes and infrastructure, which generate additional costs (see Figure 24).

Additional important factors are comparatively long travel-times (not in all, but many cases) and deficits in security (which becomes a bigger problem the more actors are involved in a supply / transport chain).

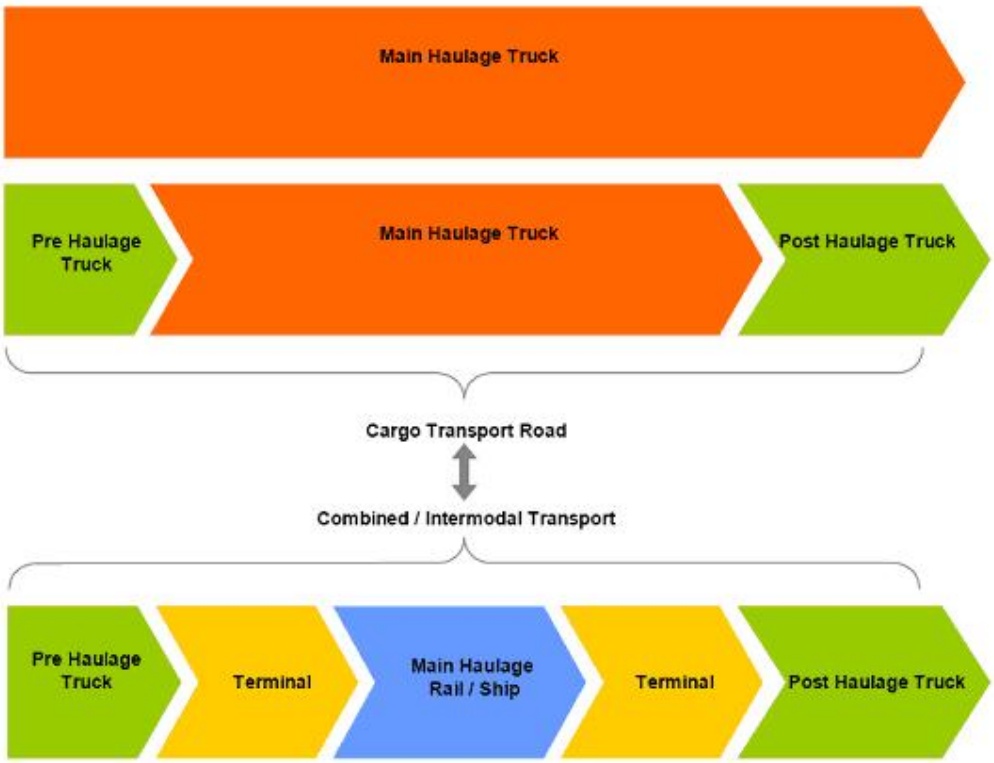



**Figure 24** Processes and cost-drivers of intermodality. Source IMONODE

FREIGHTWISE could contribute mainly on the design phase of a PPP initiative, especially for the adoption of the generic framework in which all the processes and actors of multimodal transport are managed according to each role in the chain.

The fact of designing new initiatives using a framework would help at modelling level, at organisational level and in the separation of responsibilities among different actors

In Annex 8 examples of PPP schemes are reported.

## LEGAL AND REGULATORY FRAMEWORKS AND THEIR IMPACT ON THE MARKET DEVELOPMENT AND ON MODAL CHOICES

It is important to mention that an evaluation of the impact of a legal framework in a country requires the development of a suitable evaluation methodology, including the necessary indicators that will define the situation before and after the implementation. The research on quantitative data and information indicating the impact of laws/ regulations related to intermodality showed that the relationship between a law and its result is more of an assumption than a fact. The parameters that may affect the market of intermodal transport are numerous and data such as freight flows in intermodal transport, share of shippers in the market or the development of intermodal nodes could certainly be an indication but not a proof of the relationship between cause and result.

Moreover, the creation of the legal and regulatory framework for intermodal transport in the new socio-economic context in Eastern Europe started only over the past few years and this process is not yet finished. Therefore, it would be difficult to assess the impact of this factor on the development of combined and integrated transport services. On the other hand, the statistics covering the intermodal transport in the countries are fractional and incomplete, i.e. unreliable.

However, in the following, the evaluation of the impact of the laws in Romania is attempted, according to national freight transport data.

Despite of many European and Romanian legislative facilitations, there is no significant impacts realised on the development of intermodality in Romanian transport. The intermodal and combined transport industries didn't react clearly to the issued laws and regulations. The transport modes are in the same position, separated modes, before and after issuing the respective facilitating laws and regulations.

There are laws and regulations referring directly to intermodal transport, combined transport, or integrated services. Also very important are the laws and regulations referring to transport which could facilitate indirectly the intermodal and combined transport. Both of these two categories are mentioned in the table 45 analysing the situation existing today in Romania.

Referring to the Sector Operational Programme for Transport (SOP-T), officially promoted by Romanian Ministry of Transport, modal shares for Romanian land transport are shown below, in order to provide a context for the discussion of intermodalism:

- Transport volumes are lower, even now, than in former times.
- Road shares increased rapidly after 1990, and are still increasing.
- Rail volumes recovered recently but share continues to decline.

In Annex 9 – "Legal and regulatory framework and their impact on the market development and on modal choices" the main Laws and Regulations at EU level and at National level in some of the main Eastern Countries are reported according to their relevance and impact on the intermodal market.

# EU SUPPORTIVE FUNDING SCHEMES AND THEIR IMPACT ON THE INTERMODAL MARKET

## Economic background

Charges arising from transport directly, or indirectly, should be among the first accessible financial resources for potential FREIGHTWISE related investments. These resources can be derived from infrastructure usage charging and various tax revenues obtained from transport. Funding, both national and EU, is further step to enhance needed investment amounts. Other types of resources include bank loans, including those available from the EIB. Finally, there is the possibility for engaging private capital in the case of PPP.

## Charging and taxes

*Charging the infrastructure use*

Charging for transport network capacity use must be in accordance with international and national legislation. Usually, the maximum price level is given by the relevant national ministry.

A level playing field of charging should be ensured to avoid unfair conditions.

Fuel taxes

Since 1992, common rules on the structures harmonisation of excise duties on mineral oils are in force. Member States shall fix their rates in accordance with the European Directive 92/81/EEC, which provides the minimum rates of excise duty for these fuels. The European Commission has further harmonised this area with the decision in COM/2002/0410 in 2002.

Vehicle taxes

In 1999, the European Parliament and the Council adopted the Directive 99/62/EC, which introduces common rules on annual taxes for heavy goods vehicles above 12 tonnes. The Directive aims to develop the functioning of the internal market and to create common competition conditions, by reducing the differences in levels and systems of vehicle taxes in Member States. In the Directive, there are defined minimum rates for the annual vehicle tax on heavy goods motor vehicles and vehicle combinations in accordance with a number and a configuration of axles, and with the maximum permissible gross of laden weight. The structure of taxes and procedures for collecting them are entrusted under the national competence.

User charges

The European Directive 99/62/EC also sets rules on time-based user charges for heavy goods vehicles above 12 tonnes for the infrastructure use. This legislation is called the ‘Eurovignette’.

Tolls

This Directive also describes rules for distance-related tolling and gives a base for electronic tolling in this way, too.

This Directive ensures that tolls and user charges can be applied homogeneously, taking into account that the application of tolls and user charges is not mandatory for Member States.

The Commission is preparing a new system for road charging, taking into account the principles stated in the White Paper on European Transport Policy for 2010: time to decide.

## Regional Policy Background

According to the draft Council Regulation laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund, the Council of the European Union prepares the Community Strategic Guidelines (CSG) concerning the cohesion, setting the framework for the Funds interventions.

Based on the CSG, each Member State prepares its National Strategic Reference Framework (NSRF) that links the Community policies with the national policies and determines the strategy of the particular country for the years 2007-2013. The main tools for implementation of the policy in this period will include the European Regional Development Fund, the European Social Fund and the Cohesion Fund.

The NSRF contains description and justification of selected priorities in the context of CSG and particular operational programmes with the framework. That substantiates further indicative allocations of funds.

## DG TREN

Transport policy activities are aimed at sustainable mobility combining Europe's competitiveness with the welfare of its citizens. It is an essential component of the Lisbon strategy and contributes to the social and territorial cohesion in the EU.

Marco Polo programme, of DG TREN, can be seen as 'bottom-up' from the industry and TEN-T is 'top-down' DG TREN and the Member States.

*MARCO POLO Programme*

In its recent revision of the White Paper, the European Transport Policy proposes a shift from road to other modes, where appropriate and possible. Marco Polo is mainly concerned with modal shift to maritime transport, but it also covers rail services, if that can be achieved only through the extension of existing services. With Marco Polo proposals both the authorities and industry consortia can approach the Commission direct.

The first Marco Polo Programme lasted from 2003 to 2006. In the table below, results from years 2003-2005 can be seen. The results regarding year 2006 are not included yet.

**Table 23 Results of MARCO POLO I**

| | 2003 | 2004 | 2005 |
|---|---|---|---|
| Committed Budget (in M€) | 13 | 20 | 22 |
| Received Proposals | 92 | 62 | 63 |
| Eligible Proposals | 87 | 59 | 60 |
| Concluded Contracts | 13 | 12 | 16 |
| Freight to be shifted (in billion tkm) | 12.4 | 14.4 | 10.0 |
| Environmental benefit (in M€) | 204 | 324 | 254 |

| | | | |
|---|---|---|---|
| External costs saved (per € 1 of subvention) | 15.7 | 15.9 | 11.7 |

To extend that level of support, it has been decided to continue with the Marco Polo II Programme from 2007.

*MARCO POLO II*

MARCO POLO II aims at shift or avoidance of traffic that is a substantial part of the expected yearly aggregate increase in international road freight traffic (in tonne-kilometres), to short sea shipping, rail and inland waterways or to more modes. Road transport should be as short as possible, mainly pre- and on-carriage.

The project will run between 2007 and 2013 with a global budget of 400 M€ (2004 value). Yearly calls for project proposals will be open. The calls will be published in the last quarter of every year and be closed in the first quarter of the following year.

The Marco Polo II includes some new actions, including motorways of the sea and traffic avoidance. The programme has been extended to countries bordering the EU. It is estimated that €1 from grants shall generate at least €6, taking social and environmental benefits into account.

Support actions are intended to reduce congestion, lessen the environmental impact by using advanced intermodal transport, and contribute to the efficiency and sustainability of the transport system. The added value will be provided to the EU, without having negative impacts.

Modal shift actions focus on shifting as much freight as economically meaningful under current market conditions from road. It is expected that start-ups of new services or enhancements to existing services will be proposed.

Catalyst actions should basically change the form of non-road freight transport. It is expected that there will be highly innovative projects to overcome structural market barriers in freight. Real break-through solutions are anticipated here.

Motorways of the sea actions focus on door-to-door services, which can shift freight from long road transport to a combination of short sea and other modes. These actions shall be innovative at a European level in terms of logistics, equipment, products and services.

Traffic avoidance actions integrate transport directly into production logistics: reducing freight transport demand by road has a direct environmental impact. Actions of this type shall not affect production.
Common learning actions are going to improve knowledge in the freight logistics with advanced methods and procedures of co-operation in the freight market. Improvement of co-operation and sharing of know-how is planned.

*TEN-T Programme*

The rules on TEN-T network are defined in the Decision No 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the Trans-European Transport Network.

A valid assessment of the TEN-T Programme and its impact on intermodality has been made by WP12 of Freightwise (Report D12.1).

The programme will now include support to finance Sea Motorways, with the first of 6 Calls for Tender in December 2007.

*TEMPO Programme*

The TEMPO programme (Trans-European intelligent transport systeMs PrOjects) was launched in 2001. The programme aims to support harmonization in deployment of intelligent transport systems (ITS) and linked types of services on the Trans-European Road Network (TERN).

The TEMPO framework is a programme for the period 2001 to 2006. The programme was designed for the convergence between national/regional ITS projects and the implementation in the road transport in the whole Europe.

TEMPO areas:

- Review of the ITS deployment process in Europe and steps towards a European Deployment Agenda
- TEMPO project monitoring and co-ordination
- TEMPO Programme management and assessment

Tempo Priority Actions:

- Implementation of high quality road monitoring infrastructure for reliable ITS services
- Establishment of a European network of traffic centres
- Traffic management and control measures against bottlenecks and for smooth traffic flows
- Easy access to high quality traveller information services, incl. interface with other modes
- Fleet and freight management systems to improve the safety and efficiency of freight transport
- Easy and efficient electronic fee collection systems (EFC)
- Road safety and efficiency promotion through incident and emergency handling

*EASYWAY Programme*

The TEMPO Secretariat has prepared the new EASYWAY Programme for ITS funding in years 2007-2013 and bid for approximately 550 MEU support. The EASYWAY programme is still being developed; details of proposals are discussed and not finished yet. The objectives should follow the TEMPO programme for the TEN-T.

So far, today are already known the strategic level studies planned:

- Increased safety
- Improvement in mobility
- Reducing pollution
- These shall be reached though following implementation solutions:
- D1 Traffic Information Services

- D2 Traffic Management and Coordination
- D3 Monitoring, processing and data exchange in the infrastructure

*CONNECT Project*

Interest in the development and implementation of ITS has increased in Central and Eastern Europe after the expansion of the EU. The CONNECT project aims to enhance ITS deployment in the region and accelerate cooperation between authorities from new member countries - the Czech Republic, Hungary, Poland, Slovakia and Slovenia. Austria, Germany, and Italy are the relevant partners from EU15. CONNECT is a three-year programme, divided into three annual phases.

The most important aspect is to enable the new central states to ease the co-operation, via the projects, in ITS area. The technical depend on the evolution of the TEMPO programme. CONNECT is a very cost effective project. The implementation and study programme will deliver positive results quickly and cheaply. Stimulation of investments in (national) ITS infrastructure is one of the added values of the CONNECT project.

Integration of the new EU members into ongoing European initiatives may be enabled. Stimulation of co-operation between the CONNECT partners and the existing projects of the TEMPO programme and related working groups (e.g. TMC Forum, DATEX2 Technical Committee) is in process.

There are projects, under CONNECT, to foster the 'interconnect ability' of transport modes to achieve inter-/multimodal door-to-door services. Improving interoperability between national EFC systems with pre-conditions for interoperable road user charging is expected.

One of the main aims is the harmonisation of national system architectures to avoid new borders between the CONNECT member states as result of non-interoperable national telematics systems.

## DG REGIO

The Regional Policy Directorate-General aims to assist the economic and social development of the less economically advanced regions of the European Union. Supporting regional development is necessary for the whole European Union; promoting the least prosperous regions and overcoming their structural difficulties helps to establish sustainable development.

A key difference in the management of the funds is that they are managed by Member States, not by the EC. The Commission shifts the resources to 'general themes' and the Member States allocate the funds, based on the Commission's assessment criterion.
The DG Regional Policy offers three major funds of regional support, which are possible to use for transport:

- The European Regional Development Fund (ERDF) operating in all Member States
- The Cohesion Fund assisting environment and transport projects in the 13 Member States, where GDP is below 90% of the Community average, that need higher aid (Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Greece, Hungary, Malta, Poland, Portugal, Slovenia, Slovakia, Spain)
- The Instrument for Structural Policies for Pre-Accession (ISPA) assisting the candidate states

*European Regional Development Fund*

The ERDF is based on Council Regulation (EC) No 1783/1999 of the European Parliament and of the Council of 12 June 1999 on the European Regional Development Fund.
This fund helps to take structural changes and solve basic problems in the regions with laggard or even declining regions. It finances infrastructure or employment enhancing, through supporting of small or middle enterprises, and science and research.

These actions are divided into three main activities:

- Convergence
- Competitiveness and employment
- Territorial cooperation

The Regional Development funds can be funded up to 25% of total costs.

*Cohesion Fund*

In the same year as the Maastricht Agreement, the Cohesion Fund was established as a tool of solidarity, to help economically weak countries to fulfil the so-called Maastricht criteria. The Cohesion fund:

- Provides support on the national level
- Finances directly the particular project
- Finances "great infrastructural projects" in the environment and transport areas (minimum 10 MEU)

When financing projects, overlapping of support from the Cohesion and Structural funds is not allowed. Investment in infrastructure can be financed through two programmes – Transport and Environment. Here, as in the only one, support from ERDF and Cohesion can join in order with EU policy on cohesion. This is also another way to finance multimodal transport investment, e.g. in terminals.

Transport investment has a high priority in the Cohesion budget, where up to 50% funding can be obtained.

*PHARE program*

PHARE is another EU Pre-Accession funding tool. Experience and knowledge earned through PHARE (planning, implementation, monitoring and evaluation) continue to be of benefit, after EU enlargement,.. Staff involved in the administration of PHARE management often work on the Transition Facility and later also other EC funds.

PHARE was established in 1989, originally only for Poland and Hungary, but later also for other candidate states, now including Bulgaria and Romania.

In 1997 there was a reform at PHARE. Since 1998, PHARE is oriented to support areas mainly focussed on maintaining set-up priorities for access to EU. There are four basic categories of PHARE programmes:

- National PHARE programmes include or everything the projects directly focused on preparation of membership. Very important part of the national programmes is the pilot investment projects, which set-up and assess structures for future participation in structural funds.

- Cross-Border Co-operation (PHARE CBC) programmes, which are preparation for participation in INTERREG III activities.
- Multinational programmes, which are prepared by the EC, but their implementation is under the responsibility of particular states (e.g. LSIF, PPF, ACCESS 2000, Consensus III, etc.)
- Multinational programmes, which are prepared and implemented directly by the EC (e.g. Tempus, ACCESS, etc.)

Some of these activities are still finishing in the new EU25 countries. For the future, some other activities under ISPA programme are being prepared.

## ISPA - Instrument for Structural Policies for Pre-Accession

This fund has been prepared to assist the candidate countries to improve their conditions. The PHARE orientations were further refined in 1999 with the creation of SAPARD and ISPA, where infrastructural projects in the environmental and transport fields, under ISPA, allow PHARE to focus on its key priorities that were not covered by these fields.

ISPA focuses on areas of environment and transport. Its goal is to ease implementation of "acquis communautaire" (legislative requirements of the EU) in candidate states up to the day of association. Projects have to support implementation of EU environmental legislation. Transport is focused mainly on TEN-T. Projects must be in harmony with strategies for ISPA prepared by national Ministries in these two areas.

ISPA deals with projects with international impact on the EU level, which means for example the highest level of national transport networks. ISPA is sometimes also called „pre-cohesion fund“, because of the goals and methods used. So in this easier way, the new countries can learn how to use the cohesion fund in the future, after becoming the Member State.

## Experience learned in functioning schemes

Apart from the EU funds, there are other resources with large sums of money, needed for co-financing of the European projects. Not all the money was possible to use from budgets of the partners, which means, municipalities or infrastructure management and operators. This is very important for large or from other various reason complicated projects.

Of course, it is very important to have prepared the implementation system for administrative of large financial resources. But, it is also necessary to be well prepared to keep within the technical and economic parameters of Funds, where there are also rules, for example, on setting public commissions.

In general, the contracts must be designed according to both national and European legislation, and be harmonized. Experience on PPP area seems to be much sought after for the future procedures, because that type of co-financing can be the way to access the programmes.

## Barriers and solutions for New Member States/Accession Countries

Training and education, launching specific initiatives or expert institutions for programmes or projects regarding administrative needs of EU funding is have all helped to minimize failures both in preparing proposals and in administering ongoing projects. Below, are

presented, for example only, various types of obstacles and solutions adopted in some New Member States.

The help needed for administration can be provided in different forms. Below, some examples of such initiatives can be found.

*Education barriers: Project „Education of non-profit organizations on Structural funds of the EU“*

For candidate or new states, it seems to be very important to have right information. That is why the Czech administrative has prepared an educational programme, few years ago. In the frame of PHARE, there is possible to organize trainings focused on problematic of funds and their usage. Actually, they can be aimed at the preparation and management of the projects linked with thematic of priorities in the national development plan and the regional program, and their practical applications. The target group of particular courses were usually people from non-profit organizations. The main goal was to improve the expert potential for utilization of pre-access tools and then of structural funds in non-government sector.

*Geo-political barriers: Neighbourhood Programmes*

Example from Poland–Belarus –Ukraine area:
This example is shown to highlight the possibility of cooperation of EU and non-EU countries at the Northeast part of Europe, although that it is not directly focused on transport. To strengthen the cross-border institutional cooperation, the Managing Authority and the Joint Technical Secretariat of the Neighbourhood Programme Poland – Belarus – Ukraine are seeking for proposals for co-financing cross-border co-operation projects on the Ukrainian and Belarusian borders. Financial assistance is granted by the European Regional Development Fund under the EU initiative INTERREG and the TACIS cross-border Co-operation programme of the European Communities.

*Organizational obstacles: Specific support institution*

Czech example:
The IREAS, Institute for Structural Policy is a non-profit organization, formed as a project-based platform of academic and policy experts. IREAS was established in 2001 with the aim of initiating and coordinating the cooperation of experts and institutions in research and its practical application into EU policies, particularly environmental and structural. Experts from different universities and other academic institutions, policy experts, state administration and private enterprises are characterise IREAS. IREAS also investigates the potential for public-private participation. There is a strong background in preparing and organizing educational programs, conferences and seminars, too.

*Organizational obstacles: Specific support initiative*

Czech example:
Initiative Juspers is a know-how support. This initiative should lead to better proposals and higher success in calls. The initiative is asked for help, when, at the planned project, some procedure problems are anticipated. Usually, those are the largest projects, including transport area.

*Co-financing from other sources*

Transport systems generally need significant investments. Hence, it is seldom possible to use only one resource. National budgets, common bank advances and, in some cases, also private capital are used to complement the EU funds.

## State aid

The procedure and rules for the State aid are defined by Council Regulation (EC) 659/1999 and by Commission Regulation (EC) 794/2004. All the Member States accepted these procedures and rules, which must be applied European wide:

- Council Regulation (EC) No 659/1999 of 22 March 1999
- Commission Regulation (EC) No 794/2004 of 21 April 2004

In its annex, the Treaty of Accession for the new Member States contains special provisions regarding the authorisation of the State aid for transport. List referred to in Article 22 of the Act of Accession aims on aid schemes and individual aid put into effect in a new Member State also applicable after the date of Accession, and shall be regarded as existing aid within the meaning of Article 88(1) of the EC Treaty.

## Overall Remarks

Transport system investments generally are commonly financed using the following sources:

- Public national funds
- Common bank advances
- Private capital
- EU funds

Based on the findings and analyses conducted, it seems that the most appropriate ways of the EU funding for aims of the FREIGHTWISE project are as:

- European Regional Development and Cohesion funds for “hard” infrastructure
- Marco Polo for modal shift from road
- EASYWAY for support of ITS solutions on the TEN-T network
- ISPA funds for candidate countries

These sources are usually combined, if this is allowed both at the national and EU level, for optimization of resources.

The EU funds availability could be also an additional factor for increasing the investment attractiveness for the private sector. The time horizon of currently planned financial support extends util the year 2015; some of the funding mechanisms were only at the stage of rules definition or are just beginning, as in the spring of 2007.

## THE IMPACT FROM HIGHER SECURITY REQUIREMENTS ON THE INTERMODAL MARKET

There are relevant insights regarding the application of the new security initiatives and their effects on the maritime transport and in the overall logistic chain,The information provided derives from the experience of the logistic chain actors in general (and the maritime stakeholders in particular) since the introduction of the new security regulations.

A first important conclusion is that the application of the security initiatives did not provoke the much feared disruption in the logistic chain. Despite the demanding standards of some measures and the initial difficulties experienced, the stakeholders showed an significant capacity to adapt to the new challenges. General improvements in communications, electronic document submission and investments in training enabled a smooth transition.

On the other hand, the prospect of further security investments and the issue of sharing those costs amongst the different stakeholders of the logistic chain are causing much more controversy. The position of the stakeholders is, of course, divided between those with the higher investment in security hardware items (ports and terminal operators) and the stream of logistic operators up and down the chain (shipping lines, shippers, forwarders, etc). The debate is centred on whether the security investment costs can be recovered and how.

The further security investments in prospect include the following:

- Port authorities and terminal operators undertake the most costly investments in security, namely related to fencing, CCTV systems, scanners, training, additional security personnel, etc. Arguably, the improvements in port security paid by the port authorities and terminal operators are security in the whole logistic chain and the cost must be shared by all chain stakeholders. Thus, “security surcharges” are passed to the port’s clients in order to share those costs;
- The other actors of the logistic chain also undertake costly security investments: improved information systems, reformed structures and administrative requirements, training, etc. The declared challenge faced by these agents is “to keep the goods flowing on time” despite the potential delays caused by the security regulations. Shippers and forwarder argue that every logistic stakeholder must bear its security cost as normal “costs of doing business”, in the same way as a firm must invest its resources to get a quality certification. Contractual relationships must drive the setting of prices, and surcharges on prices are simply not acceptable.

The global effect of security investments in transport and logistic costs is still to be calculated. All stakeholders agree that the costs may cause significant changes in logistics in the forthcoming years, but it is too soon to foresee them, as companies are currently adapting their strategies to the situation. A potential effect may be that smaller logistic partners (for instance, ports in developing countries) could see their growth hindered due to direct security investments but also due to the insurance premium associated to the terrorist threats.

A key and unresolved question on security is the association between threat level, inspection and “security surcharges”. All security initiatives targeting the logistic chain (ISPS, CSI and C-TPAT) have the same objective but seem to lack of real integration.

For instance, the C-TPAT objective is to attract security committed partners in the whole logistic chain (from the cargo owner to the final buyer) to certain security standards and procedures.

Theoretically, the compliance with those standards should provide a "flow guarantee" avoiding some security procedures and controls. On the other hand, CSI targets the control of containers, irrespectively of its origin (no matter the shipper or forwarder) and sometimes with a policy of indiscriminate "random checks". What is the incentive of cargo owners, shippers and forwarders for undertaking security investments if these efforts are not recognised and their goods can be delayed (and "surcharged") in the same way as those from a 'dodgy' origin? At this moment the "security involved logistic partner" is not properly rewarded by the system and future developments of logistic chain security should go in the direction of linking cargo threat levels to security levels, in terms of barriers and costs imposed.

Most of the investment should be focused on multimodal transport security management enforcing regulations and control capabilities.

The development of the FREIGHTWISE framework should provide an infrastructure for sharing information capable to help the different actors to comply with the security requirements without jeopardising logistics efficiency.

Annex 10 includes more detailed deliberations on the security impact issue.

# CONCLUSIONS

## Overall Considerations

The result of the activity shows an increasing interest in intermodal and multimodal transport that is not supported by numbers (the % of growth of intermodal transport is low with respect to the growth of road and sea). One of the possible factors is the fragmentation of services provided, that to date has not permitted standardisation and greater efficiency of the distribution costs.

ICT solutions are relevant for many aspects (information flows and planning, modelling and organisating transport chains) while the level of adoption is low except for very large companies.

A framework that could permit SMEs to play a role in the logistics and transport world together with big player could contribute to the wider dissemination of services and to a general growth of knowledge about processes and communication mechanism.

The Freightwise framework should support process interoperability, software interoperability and chain actor profiling according the old and new roles on the chain.

As things now stand, the adoption of intermodal/multimodal goods transport faces a certain number of hurdles. A change of mode during a journey is more a change in system than a simple transhipment operation. The resultant friction costs have an impact on the competitiveness of intermodal/multimodal transport. These elements result in:

- higher prices (due to friction costs);
- longer journeys, more delays or less-reliable deadlines;
- lower availability of quality services;
- restrictions on the type of goods;
- a greater risk of cargo damage;
- more complex administrative procedures.

There are clear “inabilities” to interconnect the different modes at the following levels:
1) infrastructure and transport equipment:

- the lack of consistent networks and interconnections (missing infrastructure sections, for example), loads transfer costs onto the operators;
- each mode within the current system is financed and managed separately. The responsibility for strengthening the links between those modes is thus difficult to establish;
- the inability to operate between modes, such as differing railway signalling systems, causes problems;
- the differing sizes of load-carrying unit between one mode and another are not harmonised;

2) operations and infrastructure use, and in particular that of terminals:

- certain services such as vehicle identification or product information systems are unavailable in intermodal situations;
- the various transport modes give unequal performance and service quality;
- commercial information and practices are not always coordinated among the various modes;

- terminals cannot always adapt to train and ship timetables that are operated round the clock, while the working hours of drivers and crews are not always suited to intermodal operations;
- the timetables for the various modes are not harmonised;

3) services and regulations aimed at individual modes:

- the absence of harmonised electronic communication systems among the various operators within the intermodal sequence prevents adequate scheduling;
- where cargoes are damaged the responsibility is difficult to establish, since the various transport modes involved are governed by different international conventions;
- administrative bottlenecks impair the competitiveness of intermodal transport.

Faced with this situation, the European Commission advocated a certain number of approaches towards promoting multimodal/intermodal transport in Europe. The aim of integrated infrastructures and means of transport is to have a network of infrastructures and transfer points that are consistent at European level in order to ensure that the various modes can interoperate and interconnect.

In order to do this the Commission decided to boost the intermodal configuration of the TEN, to support the provision of logistical services that have added-value potential at the transfer points; to guide the process of harmonising the load-carrying units (dimensions and weights).

Intermodality is a quality indicator of the level of integration between the different modes: more intermodality means more integration and complementarities between modes, which provides scope for a more efficient use of the transport system. The economic basis for intermodality is that transport modes, which display favourable intrinsic economic and operational characteristics individually, can be integrated into a door-to-door transport chain in order to improve the overall efficiency of the transport system. The integration between modes needs to take place at the levels of infrastructure and other hardware (e.g. loading units, vehicles, telecommunications), operations and services, as well as the regulatory conditions.

Intermodality is not bound to certain modes. It is a trading and mobility issue in which rail, water, air and road are called on to contribute to the optimisation of the whole, where they are supported by advanced information and communication services. At the level of transport operations, new services, information and communication technologies will improve the utilisation of the existing capacities.

Intermodality is clearly not about forcing a specific modal split. However, by improving the connections between all modes of transport and integrating them into a single system, intermodality allows a better use to be made of rail, inland waterborne transport and short sea shipping which, by themselves, in many cases do not allow door-to-door delivery. Intermodality is, therefore, complementary to other EU transport policies such as liberalisation of transport markets, developing the TEN-Ts and the promotion of fair and efficient pricing.

Looking at a generic framework supporting the Intermodal/Multimodal chain, the FREIGHTWISE project could support the reform processes of transport and logistics markets providing a way to minimise costs and enhance competitiveness of different actors just because of a standardised approach.

The context for a more efficient approach to different modal optimisation is ideally set within a programme of overall trade process reform. The following are highlights of a model for trade process reform:

- to reform port processes; to automate processes; to introduce port management and control ICT systems; to create paperless ports; to create communities among ports and port communities; to realign the roles of the Port Authority, the port community and port users.
- to upgrade Customs processes and ICT systems in order to take advantage of electronic commerce and paperless customs operations;
- to implement electronic exchange of trade information between the port, Customs, trade professionals and the trader so that information is exchanged immediately and accurately;
- to re-engineer Customs work practises to reflect the changing role of Customs from a "police" mentality to that of a trade facilitator and business partner.
- to use technology (e.g.: install container scanners) within a Customs area outside the port gates, in order to scan sealed containers. Containers will remain sealed in all but the most extreme cases; To implement pre-clearance by exchanging electronic information before goods arrive;
- to implement pre- and post-event auditing, whereby trusted trading partners are able to declare origin and consignment details to the satisfaction of Customs and the relevant technical control agencies. As a result, the importer, and his goods, may be audited infrequently by a Customs investigation/audit unit on the importer's premises instead of physical inspections at the port.
- to add the concept of "risk management" to the Customs IT clearance systems, so that the history of trading partners may be used to asses the risk of lost revenues and fraudulent information in advance of any declaration.
- to establish a Customs Training Institute in order to set new minimum standards of professionalism and competence within the Customs service and the trade professional. This institute will offer formal qualifications, without which trade professionals will be unable to submit information to Customs in the future.
- to overhaul the system of trade laws and regulations so that new legislation may be enacted to make possible the legal exchange of electronic information, electronic signatures, a reengineered IT based Customs and port environment, electronic payments and electronic funds transfer techniques.
- to establish a national trade process reengineering and IT/electronic commerce project management entity which will also provide the technology, expertise and the neutral and autonomous forum for cooperation between all of the participants in this major project.
- to establish a "one stop shop" where all remaining technical controls may be issued to traders, and paid for, within a single visit.
- to develop the ICT systems of this "**one stop shop**" so that technical controls may ultimately be applied for and issued electronically and so that risk management principles may be adopted by each of the technical control agencies.
- to develop specific normative context for multimodal transnational chains in which company liability would guarantee the different actors of the market.

## ICT Specifics and FREIGHTWISE

In recent years the market of innovative EDI and WEB services dedicated to transport and logistics has been in continuous evolution, and it is possible to identify two main emerging clusters:

- portals created by the most relevant logistic operators, through which these actors offer added services to their clients besides the core service, represented by the transport of goods;
- independent portals offering innovative services like the exchange and sharing of data and information following specific parts or complete transport chains.

The first type of portals, developed by the worldwide biggest freight forwarders, shipping lines and express couriers, are proprietary solutions, which give the possibility to track and trace the freight flows only for transports completely organized by those actors. These solutions do not respond to the growing demand of interoperability among different ICT systems, and furthermore exclude small and medium sized enterprises (SMEs) from the opportunity to offer similar services, as the development costs of proprietary systems are too high.

The second type of portals seems to be more in line with the needs of interoperability and the requirements of SMEs. In this context many initiatives have been launched with different results in terms of utilization and client satisfaction. So far there is no leading portal creating a sort of common standard, and therefore many alternatives remain open.
A new portal will enter into an immature market, characterised by open opportunities and, at the same time, relevant risks.

In any case operators involved in logistic chains need an electronic infrastructure to share information and services in order to enable effective and efficient e-business processes. Furthermore intermodal/multimodal transport poses strong challenges, as it requires collaborations among a huge number of operators.

The period is a crucial moment with a big opportunity because:

- companies (SMEs) are ready to listen to proposals aimed at improving efficiency and effectiveness;
- there is a lack of information, examples of best and worst practices, advice on which tools to adopt, which should be filled;
- the gap between the e-opportunity and the e-reality needs to be bridged, in order to reach practical and relevant benefits.

Until now most of the independent portals have played a minor role in the exchange of data connected to freight transport (e.g. e-documents), as there is a lack of standardisation in terms of contents and used formats, developing alternative value adding solutions like market-places, which could guarantee sufficient resources for the survival of those initiatives.

The diffusion of wireless technologies and the growing use of mobile connections (GPRS, UMTS), will boost and facilitate the electronic data and information exchange, providing further opportunities to EDI initiatives.
Therefore it is necessary to be continuously aligned to the emerging standards and technologies, in order to be ready to profit form the opportunities offered by this immature and growing market.

The main aspect for next generation tools is related to **INTEROPERABILITY** among existing EDI and WEB services in terms of technical standards, process interoperability and data representation.

It is envisaged the creation of a large community of users (big players, public bodies and companies) sharing relevant information about the potential demand and services in transport

and logistics through a dedicated network of interoperable applications able to enhance the effectiveness and efficiency of existing business processes.

## LIST OF ANNEXES

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