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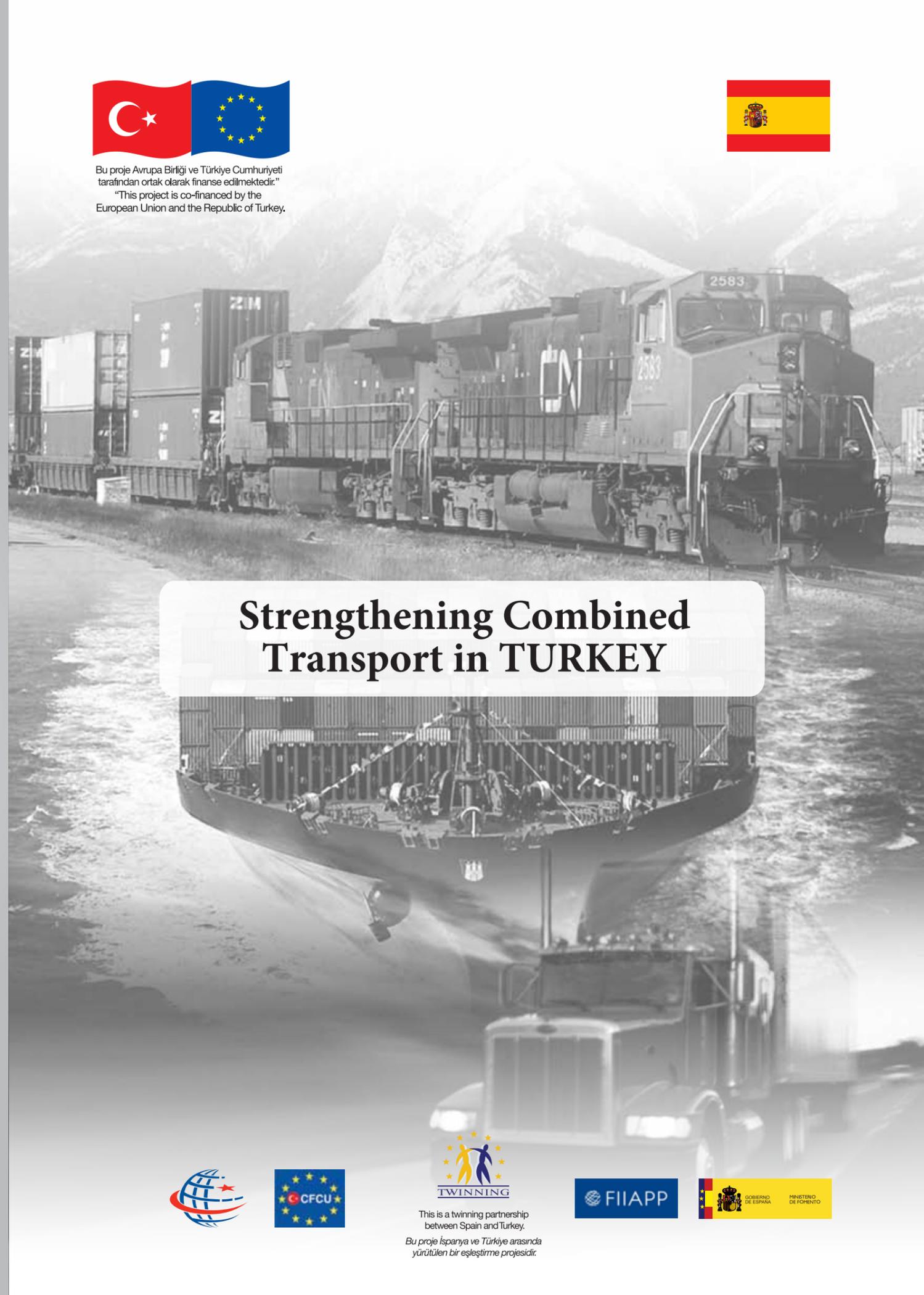
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Strengthening Combined Transport in TURKEY





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Component 3:
**Turkish Combined
Transport Strategy**

Executive Report

November 2013



COMBINED TRANSPORTATION STRATEGIC PLAN IN TURKEY: BASIS

By the year 2023, Turkish exports will reach the figure of \$500 billion. This significant economic dynamism requires that the country develop the entire infrastructure it needs to achieve its goal.

This infrastructure encompasses combined transport, which is to play a fundamental role in this unprecedented economic expansion. Given the large capacity of the transport sector, the country must abandon its overwhelming dependence on road transport, which has a market share in the movement of goods and passengers exceeding 90% of the total.

There is an urgent need to launch combined transport initiatives that ensure a balanced, integrated use of all modes of transport. Internationally the assumption is that a transport system that depends exclusively on road transport is unsustainable in the medium term owing to growing congestion, negative external factors and the impossibility of guaranteeing the levels of safety and efficiency required by the growing volume of traffic.

The purpose of this Strategic Plan for Combined Transport in Turkey is to define and start up an integral transport system balancing the different modes of transport, which requires investment, legislation and improvements to operations in railways, shipping and logistics.

The strategic planning of combined transport in the country is defined as *"the continuous process of adopting decisions in the present with the greatest possible foreknowledge of their future character, to optimise positioning in world logistics chains"*.

Strategic planning works as an instrument for coordinating the government's policies and plans with the actions that are to be taken in the Multimodal Transport Sector, defining the steps necessary for checking the three aforesaid processes against the quality and productivity standards demanded by customers.

Turkey has made a commitment to intermodality and combined transport as one of the key factors for consolidating economic growth and using the country's geo-strategic location as a world-class logistics platform. In short, to design an combined transport system that meets the above requirements.

Accordingly, Turkey must draw up a comprehensive strategy for the development of combined transport that, verifying the integration of the three key processes, pursues the following national goal: to establish the approaches so that the country has an integrated multimodal transport system that improves access to the national and international markets for products as well as access to public services for individuals, guaranteeing the optimisation of the country's competitive position.

COMBINED TRANSPORT

Globalisation requires all economies that pursue sustainable development to have competitive transport systems. Transport represents the balance between being or not being in the ultra-competitive game of global businesses.

The combined transport system is currently based, fundamentally, in the movement of containers derived from the activities of foreign trade. This form of transport, technologically supported in combined movements with door-to-door services, emerges from a commercial and legal point of view through a single contract to one multimodal transport operator, a contract that gives full responsibility to the whole process.

Combined goods transportation needs institutional backing to give it impetus, which can characterise it and provide it with the essential facilities for direct ("through") transport on the various segments and terminals. This support has materialised in different nations in the *"single transport document"*, required for the movement of each shipping unit and constitutes evidence of the Single Transport Contract.

This contract represents the responsibility assumed by a single multimodal transport operator to the owner of the goods and includes payment for the single freight, single insurance, customs clearance, fees and other expenses included in "door-to-door", "overall" or "total" transportation.

The multimodal transport of goods, consequently, consists of the use of two or more transport systems on its various segments, with the issue of a single transport document by the combined transport operator, valid for the whole journey from door to door, which does not prevent or exclude the right of the transporter of each modality to also issue their own Bill of lading (road, rail, B/L, AE/B), corresponding to the section made on the entire route.

Of all the benefits generated by the resource to combined transport, that of cost reduction stands out above the rest, an aspect which focuses on two areas:

- ✗ reduction of **social costs**: road safety, air pollution, acoustic contamination, energy and raw materials consumption...
- ✗ reduction of **infrastructure costs**: reduction of road traffic, with consequent decreases in congestion and better use of the actual capabilities of the transport systems.

Cost is the most relevant factor at the time of making a modal choice, and companies choose the transport most suitable to their logistics structure.

Combined transport is considered less flexible and is not chosen by companies requiring short transit times.

Any strategy in Turkey for developing combined transport will have to materialise in two areas:

- Design of a network of infrastructures that maximises the generation of savings in transport and storage costs through intermodality resource.
- Integration of transport chains and logistics with production chains, ensuring integration of existing ones and producers with the needs of customers within a framework of mutual collaboration and cooperation.

TURKISH COMBINED TRANSPORT STRATEGIC PLAN

The preparation of this Strategic Plan for combined transport in Turkey has been developed in accordance with the following stages:

- reflection on the objectives and future possibilities of said transport modality;
- analysis of the opportunities and threats in the international competitive environment to the development of combined transport in Turkey;
- identification of the internal strengths and weaknesses existing in Turkey launching said form of transport effectively;
- evaluation of the competitive position of combined transport in Turkey on the international stage; and
- definition of the desired future configuration of combined transport in Turkey and the most suitable lines of action for achieving the strategic targets that set.

The methodology used is shown in the following diagram:



Graph 1: Methodology for Turkish Combined Transport Strategic Plan

The plan for the development of combined transport in Turkey is strategic, not operational.

A strategic plan consists of analysing the scenario, sector trends and definition of the vision (what is desired in the future) to then define the strategy: what has to be done to achieve this vision and the rest of the strategic development until the action plan is achieved.

DEVELOPMENT OF THE STRATEGIC PLAN FOR COMBINED TRANSPORT IN TURKEY

1.- STRATEGIC DIAGNOSIS

1.1.- ENVIRONMENT ANALYSIS

According to the World Economic Forum (WEF) ranking, Turkey is in 43rd place in terms of the development of infrastructures (transport and communications): The WEF infrastructure index evaluates various issues, in which transport plays a leading role (70% of the value of the measurement). The factors that are evaluated are as follows:

- Road quality
- Railway infrastructure quality
- Port infrastructure quality
- Air transport infrastructure quality
- Quality of the power grid
- Quality of the telecommunications network

1.2.- INTERNAL ANALYSIS

Turkey has a privileged geo-strategic location, which is an extraordinary comparative advantage. This physical configuration situates the country as a platform for economic, social and cultural exchange between Europe and Asia.

These investments seek to contribute to the development of the combined transport network in Turkey along the east-west and north-south axes.

The network of highways has been developed significantly and the highway length now stands at 64,865 km, of which 2,080 km are motorways.

In the past, the Turkish transport system has invested mainly in the generation of infrastructure for land transport.

Accordingly, the country has one of the largest land transport fleets in Europe.

At the present time, 95% of passengers and 90% of goods are transported by road.

Turkey has a competitive advantage in maritime transports in that it is surrounded by the sea on three sides (Mediterranean, Aegean, and Black Sea), together with the straits of the Dardanelles and the Bosphorus encircling the Marmara Sea. The length of Turkey's coastal borders is 8,333 km.

Maritime transportation is the most popular method of transportation for Turkey's exports and imports, with respective shares of 50.7 percent and 53.2 percent in total.

This is followed by road transportation, with a share of 40.3 % of exports and 22.9 % of imports.

Turkey has 10,984 km of railways, operated by the General Directorate of Turkish State Railways (TCDD). Since most of the railways have been in use for quite a long time, the Turkish government is aiming to modernize the system through various projects.

However the main problem is that most of the existing railway network was constructed long ago, curve radius is very low and it is not adapted for the use of modern technology.

In order to improve combined transport Turkey needs regional, national and international level planning and, in regional level, Turkey is due to accelerate border crossings procedures.

A key point for the Turkish combined transport development is that the main demand of the railway customers refers to punctuality of the service, but TCDD may not always satisfy them.

In 19 points, TCDD is building logistic centres close to relevant cities. TCDD elaborates the construction plan and define with local stakeholders the area for logistic centre.

A key point for the Turkish combined transport development consists of specializing centres in some kind of goods is an imperative. The centres have to be put in place in corridors to contribute to their efficiency and productivity.

The logistic sector plays a key role in the consolidation of the combined transport.

There exist a serious confusion about logistics as a whole sector due to the no definition of general policy of logistics centres even in Strategy Papers. After clear definition of Master Plan, brief law can be issued defining very few issues such as incentives.

There are investors (road transporters- truck companies- and logistics companies) highly interested but at the same time confused with which institution or how many institutions should be applied for the licenses necessities for putting in place a logistic centre.

Besides, a key point for the Turkish combined transport development is the need of a Transport national master plan taking into account different characteristics of regions.

1.3.-SWOT ANALYSIS

The SWOT matrix described on the foregoing pages can be summarised as follows:

Strengths:

- Geographical configuration of Turkey as a logistics platform between Europe and Asia.
- Road transport sector with size and experience.
- Turkish ro-ro shipping sector that is consolidated and well-positioned in its area of influence.
- Active presence of multinational logistics companies.

Weaknesses:

- Obsolescence of certain shipping and railway infrastructures.
- Lack of a National Logistics Plan to define corridors and the locations of centres.
- Presence of players that are not fully professionalised in road transport.
- Competition based on negotiations with customers to agree low prices.

Opportunities:

- Maintenance of expectations for growth of transport worldwide.
- Growing, sustained economic development of Turkey up to 2020.
- Growth of Turkish production sectors.
- Programmes for the modernisation of railway infrastructure already in progress.

Threats:

- High volume of investment required.
- Gradually radicalised international competition.
- Disorganised emergence of new logistics centres.
- Goods loading/unloading procedures far in excess of those desired by customers.
- Disconnection of customs procedures and transport operations due to complex operational procedures.

In summary, it can be said that the route towards intermodality in Turkey shows the following characteristic features:

- it is based on evidence: the geo-strategic positioning of the country as a logistics platform between the flows of traffic (Asia-Europe-Africa);
- it has been progressively equipped with first class infrastructures in the road sector and projects have been defined to prevent bottlenecks which make international transit difficult;
- it maintains an outstanding maritime operation;
- a privatisation process of its ports has been started in order to move to efficiency and;
- it begins to cover the country's rail operation requirements.

2.- PREPARATION OF STRATEGY

2.1.- MISSION

“Contribution to improvement of Turkey by formulation of policies, regulations, plans and projects that guarantee a National Combined Transport System based on a Transport and Infrastructure network with international quality standards comply with economic, social, environmental guidelines and national development plan”.

2.2.- VISION

To be the main line of national and regional development through the efficient management of national and international goods flows and their operation from combined infrastructure and logistics with high standards in efficiency and quality.

The vision of combined transport in Turkey must contribute to the national challenge for the year 2023, which marks the centennial of the Foundation of the Republic.

2.3.- VALUES OF COMBINED TRANSPORT IN TURKEY

The values highlight the fundamental and characteristic features of the Turkish Combined Transport System, constituting a point of reference and roadmap for its operation.

These are the values:

- Service: provide Turkey and the Turkish people with transport services that improve their quality of life.
- Quality and continuous improvement: meet and exceed universal standards.
- Free competition: guarantee and maintain rules for competition, protecting the rights of customers and citizens.
- Openness: accept and adopt new ideas, proposals and focuses in ways of doing combined transport to optimise service levels and answering the country's needs.
- Efficiency: achieve the programmed targets and goals using the resources available in a set time, improving the capacity for achieving said targets and goals in terms of place, time, quality and quantity.
- Effectiveness: optimise the rational use of the resources available with proven operating models.
- Loyalty: fulfil and ensure fulfilment of the Mission, Vision and Values above private interests.
- Participation: enable participation of stakeholders and ensure the protection of their investments.

Transparency: prepare, maintain and distribute information and statistics about goods and traffic flows.

3.- STRATEGIC PLANNING

Identified from the SWOT analysis, critical success factors constitute the key elements to ensure that combined transport fulfils its mission and covers the operational objectives specified in the strategic map.

Compliance with these factors enables the consideration of strategic alternatives that will define the future of combined transport in Turkey.

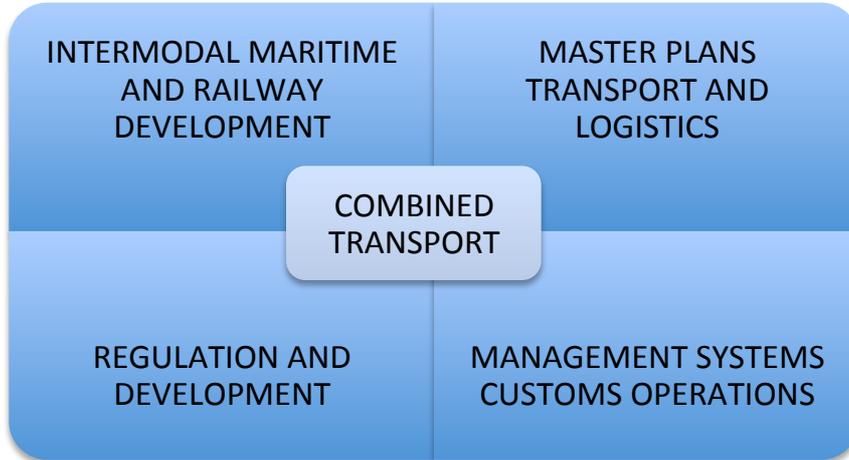
This is a non-comprehensive exhaustive list of all the issues that need to be addressed by combined transport in Turkey.

They are as follows:

- Institutional coordination of intermodality.
- Model for studies of goods and traffic flows.
- National system for the distribution of transport statistics.
- Origin-destination matrices according to producer region and traffic area.
- Combined transport infrastructure map.
- Master Plan for Transport on a national scale, taking into account regional particularities.
- Bilateral cooperation agreements with neighbouring and coastal countries for the promotion of combined transport.
- Model for incentives for combined transport: supply, demand and barriers.
- Single contract for combined transport.
- Connectivity of ports with logistics centres.
- Solution for congestion in the area of Istanbul.
- Optimised railway infrastructure.
- Amendment to legislation on weights and road traffic regulations.
- Methods for optimising land intermodality.
- Delimitation of border points for imports.
- Logistics Sector Law.
- Logistics map of Turkey: corridors, centres, dimensions.
- Railway logistics centres integrated in production chains.
- Specialisation of combined and logistics centres.
- Intermodality operation models (in shipping and railways) that confirm customers' requirements and the geographical and economic demands of production chains.
- Reduction of combined operating times, unloading and loading throughout the chain.
- Model for optimising cabotage services, drawing up a policy for promotion.
- Combined transport management systems.
- Development of short sea shipping.
- Port Community System.
- Customs procedures in line with combined operating requirements and customers' expectations.
- One-stop window system.

4.- STRATEGIC OBJECTIVES OF THE TURKISH COMBINED TRANSPORT SYSTEM

The Turkish Strategic Plan for Combined Transport is developed in the following four priority strategic objectives issues (areas of priority action):

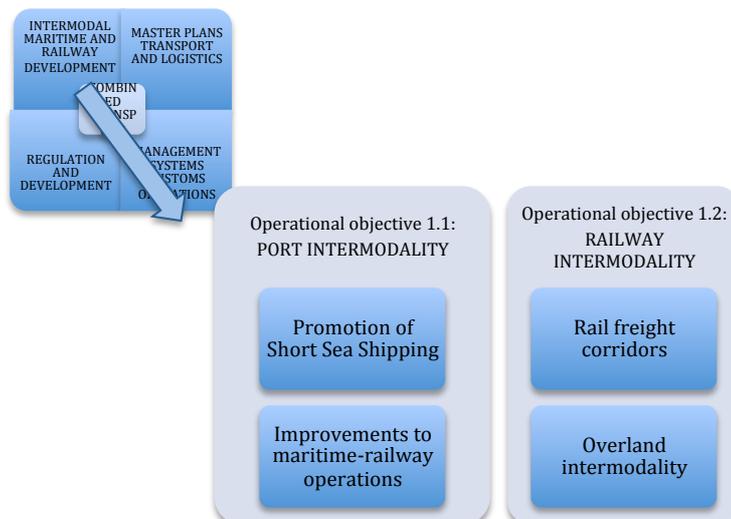


Graph 2 : Turkish Combined Transport Strategic Objectives

5.- DEFINITION OF THE OPERATIVE OBJECTIVES OF THE TURKISH COMBINED TRANSPORT SECTOR

From the interaction between the four strategic priority areas of the Combined Transport in Turkey and the issues analysed on the SWOT matrix, a series of operative objectives or action lines, have been obtained in order to support the strengths and opportunities of this type of transport as well as diminish its weakness and threatens.

STRATEGIC OBJECTIVE 1: INTERMODAL MARITIME AND RAILWAY DEVELOPMENT



Graph 3 : Turkish Combined Transport Strategic Objective 1: operational objectives

OPERATIONAL OBJECTIVE 1.1 PORT INTERMODALITY

Seventy-three percent of Turkey's exports and 94% of her imports are moved by sea.

Having said this, although this mode of transport is the most important in Turkey due to the volume of goods that it moves, if one takes a closer look at the data regarding the transportation of the country's domestic national traffic, its roads have played a dominant role with respect to port-to-port transportation ever since the 1950s.

The data speak for themselves: taking 2010 as our base, 89.4% of goods and 91.7% of passengers were transported in Turkey by road.

To sum up, the proposal is as follows: given the current situation of her transport system, Turkey must seriously consider Short Sea Shipping as a viable alternative to tackling the problems being caused by the mode of transport presently being used to move domestic goods around the country.

ACTION PLANS OF OPERATIONAL OBJECTIVE 1.1

The Turkish Port Intermodality Improvement Plan is implemented in the following action plans:

1.1.1.- The Promotion of Short Sea Shipping

1.1.2.- Sea-Rail Operational Improvement.

OPERATIONAL OBJECTIVE	PLAN OF ACTION	LINES OF ACTION
1.1.- MARITIME SECTOR	1.1.1. Boost for short distance sea transport	1.1.1.1.- Analysis of the commercial flows amenable for using Turkish short sea shipping (SSS) routes
		1.1.1.2.- Study of the Current Short Sea Shipping Supply in Turkey
		1.1.1.3.- Identification and selection of SSS routes as per model of optimization of the volume of traffic and general cost of transport.
		1.1.1.4.- Formulation of routes and scenarios: endowment of infrastructure and superstructure needed and investment required for the routes selected. Services to be provided
		1.1.1.5.- Definition of a country level model so as to examine the economic and social feasibility of a SSS route
	1.1.2. Land-Sea Operational Improvements	1.1.2.1: Establishment of a Technical Commission for port-rail intermodality
1.1.2.2.: Fomenting of public-private dialogue		

Table 1: Action plans and lines for Operational Objective 1.1

Plan 1.1.1: The Promotion of Short Sea Shipping

The European Union defines Short Sea Shipping as the movement of goods and passengers by sea between ports situated in Europe or between non-European ports located in nations whose coastline forms a frontier with Europe.

Short Sea Shipping involves the development of international and domestic maritime transportation, including feeder services along the entire coastline as well as to and from islands and lakes and up and down rivers.

Bearing in mind her more than eight thousand kilometres of coastline and over 300 ports, in Turkey Short Sea Shipping can provide a complementary and efficient solution to the extremely dominant and contaminating movement of goods by road.

It must be stressed that the fact road transport does not require customs procedures represents a disadvantage for Short Sea Shipping with respect to the dominant modality.

To avoid this drawback the Short Sea Shipping operators must guarantee that any customs procedures (applicable to Short Sea Shipping) are simple, fast and integrated with the documentation used in road transportation in order to prevent these procedures from hindering the implementation thereof.

In short, the **promotion and implementation of Short Sea Shipping in Turkey** will require analysing the viability of developing ad hoc lines for the freight traffic flowing between ports that replace the traditional road routes presently dominant within the country.

Based on the results of this analysis of the viability of possible and different routes, the steps that need to be taken in order to guarantee the development of Short Sea Shipping in Turkey shall be planned to help towards eliminating many of the long-distance road routes and thereby reducing times and costs, in short to ensure the implementation of an efficient combined transportation system.

It is highly recommendable to reinforce the Turkish Centre for the Promotion of Short Sea Shipping and to provide it with contents, thereby assigning it with responsibilities with respect to the development of this Plan.

This Plan is built around the following lines of action:

1.1.1.1.- Analysis of the trade flows likely to move along Turkish Short Sea Shipping routes

1.1.1.2.- Study of the Current Short Sea Shipping Offering in Turkey

1.1.1.3.- Identification and selection of Short Sea Shipping routes in accordance with traffic volume optimisation model and generalised transportation cost.

1.1.1.4.- Formulation of routes and scenarios: allocation of necessary infrastructures and superstructures and investment required for the routes selected. Services to be rendered

1.1.1.5.- Definition of a countrywide model for analysing the economic and social feasibility of a Short Sea Shipping route

1.1.1.5.1.- Analysis of possible actions within the port rates and fees regulatory framework with respect to the new proposed Short Sea Shipping routes

1.1.1.5.2.- Proposed financing formulas for the endowment of infrastructures and superstructures that make the creation of a Short Sea Shipping route possible.

Plan 1.1.2: Improvements to intermodal maritime-railway operations.

As a key aspect, fomenting inter-modality at ports confronts the design of the rail terminals and their link-up to the general railway network.

Taking into account that rail traffic has to compete with road transport, the basic objective of the design of terminals and their links has to be that ***the loading/offloading of goods on/off trains must not be more expensive or more complicated than the loading/offloading of goods on/off trucks*** and, if possible, cheaper and more straightforward.

This plan is implemented in the following courses of action:

1.1.2.1: Establishment of a Technical Commission for port-rail intermodality.

The aim of this commission will be to lay down a conceptual and technical framework for the design of rail terminals within ports and their link-up to the general rail network.

Members : Ministry of Transport, Maritime Affairs and Communications and TCDD

Responsibility for coordination of this commission lies with the Ministry of Transport DG for Ports.

1.1.2.2.: *Fomenting of public-private dialogue.*

The setting-up of networks between Government, industry, academic institutions and civil organizations is an essential part of an overview for combined sustainable load transportation.

OPERATIONAL OBJECTIVE 1.2. RAILWAY SECTOR.

In this Operational Objective, the basic working promise is that the viability of the combined transportation services offering has, by default, to involve the implementation of actions aimed at ensuring the efficiency of the rail transportation services provided in the rail freight corridors. Without the implementation of a competitive rail freight offering all the efforts being made to establish a combined rail-road transportation offering shall be rendered useless.

In accordance with the BASIC WORKING PREMISE, the investment and planning efforts being made towards a core-network of rail corridors developed in accordance with the flows of freight suitable for transportation by rail. It will be necessary to define an objective framework of rail freight corridors

ACTION PLANS OF OPERATIONAL OBJECTIVE 1.2.

The action plan of operational objective 1.2 breaks down as follows:

1.2.1.- Rail freight corridors

1.2.2.- Overland Intermodality.

OPERATIONAL OBJECTIVE	PLAN OF ACTION	LINES OF ACTION	ACTIVITY
1.2. RAIL SECTOR	1.2.1. Rail Freight corridors	1.2.1.1 Definition of a target framework for rail freight corridors.	
		1.2.1.2 Strategic reorientation of Turkish Railway Transportation Corporation (Freight)	1.2.1.2.1. Development of a horizontal organization structure based on independent business units. 1.2.1.2.2. Study of feasibility of services tendered: Re-organization, prioritization and cancellation of transport services
		1.2.1.3 Interoperability and integration of Turkish rail networks	1.2.1.3.1. The Marmaray Tunnel. 1.2.1.3.2. Integration of Turkish rail freight transportation into the European Rail Freight Corridors Network. 1.2.1.3.3. External audit of the traffic and safety management systems in the Turkish rail network.
	1.2.2. Land Intermodality	1.2.2.1 Plan for improvement of rail accessibility at production and logistics facilities in Turkey	
		1.2.2.2 Definition of a nodal strategy	
		1.2.2.3 New framework of operation at TCDD-owned Combined Freight Terminals	1.2.2.3.1. Functional separation between infrastructure and operation 1.2.2.3.2. Singularize and disaggregate economic operation by rail facilities 1.2.2.3.3. Management, fare-setting and commercial independence

Table 2: Action plans and lines for Operational Objective 1.2

Plan 1.2.1. Rail freight corridors.

1.2.1.1. *Definition of a rail freight corridor objective framework.*

- ⊙ Determining the forecast demand of freight flows suitable to be carried by train (the potential market for the rail freight transportation sector)
- ⊙ Determine the modal share objective and thus draw up an objective map of rail freight corridors in Turkey

1.2.1.2. *Strategic reorientation of the Turkish Railway Transportation Corporation (Freight).*

1.2.1.2.1. *The development of a horizontal organisational structure based on Independent Business Groups.*

1.2.1.2.2. *Viability study of the services offered: Reallocation, prioritisation and withdrawal of transportation services.*

1.2.1.3. *Interoperability and integration of Turkey's railway networks.*

This line of action involves three principal activities aimed at ensuring the interoperability and integration of the railway networks in Turkey.

1.2.1.3.1. *The Marmaray Tunnel.*

1.2.1.3.2. *Integration of Turkey's rail freight transportation service into The European Rail Freight Corridors Network.*

1.2.1.3.3. *External audit of the Turkish railway networks' traffic and safety management systems.*

Plan 1.2.2. Overland Intermodality.

This Plan is built around the following lines of action.

1.2.2.1. *Railway accessibility improvement plan in production and logistics facilities.*

The need arises to incorporate the study of the rail accessibility of the country's productive and logistics facilities into the requirements of the process of drawing up the logistical map of Turkey.

1.2.2.2. *Definition of a nodal strategy.*

1. No de selection and study of nodes by way of the definition of node, extra-node and inter-node circuit types: load type, times and logistical phase.
2. Determination of the sufficiency and validity of the capacity installed in the nodes.
3. Public-private coordination and negotiation for: The dismantling of current railway infrastructures (terminals and lines). New railway infrastructure projects (terminals and lines).
4. There must be a degree of **parallelism and coordinated action** when it comes to planning the intermodal and rail capacity with respect to the action implemented in the two nodes that make up the corridor.

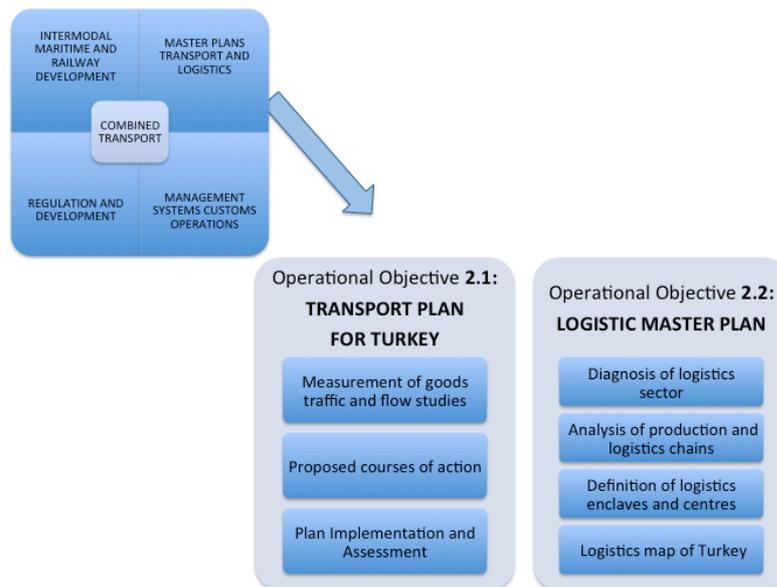
1.2.2.3. *New operational framework in the Combined Freight Terminals owned by the General Directorate of Turkish State Railways Administration (TCDD).*

1.2.2.3.1. *Functional separation between infrastructure and operation.*

1.2.2.3.2. *Singularise and break down the economic operation by railway facilities.*

1.2.2.3.3. *Management, fee charging and commercial independence.*

STRATEGIC OBJECTIVE 2: TURKISH MASTERS PLAN: TRANSPORT AND LOGISTICS



Graph 4 : Turkish Combined Transport Strategic Objective 2: operational objectives

OPERATIONAL OBJECTIVE 2.1 PREPARATION OF THE TRANSPORT MASTER PLAN FOR TURKEY

Interrelations between economic growth and the increase in the demand for transport are multiple and complex. Said demand for transport is a result of the demand for goods and services.

Consequently, one crucial determining factor for future development will be variation in the demand for said goods and services, directly related to the growth of a country's economy.

An analysis of international goods transport reveals a number of trends:

- The volume of goods transported by road has grown more quickly than the GDP, whereas those transported by rail have grown slowly or have decreased.
- Road transport is by far still the mode of transport with the highest share.
- There is a desegregation of the tonnes-kilometre of goods between tonnes loaded and average distance travelled that shows that the contribution of these two variables to the total increase of tonnes-kilometre has varied over time.
However, the increases in the average distance travelled have been the main source of growth in recent decades.

ACTION PLANS FOR OPERATIONAL OBJECTIVE 2.1

The Transport Plan of Turkey comprises the following action plans:

- 2.1.1. Measurement of traffic and goods flow studies.
- 2.1.2. Proposed courses of action.
- 2.1.3. Plan Implementation and assessment.

OPERATIONAL OBJECTIVE	PLAN OF ACTION	LINES OF ACTION
2.1. TRANSPORT PLAN FOR TURKEY	2.1.1.- Measurement of goods traffic and flow studies	2.1.1.1.- Design of traffic measurement model
		2.1.1.2.- Characterization of goods flows
	2.1.2.- Proposed courses of action	2.1.2.1.- Proposed Courses of Action with regard to Infrastructure, Services and Management
		2.1.2.2.- Proposed Courses of Action with regard to Non-Infrastructure or Services Aspects .
	2.1.3: Plan Implementation and Assessment	2.1.3.1.- Organizational and financial strategy
		2.1.3.2.- Competitive services supply strategy
		2.1.3.3.- Competitive environmental supply strategy

Table 3: Action plans and lines for Operational Objective 2.1

Plan 2.1.1: Measurement of traffic and flow studies. Characterisation of flows.

2.1.1.1. Design of the traffic measurement model

Consists of performing goods flow studies to discover the levels of traffic by land transport and the origin-destination matrices of the goods.

2.1.1.2. Characterisation of goods flows

Plan 2.1.2: Proposed courses of action.

2.1.2.1. Action Proposals for Infrastructures, Services and Management.

- Proposals for coordinating actions on linear infrastructures.
- Proposals for coordinating actions on nodal infrastructures.
- Proposals for Coordinating Transport Services..
- Proposals for the development of Innovation Projects.

2.1.2.2. Action Proposals on non-infrastructures or services.

- Proposals related to procedures and designs..
- Proposals related to the eligibility and generation of projects.
- Proposals for support actions and the promotion of intra-operability in relation to transport authorities, agents and operators.

Plan 2.1.3: Implantation and evaluation of the Plan.

2.1.3.1. Organisational and financial strategy

2.1.3.2. Competitive strategy for the offer of services

One feature of the competitiveness of transport systems is the concentration of services for customers and users.

The Plan must include all the activities and services that are necessary for supporting the activity of all kinds of sectors and shape itself as an integrated services system.

2.1.3.3. Competitive offers strategy of the surrounding environment

This activity will study the competitive strategy of Turkish transport as compared with the surrounding environment:

OPERATIONAL OBJECTIVE 2.2: TURKISH LOGISTICS MASTER PLAN

The globalisation and deregulation of markets over the last few decades have accelerated the transfer of positive and negative impacts to the modus operandi of the business world.

In order to ensure the successful use of a country's logistics potential, the existing physical comparative advantages (geographical location, coastline, lie of the land) need to be transformed into competitive advantages by defining and starting up Master Plans for Action in Logistics.

Logistics plays a fundamental role in the actual environment.

It is an age-old science designed at the dawn of civilisation to foster the development of trade and was, at the outset, already conceived for success through the balanced and holistic integration of the following elements:

- Production maps.
- Transport infrastructures.
- Combined transport corridors.
- Logistics centres networks.

In other words, logistics users combined transport corridors with the appropriate transport infrastructures to connect production centres with consumer centres.

The second is when a territory has important production chains that have not reached their peak owing

ACTION PLANS FOR OPERATIONAL OBJECTIVE 2.2

Turkey's Logistics Master Plan must be an introduction and contain the definition of the key logistics concepts. When an agreement has been reached with all the stakeholders involved in combined transport regarding the definition of these concepts, the working target 2.2 of the Combined Transport Plan of Turkey consists of the following action plans:

- 2.2.1. Analysis of the logistics sector in Turkey.
- 2.2.2. Analysis of the production and logistics chains in Turkey.
- 2.2.3. Definition of logistical locations: centres.
- 2.2.4. Logistics Map of Turkey.

The four plans must be developed sequentially.

OPERATIONAL AIM	PLAN OF ACTION	LINE OF ACTION	ACTIVITY	
2.2. MASTER LOGISTIC PLAN FOR TURKEY	2.2.1: Diagnosis of logistics sector	2.2.1.1. Analysis of the transport infrastructure associated with the logistics sector		
		2.2.1.2. Analysis of the logistics supply	2.2.1.2.1- Real estate and services supply 2.2.1.2.2- Supply trends 2.2.1.2.3- Logistics operators	
	2.2.2: Analysis of production and logistics chains	2.2.2.1.- Study of production sectors		
		2.2.2.2.- Analysis of production chains	2.2.2.2.1.- Description of roles and volume of links 2.2.2.2.2.- Regional production chain	
		2.2.2.3.- Description of logistics chains	2.2.2.3.1.- Description of roles and volume of agents 2.2.2.3.2.- Equipment: cranes, bays, up to special special terminals or logistics areas. 2.2.2.3.3.- Chain flowchart: processes, actors. 2.2.2.3.4.-Socio-economic impact of chain on a region and recommendations.Development.	
	2.2.3: Definition of logistics enclaves and centres	2.2.3.1.- Determination and location of logistics enclaves		
		2.2.3.2.- Strategic design of each enclave	2.2.3.2.1.- Real estate supply 2.2.3.2.2.- Services supply: 2.2.3.2.3.- Functional Design:	
		2.2.3.3.- Analysis of technical, socioeconomic and institutional feasibility.		
	2.2.4: Logistics map of Turkey			

Table 4: Action plans and lines for Operational Objective 2.2

Plan 2.2.1: Analysis of the logistics sector in Turkey

This consists of comprehensively analysing the current situation of the sector to draw up the initial Turkish logistics map and understand the desired situation that is to be reached in the medium and long term via the application of the subsequent plans that correspond to this target.

2.2.1.1. Analysis of the transport infrastructure associated with the logistics sector

Review of all the existing infrastructure types (roads and transport, development centres, clusters, etc.), and the assessment of their level of use and operating conditions for logistics operators.

2.2.1.2. Analysis of the logistics offer

Study of Turkey's active logistics centres according to region, including dry docks, logistics-port activity areas and distribution centres, among others, to determine Turkey's competitive logistics profile as a logistics services supply centre.

2.2.1.2.1 Real estate offer and services

This activity will lead to information about the real estate offer and services in each area (understood as the summary of the services offered by its centres)

2.2.1.2.2. Offer trends

2.2.1.2.3. Logistics operators

This activity pursues to analyse and describe the logistics operators working in Turkey or that have a project for doing so in the short term.

- o Nationality of the operator and type of investment made.

Plan 2.2.2: Analysis of production and logistics chains

Study of the demand for logistics in Turkey to determine the main sectors that need to be attended to regarding the combined transport networks and associated logistics centres and define the type of services to be offered by the different locations to satisfy customers' demand and add value to the product in transit.

2.2.2.1. Study of production sectors

Characterisation of Turkish regions in terms of production so that the analysis includes the relative impact of the logistics services on the development of each region.

2.2.2.2. Analysis of production chains

Identification of the economic activities and industries that make the largest contribution to the national GDP and/or those that represent the greatest strengths, together with those for which their geo-economic location means that they can be developed on the basis of logistics infrastructures.

2.2.2.2.1. Description of roles and volume of links

2.2.2.2.2. Regional production chain

2.2.2.3. Description of logistics chains

2.2.2.3.1. Description of roles and volume of agents

2.2.2.3.2. Equipment: cranes, buildings, special terminals and logistics zones

2.2.2.3.3. Flowchart of the chain: processes, players.

2.2.2.3.4. Socio-economic impact of the chain on a region and recommendations. Evolution.

Plan 2.2.3: Definition of logistics centres and locations

Preparation of the guidelines for constituting comprehensive Logistics Map for Turkey, including the development of different regions and production chains.

Definition of the type of centres that are to be developed at each location to achieve operational success.

2.2.3.1. Determination and location of logistics centres

Definition of "key" logistics centres in the future Logistics map of Turkey.

For each of the centres that are identified, their start-up will be justified, together with their suggested location and distinguishing characteristics.

2.2.3.2. Strategic design of each centre

Key activity for the functional viability of the logistics infrastructures to reach an appropriate definition of their strategy and then position them on the market through the commercial policy appropriate to the demand.

The strategic definition of each location must include the following elements:

2.2.3.2.1. Real estate offer

2.2.3.2.2. Offer of services:

2.2.3.2.3. Functional Design

2.2.3.3. Analysis of technical, socio-economic and institutional feasibility

Plan 2.2.4: Logistics Map of Turkey

This plan constitutes the final result of the effective combination of the previous three, the result of the Logistics Master Plan.

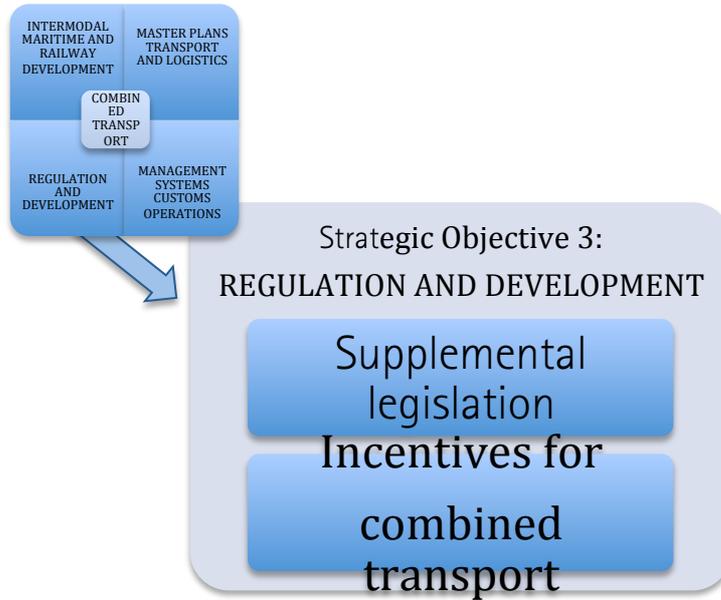
The logistics map involves the integration of transport infrastructures, production and consumption centres, combined transport corridors and logistics centre networks in a national offer of logistics services for national and international operators and producers.

The map must serve as justification for the opportunity detected for various logistics developments proposed in the country, since said developments will be the starting point for turning Turkey's comparative geo-strategic advantages into competitive advantages.

In short, the map will connect the logistics centres of Turkey designed in accordance with the method provided in the Master Plan, by means of combined transport corridors.

STRATEGIC OBJECTIVE 3: REGULATION AND DEVELOPMENT OF TURKISH COMBINED TRANSPORT

The operational actions embodying Strategic Objective 3 for the development of combined transport in Turkey are included in the following figure:



Graph 5: Turkish Combined Transport Strategic Objective 3

STRATEGIC OBJECTIVE 3: REGULATION AND DEVELOPMENT OF COMBINED TRANSPORT

Objective 3 is embodied in two environments:

- Definition of legislative measures supplemental to those regarding the Law on Combined Transport (does not include single window proposals, which comprise part of Strategic Objective 4).
- Definition of measures to develop combined transport.

STRATEGIC OBJECTIVE	PLAN OF ACTION	LINE OF ACTION
REGULATION AND PROMOTION OF COMBINED TRANSPORT	PLAN 3.1: SUPPLEMENTARY LEGISLATION	3.1.1.- Preparation of the Turkish Logistics Sector Law
		3.1.2.-Analysis of the feasibility of a single contract for combined transport
		3.1.3.-Start-up of the Permanent Combined Transport Platform
		3.1.4.- Analyse the feasibility of the application of arbitration cuts to settle issues
	PLAN 3.2: DEFINITION OF PROMOTION MEASURES	3.2.1: Creation of a Technical Commission for the study of Combined Transport incentives
3.2.2.: Fomenting of public-private dialogue.		

Table 5: Action plans and lines for Strategic Objective 3

Definition of supplemental legislation

The legal framework relating to worldwide multimodal transport operations is comprised of a large and heterogeneous set of legal and institutional instruments, for commercial uses and practices and courses of action regarding physical infrastructure whose objectives are:

- To provide flexibility for combined transport operation.
- To ensure free competition among operators.
- To facilitate commercial profitability through infrastructure productivity.
- To achieve economies of scale between production and logistics chains.

The scope of Operational Objective 3 consists of the identification (and subsequent justification) of activities and situations related to combined transport, which would require legal development that favours development through providing coverage for that particular activity,.

Definition of measures to develop combined transport

In this scenario it is necessary to review the impact of the incentive measures implemented for intermodal interchange, as well as to define other actions in accordance with the changing environment.

Measures to incentivise intermodal re-balance

UE measures put in place

➔ *The "Ecobono" (Econo-pass).*

The Ecobono, in order to achieve its objective, subsidises SSS users by reimbursing them for part of the freight.

➔ *Marco Polo II Programme.*

Finance the actions or projects focusing on the desired intermodal re-balance.

➔ *Trans-European Transport Network (TEN-T).*

Finance the actions or projects focusing on the desired intermodal re-balance.

PLAN 3.1: SUPPLEMENTAL LEGISLATION

3.1.1.- Development of Logistic Sector Legislation in Turkey.

- ✦ The law must pursue coverage of sector needs, facilitating operation for logistics operators as well as the creation of clusters in intermodal corridors.
- ✦ The law must establish a clear definition of "logistics and its components" in order to achieve the agreement of institutions and private stakeholders.
- ✦ The law must establish a comprehensive framework to regulate the construction and operation of inland terminals, in accordance with the technical guidelines established in the Logistics Master Plan.

3.1.2.-Feasibility Study for a Single Combined Transport Contract

- ✦ This line supposes a future revision of Turkish commercial law and if necessary, modification to include within the transport chapter information regarding the single combined transport contract, responding to the concerns of the private sector regarding the allocation of responsibilities.
- ✦ This will reduce complaints regarding insecurity and costs of insurance premiums due to confusion with respect to liabilities.

3.1.3.- Commissioning of a Combined Transport Standing Platform

3.1.4.- Feasibility Study for the Application of Arbitration Courts in order to Resolve Combined Transport Problems

PLAN 3.2: DEFINITION OF MEASURES FOR THE DEVELOPMENT OF COMBINED TRANSPORT

This plan is developed along the following action lines:

3.2.1: Creation of a Technical Commission for the Study of Combined Transport Incentives.

The purpose of this committee is to establish an institutional and operational framework for identifying incentives for intermodal re-balance in Turkey.

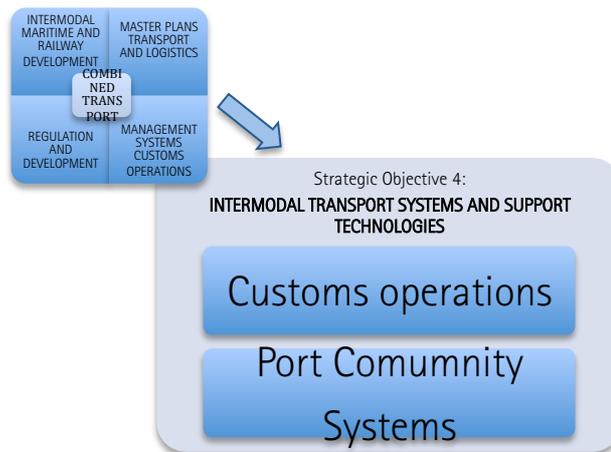
Coordination of this committee is the responsibility of the DG of Combined Transport.

3.2.2: Development of Public-Private Sector Dialogue

Public-Private Partnerships are essential, not only for the construction and maintenance of infrastructure, but also for the management of specialized services and research, by which establishing agreements between different actors is highly relevant.

STRATEGIC OBJECTIVE 4: COMBINED TRANSPORT SYSTEMS AND SUPPORT TECHNOLOGIES

The operational aims covered by strategic objective 4 are indicated in the following diagram:



Graph 6 : Turkish Combined Transport Strategic Objective 4

Technology plays a key role in improving the efficiency of the fore mentioned aspects by facilitating their proper integrated application to achieve combined transport's strategic objectives.

The purpose of applying technological solutions to combined transport is to cover client needs with respect to the reliability, speed, efficiency and quality of the transport operation.

The most contracted solutions internationally are "single window" ones for the trade and transport operations and Port Community Systems to optimise into the combined transport operation.

STRATEGIC OBJECTIVE	PLAN OF ACTION	LINE OF ACTION
COMBINED TRANSPORT BACK-UP SYSTEMS AND TECHNOLOGIES	4.1: CUSTOMS PROCEDURES	4.1.1.- Define a mechanism of institutional cooperation for the definition and implementation of a single window
		4.1.2.- Bilateral Agreements with border countries
	4.2: PORT COMMUNITY SYSTEM	4.2.1.- Development of a Turkish Port Community System
		4.2.2.: Fomenting of public-private dialogue.

Table 6: Action plans and lines for Strategic Objective 4



Trade and Transport operations. Towards the single window

Improvements to the documentary procedures associated with goods' movement, especially in the import-export fields favours and stimulates international trade, the expansion of which in turn gives rise to improvements to procedures, thus generating a "virtuous circle" the main purpose of which is to reduce transport costs.

THE NATIONAL SINGLE WINDOW. WHAT IS A NATIONAL SINGLE WINDOW

The concept of the National SW is to be found within the UNECE's paper 'Recommendation and Guidelines on establishing a SW'. A SW is defined as:

'a facility that allows parties involved in trade and transport to lodge standardised information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements.'

It is Government Service for presenting information and standardized documents through a single point of entry.

INTEGRATION WITH OTHER INSTITUTIONS

Turkish authorities have to decide between a unique single-window or one federated system of single-windows, in order to support an efficient management of combined transport.

Ports are the most important borders of many countries and the main gateways for international freight flows.

To integrate into a single procedure all the formalities required from the consignee of the vessel by the Port Authorities and Harbour Master Office

PORT COMMUNITY SYSTEMS

According to the EPCSA (European Port Community Systems Association) a Port Community System is:

"A neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders in order to improve the competitive position of the sea and air ports' communities; optimises, manages and automates port and logistics efficient processes through a single submission of data and connecting transport and logistics chains".

Through this kind of platforms ports provides logistics agents with a collaborative instrument for them to offer their customers a better service.

PORT COMMUNITY SYSTEMS AS CLEARING CENTRES

In the business processes of port and maritime logistics, the Port Community System are well established, which means that they already have active interfaces with most of the carriers, terminals, local and national authorities.

Today, a significant amount of maritime trade data is communicated via Port Community System.

The Port Community System is able to adapt the set of data into messages that are required by Single Window within a state.

Integration of PCS and National SW as a "Gateway to a 'National Single Window'

The 'Gateway to a National SW' consists of both the community systems (for maritime freight and air freight) and the central government system. In order to support the objectives of a National SW, the Gateway to a SW consists of a purely public section (NSW) and a public-private section (PCS).

PLAN 4.1: TRADE AND TRANSPORT OPERATIONS

The adaptation and harmonisation of the administrative procedures defined and implemented by customs authorities for combined transport is a key factor in developing this transport mode.

Plan 4.1. is proposed to be developed with the following action lines:



4.1.1.- To define an institutional cooperation mechanism to define and implement a single window for Turkey

Turkey needs to decide whether its objective with respect to the single window consists of creating a window exclusively for the sea-port sector, for combined transport, or the idea is to implement the models there that have been successfully established in Europe.

4.1.2.- Bilateral agreements with border countries

The Ministry of Transport has to promote, in collaboration with the Ministries of Customs and Economy, bilateral agreements with border countries to facilitate processes at particular transit points.

PLAN 4.2: PORT COMMUNITY SYSTEM

This plan aim consists of defining Port Community Systems role as Turkey moves towards the Single Window concept.

Most of the Turkish ports and terminals have their own systems to communicate with their clients and users.

Plan 4.2. is proposed to be developed with the following action lines:

4.2.1.- Development of a Turkish Port Community System

The System can adopt a dimension national or local for each port to connect to the National Single Window.

Ports D.G. Transport Ministry will be in charge of the studies necessary to put in place a PCS for Turkish operators.

4.2.2.- Legislative proposals related to Single Window

It's necessary to follow **directive 2010/65/EU** on reporting formalities for ships arriving in and/or departing from ports, for the development and implementation of new regulation on Turkish Single Window.

Strengthening Combined Transport in TURKEY

Component 3:
**Turkish Combined
Transport Strategy**

Strategic Plan

November 2013



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INTRODUCTION

DOCUMENT DESCRIPTION

This document constitutes the final report of component 3 (Turkish Combined Transport Strategy) of the Spain–Turkey Twinning “Strengthening combined transport in Turkey” Project.

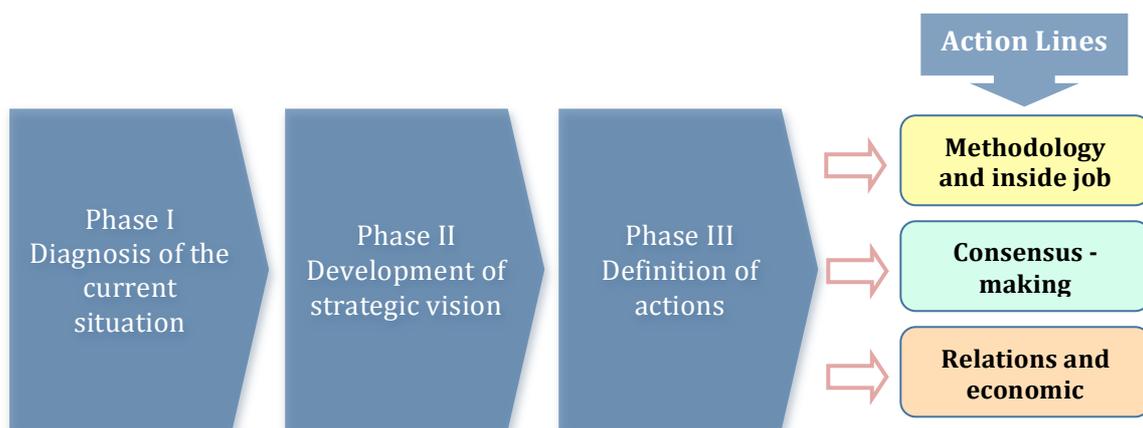
The main objective of this Strategic Plan for the strengthening of combined transport in Turkey is the following:

To establish the guidelines for Turkey to define the operating infrastructure in order to develop an integrated multimodal transport system allowing optimisation of the movement of goods in the national and international markets, and adding new value to the geo-strategic position of the country in world multimodal corridors.

Over the preparation of this Plan there have been additionally achieved the following objectives:

- To develop the long-term strategic vision of the National Multimodal Transport System jointly with the main actors of the public and private sector.
- To define the strategic targets and the required plans of action to be followed for achieving the Strategic Vision, both at general level (National Transport System) and at the level of the different subsystems (Ports, Logistics, Airport, Rail and Road).
- To identify priority infrastructure projects in order to promote Turkish combined transport on a sustained basis.

The design of the Turkish Combined Transport Strategy has been developed over three different phases:



Graph 1: Strategic Plan Activities

This component 3 of the Twinning project has included:

- Two missions to evaluate the state-of-the-art of combined transport sector and to assess the main concerns of the relevant stakeholders (private institutions, sectorial associations and NGOs) related to it;
- Consultation with local experts on the future Turkish Combined Combined Strategy (subcomponent 3.1);



- ▶ A study visit to selected Turkish transport facilities covering the maritime, railway and road modes, as well as the logistic infrastructures where operations of combined transport are taking place;
- ▶ Preparation of this final draft of the Turkish Combined Transport Strategy.

Given the large volume of information already obtained over the implementation of the workshops held with private stakeholders under component 2 of the project, it was decided to use the following methodology for the drafting of the Strategic Plan:

- ▶ The development of a SWOT analysis of the combined transport in Turkey;
- ▶ The revision of the SWOT analysis with the main persons responsible for the different means of transport (roads, combined, rail, sea) and of the essential activities for the development of the intermodality (logistical centres, customs procedures and information support systems);
- ▶ The drafting of a series of conclusions and an inventory of main guidelines that constitute the combined strategy in Turkey, over a series of workshops and interviews with key Turkish stakeholders (public and private);
- ▶ A study visit for the verification of the characteristics of the combined operation developed on different transport facilities along the transport chain in Turkey.

As a result of this working methodology, this Strategic Plan has been structured into the following sections:

- ✦ Revision of the combined transport mission in the present world economic stage.
- ✦ Description of the model of strategic planning for the combined transport.
- ✦ SWOT analysis produced for each one of Turkey's modes of transport with respect to their conversion potential to combined.
- ✦ Account of the points of view of expert agents on SWOT.
- ✦ Strategic Plan for the strengthening of combined transport in Turkey: main aspects.
- ✦ Strategic Plan for the strengthening of combined transport in Turkey: development of proposals.



COMBINED TRANSPORTATION STRATEGIC PLAN IN TURKEY: BASIS

By the year 2023, Turkish exports will reach the figure of \$500 billion. This significant economic dynamism requires that the country develop the entire infrastructure it needs to achieve its goal.

This infrastructure encompasses combined transport, which is to play a fundamental role in this unprecedented economic expansion. Given the large capacity of the transport sector, the country must abandon its overwhelming dependence on road transport, which has a market share in the movement of goods and passengers exceeding 90% of the total.

There is an urgent need to launch combined transport initiatives that ensure a balanced, integrated use of all modes of transport. Internationally the assumption is that a transport system that depends exclusively on road transport is unsustainable in the medium term owing to growing congestion, negative external factors and the impossibility of guaranteeing the levels of safety and efficiency required by the growing volume of traffic.

The purpose of this Strategic Plan for Combined Transport in Turkey is to define and start up an integral transport system balancing the different modes of transport, which requires investment, legislation and improvements to operations in railways, shipping and logistics.

The implementation of new information and communication technologies, the globalisation of the economy and free trade and the lifting of commercial barriers have completely changed the market structure. The situation has evolved since the implementation of protectionist economic policies toward globalised economic processes.

The improvement of the various transport networks and systems has largely made this evolution in the exchange of goods and services possible, which has, in turn, generated a greater need for improving the different modes of transport owing to the greater importance placed on reducing goods transport costs and times to facilitate entry into international markets.

In this sense, because of Turkey's strategic geographical location on the Asia-Africa-Europe communications network, today more than ever goods transport is a basic, strategic sector in economic terms, with a capacity for social and territorial cohesion. It also works as an instrument for economic, social and cultural relations with other countries.

Reality shows that, in the mobility of goods in Turkey (as in the rest of Europe), road transport still predominates due mainly to the country's strategic geographical location on the Asia-Europe communications network and the significant drive of the national economy. Transit, with an economic interest pending study, involves additional costs in terms of the environment, noise, infrastructure, congestion and accidents, among other things.

The European Commission's Communiqué of 29 May 1997 on intermodality and the combined transport of goods in the European Union specified that goods transport was evolving towards an intensification of traffic, causing an increasing imbalance in the use of different modes of transport and a significant increase in transport by road. Consequently, if the aim is to avoid the negative effects of said forecasts in accordance with sustainability criteria, it is considered necessary to opt for a new logistics strategy based on combined goods transport.

But, what is the real meaning of the "intermodality of goods" in the current environment? The United Nations Economic Commission for Europe (2001) defines combined transport as the "*transport of goods in one single load or vehicle that successively uses various modes of transport without the load being handled when the mode of transport is changed*".

Accordingly, in order to create and foster an optimal intermodal logistics model for Turkey, the proposal calls for the preparation of a framework for the strategic development of combined transport in the country with a view to identifying and specifying the initiatives and actions that are necessary to promote the creation and management of an environmentally sustainable combined network that is also economically efficient and socially balanced.

The strategic planning of combined transport in the country is defined as *“the continuous process of adopting decisions in the present with the greatest possible foreknowledge of their future character, to optimise positioning in world logistics chains”*.

The process begins with the establishment of national targets for all the stakeholders involved in combined transport. This is followed by the definition of the strategies and policies that are necessary to achieve the targets that have been previously set and is completed with the development of detailed plans to ensure the effective implementation of the strategies and, consequently, the achievement of national goals.

Strategic planning works as an instrument for coordinating the government's policies and plans with the actions that are to be taken in the Multimodal Transport Sector, defining the steps necessary for checking the three aforesaid processes against the quality and productivity standards demanded by customers.

This gives rise to an combined transport system defined as an organised and flexible network of various modes of efficient goods transport, which reduces the integrated cost of distributing goods to ensure efficiency, reliability and safety in the movement of goods, thus bolstering the competitiveness of products in domestic and foreign trade.

Turkey has made a commitment to intermodality and combined transport as one of the key factors for consolidating economic growth and using the country's geo-strategic location as a world-class logistics platform. In short, to design an combined transport system that meets the above requirements.

Accordingly, Turkey must draw up a comprehensive strategy for the development of combined transport that, verifying the integration of the three key processes, pursues the following national goal:

- ▶ To establish the approaches so that the country has an integrated multimodal transport system that improves access to the national and international markets for products as well as access to public services for individuals, guaranteeing the optimisation of the country's competitive position.

To achieve this goal, the following activities must be developed:

- Identification of the priority projects for infrastructure and operation to strengthen multimodal transport in a sustained manner.
- To build a long-term strategic vision of the national transport system in conjunction with the main players in the public and private sectors.
- To define the strategic targets, action plans and monitoring processes required achieving the strategic vision on both a general scale (domestic transport system) and in terms of the different subsystems (railways, logistics, ports and roads).

In other words, the preparation of the strategy for the development of combined transport begins with an analysis of transport and communications infrastructure as the foundation of any strategic and operative action in the area of transport.



The next step for the generation of the Turkish combined transport strategy consists of drawing up a long-term strategic view of the national transport system in conjunction and collaboration with the main players in the public and private sectors.

This vision is the desired scenario to be achieved in the long term for the Turkish combined transport system.

The last step for defining the master strokes of the strategy for the development of combined transport in Turkey will consist of defining the strategic objectives and action and monitoring plans required to achieve the strategic vision, both on a general scale (domestic transport system) and in terms of the different subsystems (railways, logistics, ports and roads).

COMBINED TRANSPORT

1.- CONCEPT, SCOPE AND SPECIFIC FEATURES

Globalisation requires all economies that pursue sustainable development to have competitive transport systems. Transport represents the balance between being or not being in the ultra-competitive game of global businesses.

Transport is the link between the world productive plant, distribution and the centres of consumption. It's a challenge and a brilliant opportunity for Turkey to participate decisively in the international dynamic, reflecting the value of its privileged geo-strategic position.

Faced with narrowing manufacturing margins imposed by the unstoppable, cheaper and generally lower quality Asian production, the great potential for reducing costs for the majority of global companies can be found in the implementation of logistics systems.

Transport is the base upon which logistics is structured. The profitability of said activity is directly proportional to the efficiency with which the different modes of transport are effectively linked between each other (sea, air, rail and road) with infrastructures for the shipping, connectivity and reception of goods in order to provide service to the production, distribution and centres of consumption. This infrastructure and its operating and service systems are known as combined transport.

The multi-modal transport system plays an important role in the world economy (a role whose significance will grow as a consequence of advances in technology and increasing environmental restrictions), since it contributes towards optimising the transport logistics combined with the advantages of different modes of transport in the segments in which each one of them is more efficient.

In this context, all countries are forming policies and creating incentives for the development of multimodal transport, given its condition as a multiplier for international trade. That said, the changing environment not only demands the design of policies: strategies must be drawn up which, built on a strong legal body and materialised into regulatory laws of intermodality, allow specific objectives to be set for their implementation and monitoring.

These strategies, established in action plans with their respective indicators, have to configure a driving force behind a framework of action for combined transport by promoting its benefits and overcoming existing barriers.

The multi-modal transport system is currently based, fundamentally, in the movement of containers derived from the activities of foreign trade.

This form of transport, technologically supported in combined movements with door-to-door services, emerges from a commercial and legal point of view through a single contract to one multimodal transport operator, a contract that gives full responsibility to the whole process.

Herein lies one of the main characteristics of combined transport versus unimodal or segmented, which require several contracts in order to carry out door-to-door movement of goods.

In terms of their technological and operational characteristics, multimodal, combined or combined transport is focused on the use of two or more modes of transport for transfer of the same load from the origin to a destination, which is carried out for economic reasons or because the physical-geographic conditions demand it.

Multimodal transport is organised by a multimodal transport operator (MTO) from the seller's door to the purchaser's door under a single contract called the multimodal transport document (MTD).

The operation of the multimodal chain requires the existence and development of a suitable infrastructure and technology on which the material flow of this chain is grounded: port facilities, land centres, container handling facilities, specialised transport methods, etc.

Multimodal transport is intended for final door-to-door delivery from the producer to the consumer, with minimum overall transport costs of general cargo and reduction of overall journey and delivery times.

This minimisation of costs and deadlines is achieved in combined transport due to:

- increase of operational productivity through the use of efficient equipment during transshipment loading and unloading operations,
- storage in specialised installations during the exchanges,
- reduction of labour force employed in low value added activities due to the adoption of document simplification measures and the adoption of a single combined transport document,
- the use of lighter and cheaper shipments,
- less possibility for the commission of illegal acts,
- reduction of losses with the consequent declines in insurance premiums.

Intermodality implies that all involved transport modes act as a single chain, in such a way that physical connection aspects and control processes for cargo could be at the same time, integrating three processes:

- ▮ Physical process: exemplifies the real capacity of connecting a mode to other easily.
- ▮ Information process: implies the capacity of data transmission from one mode to other, to cargo terminals and participating actors in cargo control process (shippers, intermediaries, service suppliers, etc.)
- ▮ Documental process: Capacity of acting as Customs, Sanitary, Security, Civil Responsibility systems of cargo. Manoeuvres.

Intermodality means the mobilisation of general cargo from the origin (producer) to the destination (final consignee), with the successive use of more than one mode of transport. The goods are not handled directly in the different transfers or segments of this transport, which has established the container as the most useful instrument in the intermodal chains.

Multimodal goods transportation needs institutional backing to give it impetus, which can characterise it and provide it with the essential facilities for direct ("through") transport on the various segments and terminals. This support has materialised in different nations in the "*single transport document*", required for the movement of each shipping unit and constitutes evidence of the Single Transport Contract.

This contract represents the responsibility assumed by a single multimodal transport operator (MTO) to the owner of the goods and includes payment for the single freight, single insurance, customs clearance, fees and other expenses included in "door-to-door", "overall" or "total" transportation.

Multimodal transport, in spite of benefiting from the many virtues of direct, origin-destination connection, must be considered as strong as the weakest systems of which it is comprised.

Hence the need to strategically structure the different modes of transport, ensure good physical integration between them using specialised terminals (for containers when that is the unit of freight), as well as the support of a good institutional base.

The multimodal transport of goods, consequently, consists of the use of two or more transport systems on its various segments, with the issue of a single transport document by the combined transport operator, valid for the whole journey from door to door, which does not prevent or exclude the right of the transporter of each modality to also issue their own Bill of lading (road, rail, B/L, AE/B), corresponding to the section made on the entire route.

2.- WORLDWIDE CHALLENGES FOR THE DEVELOPMENT OF COMBINED TRANSPORT

Experts and administrations agree that the main advantage of combined transport lies in the combination of advantages inherent in the different modes involved. In any case, not just roads, although they account for 85% of movements within the country.

Of all the benefits generated by the resource to combined transport, that of cost reduction stands out above the rest, an aspect which focuses on two areas:

- X** reduction of **social costs**: road safety, air pollution, acoustic contamination, energy and raw materials consumption...
- X** reduction of **infrastructure costs**: reduction of road traffic, with consequent decreases in congestion and better use of the actual capabilities of the transport systems.

Intermodality generates other benefits, such as the transport of large volumes of goods over long distances, also carrying out sea or rail transport during weekends, holidays and overnight.

However, in order to convert combined transport into a real alternative to unimodal transport (basically, by road), the friction costs must be identified, quantified and reduced on changing the mode. This involves cost overruns which constitute a measure of inefficiency during combined transport operations, translating into higher prices, more delays and less reliable deadlines, reduced availability of quality services, restrictions on the type of goods, more risk of damage and more complex administrative procedures...

The momentum of the intermodality constitutes a basic instrument for achieving a better position of transport in general.

This requires a reallocation of resources in companies of the sector, the purpose of which would become the transport chain, with the collection and delivery steps going to the lorry.

This strategic reorientation of the current unimodal transport operators (by road, generally) would be, in turn, a major contribution to the development of intermodality, as well as to improvements in the operational efficiency of the sea and rail modes.

At the same time, the actors involved in the transport chain must be capable of providing added value to the chain itself in order to assist in eliminating friction cost.

This process includes services such as storage, information management, etc.

The following table presents a summary of the main barriers and opportunities/actions for intermodal transport to be competitive.

Obstacles and opportunities of combined transport	
Obstacles	Actions
Legislative	Overcoming administrative barriers
Provision of infrastructures	Creation of an combined network
Economic	Reduction of friction costs
Commercial	Promotion of combined transport
Technical/Operational	Implementation of new technology

Figure 1: Combined Transport development

In order to learn more about the development of combined transport, it is essential to find out which actors are involved in the process, both at a logistical level and in transport operations.

On an international level, 23 market segments have been detected with broad future development for combined transport, which have been characterised by combining factors such as resources, types of user, distance of transport, type of goods.

Additionally, the power of decision making of the parties involved in the transport chain must be taken into consideration:

Power of decision of the different actors in the combined transport chain	
Levels of influence	Actors
Ability to decide throughout the chain	Loader/Charterer (or recipient). Shipping
Ability to decide on all or part of the chain	Freight forwarding Long distance carrier
Ability to decide in part on the chain	Logistics services provider Combined operator (door to door)
No participation when decision making	Combined operator (terminal to terminal) Ferries operator. Terminals operator. Short distance carrier

Figure 2: Combined transport chain actors and its power of decision

3.-CRITERIA FOR MODAL CHOICE

The key to strategic development of combined transport lies in offering a comprehensive response to the needs of operators and loaders who apply the following criteria at the time of making your modal selection.

These stakeholders apply the following decision-making criteria:

3.1.- MARKET CRITERIA

These criteria are threefold:

► Loader:

- The size of the company determines the modal selection, and sets the volume, frequency and regularity of the shipment, as well as the level of subcontracting and ownership of the transport fleet. It is wrong to think that large-sized companies are those, which are more inclined towards combined transport.
- The geographical location of the decision-maker determines the distance of the company to its raw materials and other production processes. If the production centres are near to the resources or the markets, it becomes extremely difficult to rely on combined transport due to the increased costs generated by overland hauling between terminals.
- The distance between terminals concerns the distance between the client and loader and has a bearing on the cost of the transport chain.
- The perception of combined transport as clean may make companies choose it in order to project a good image to the public.

► Type of transport:

- The volumes and frequencies of the shipments, factors closely linked to the size of the decision-maker (the larger the loader, the higher the volumes of transport and frequency of shipments).
- Compensation of loads (that the flows are organised so that return of loaded vehicles is guaranteed) favours intermodality.
- The structure of the load (number of collections and deliveries to be made throughout the route). The fact that goods must be collected or delivered at different points means that the loader has to examine the possibility of organising an efficient distribution system for the different origins/destinations, which hinders the development of combined transport.
- The type of goods sets out requirements for their transport: raw materials, bulks, parcelled goods, packaged in light vans, high value-added products, perishable products requiring transport in refrigerated units and hazardous substances requiring additional safety measures.
- Requirements of the combined loading unit: As well as combined transport being appropriate for the type of goods, the capacity of the latter must be taken into account in order to take optimal advantage of the usual combined loading units (swap bodies, containers, semi-trailers).

One example is the palletized load, more suitable for transport in swap bodies than in containers.

► Economic environment of the decision-maker:

- The stability or uncertainty of the economy and the institutional environment.
- The organisation of the company and economic specialisation of the region/nation: the overwhelming presence of small and medium companies in some transport chains can hinder the development of combined transport.
- If there are expectations of change in the form of operating transport processes in terms of time, distance, volume etc., these may influence the decision to use combined transport or not.

3.2.- COST AND QUALITY CRITERIA

Cost may be defined as the price paid by the loader to the operator for the transport, transshipments required and other logistical services requested.

The decision-makers shall compare the cost of transport and therefore assess the cost differential between the transport chain by road and an combined chain (in terms of origin and destination).

However, apart from the market criteria, the decision to use combined transport depends in large measure on the logistical services provided by the operator of the road transport chain or by that of the combined transport chain. However, the characteristics of the different services have a decisive bearing on the decision-maker.

The cost and quality criteria are usually assessed jointly but certain quality requirements have a bearing on the cost of the transport chain. Some indicators show that those decision-makers who do not consider cost as the most relevant factor perceive better quality in transport and this translates into lower costs. This fact underlines the decision-maker's power in imposing certain requirements.

The following is usually taken into account with regard to quality criteria:

- Reliability (probability that the shipment is delayed and the frequency of these delays).
- Flexibility (time period between ordering and the time in which the goods are loaded, with the minimum time possible for shipping).
- Safety (probability of damage to the goods and the frequency of the damage).
- Door to door transit time (time needed to transport the goods from the origin/loader to the destination). This is one of the most important criteria in choosing a mode, above all for certain types of goods (perishable goods, car spare parts, etc.).
- Quality criteria relating to the processes carried out at the terminals: loading and unloading time, goods preparation time, waiting time between operations, efficiency of the shipment operation, monitoring and traceability of the goods ("tracking and tracing") and additional logistical services.

3.3.- CONCLUSIONS

To summarise, in the following graphic we can see the main criteria affecting the modal choice by the decision-maker, customised for combined transport.

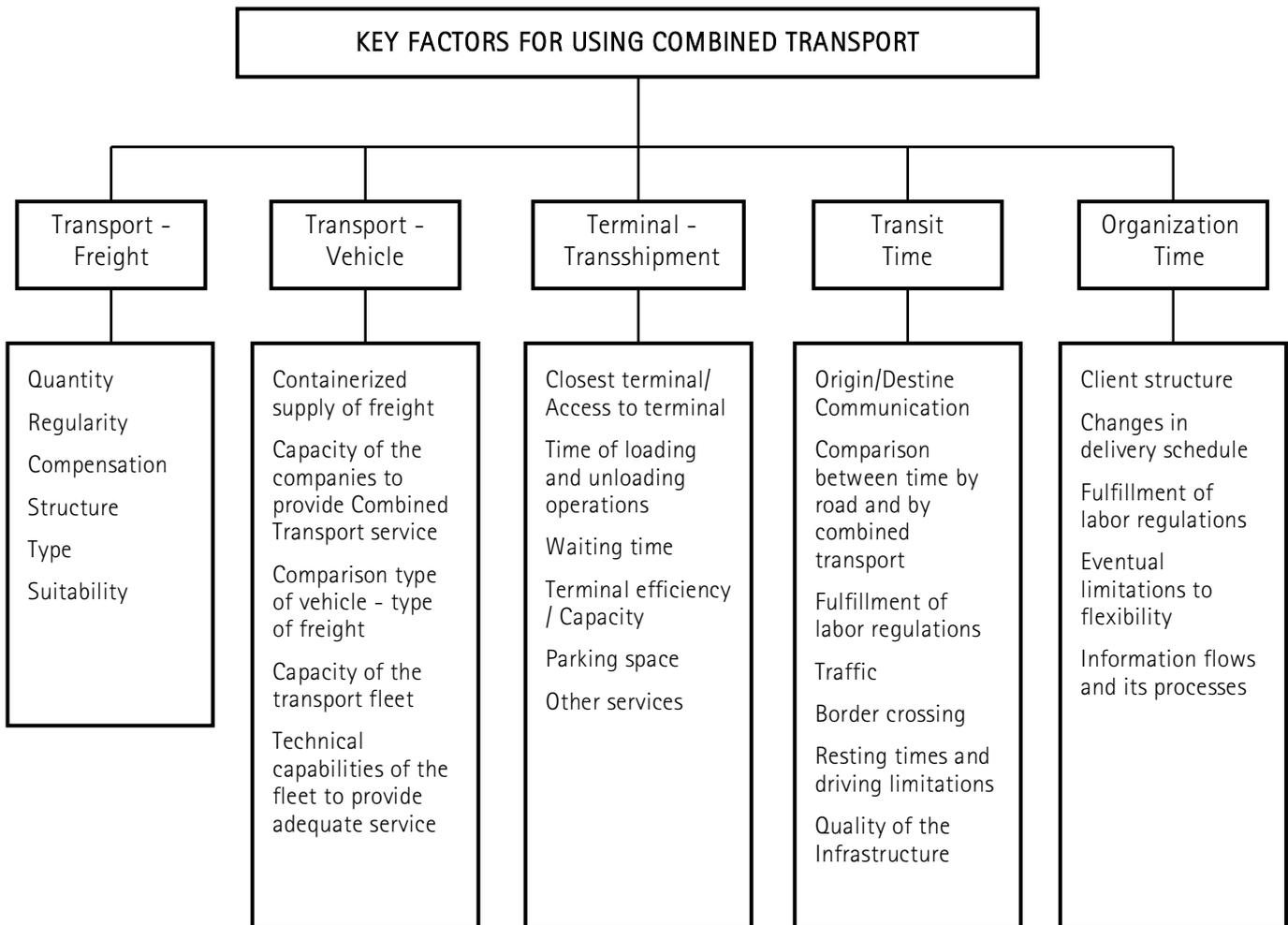


Figure 3: Factors focusing Combined transport

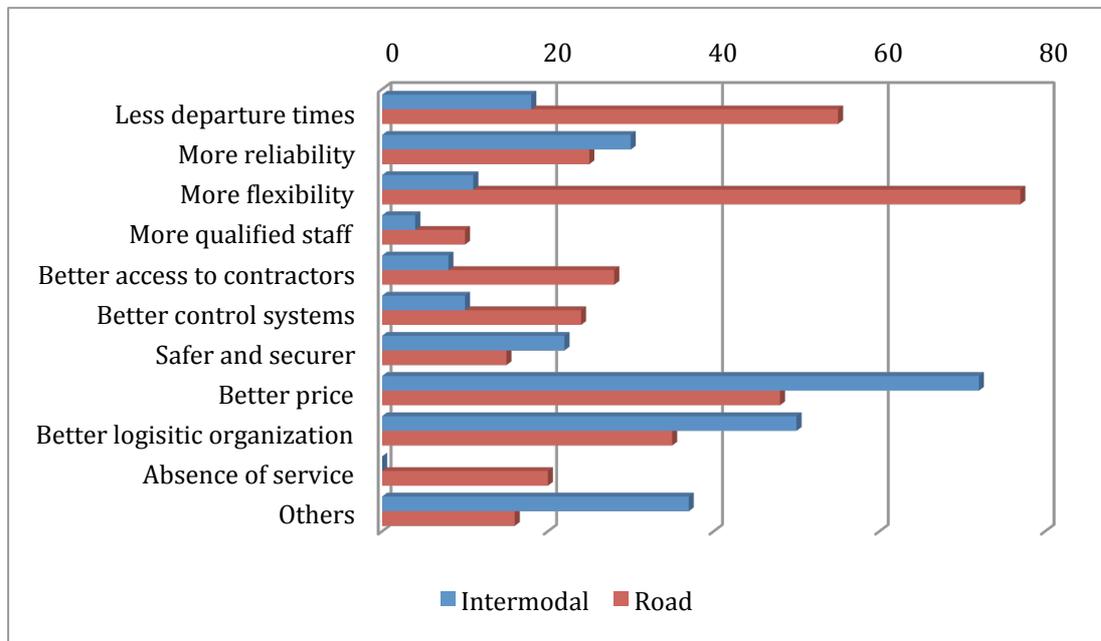
From analysis of these factors we can come to the following general conclusions:

- The regularity of the shipments is a prerequisite for the use of combined transport.
- The cost is the essential criterion for choosing the transport mode.
- Reliability is the most important quality criterion.
- The frequency of the service offered and the services provided are the most important criteria for suppliers.
- The flexibility is the least important of the quality criteria.
- We can see a small difference in the importance of the cost factor between the different actors.

For shippers, cost is much more important than quality criteria, while for loaders cost is the number one factor, although in the latter case reliability also has great importance.

Freight forwarders/carriers, in the majority of cases, give equal importance to cost and reliability.

These conclusions can be compared with those of the attached table which gives an analysis of the combined transport market with regard to road transport carried out in Europe in 2012 during the execution of Project Artemis using research methods with the main mono- and combined transport operators:



Graph 2: Comparison combined transport versus road

Analysis of the previous table concludes that:

- Cost is the most relevant factor at the time of making a modal choice.
- Companies choose the transport most suitable to their logistics structure.
- Combined transport is considered less flexible and is not chosen by companies requiring short transit times.

To conclude, any strategy in Turkey for developing combined transport will have to materialise in two areas:

- Design of a network of infrastructures that maximises the generation of savings in transport and storage costs through intermodality resource.
- Integration of transport chains and logistics with production chains, ensuring integration of existing ones and producers with the needs of customers within a framework of mutual collaboration and cooperation.

COMBINED TRANSPORT STRATEGIC PLAN

CONCEPTS

The preparation of this Strategic Plan for combined transport in Turkey has been developed in accordance with the following stages:

- reflection on the objectives and future possibilities of said transport modality;
- analysis of the opportunities and threats in the international competitive environment to the development of combined transport in Turkey;
- identification of the internal strengths and weaknesses existing in Turkey launching said form of transport effectively;
- evaluation of the competitive position of combined transport in Turkey on the international stage; and
- definition of the desired future configuration of combined transport in Turkey and the most suitable lines of action for achieving the strategic targets that set.

The methodology used is shown in the following diagram:



Graph 3: Methodology for Turkish Combined Transport Strategic Plan

The plan for the development of combined transport in Turkey is strategic, not operational.

A strategic plan consists of analysing the scenario, sector trends and definition of the vision (what is desired in the future) to then define the strategy: what has to be done to achieve this vision and the rest of the strategic development until the action plan is achieved.

An operational plan requires the continuous analysis of the evolution of demand, the forecast of its evolution across a period of time and, depending on said forecasts, the definition of the requirements for satisfying these needs.

The process for drawing up the strategic plan for combined transport in Turkey has applied a holistic focus based on the following fundamental concepts.

The first phase consists of preparing the **strategic diagnosis** as follows:

1. analysis of the international environment for combined transport in Turkey, paying particular attention to two critical factors in the development of combined transport: shipping and logistics, as regards logistics centres and corridors.
2. study of the domestic environment in Turkey, reviewing the intrinsic features of combined transport in the country regarding the importance of the geo-strategic position, the integration of production chains and logistics chains and, basically, the markets served.
3. as a consequence of the foregoing activities, definition of the **competitive position** of transport on the international stage.
4. preparation of a SWOT matrix (Strengths, Weaknesses, Opportunities and Threats) for combined transport in Turkey.

The second phase, **preparation of the strategy**, consists of defining the mission, vision and values of combined transport in Turkey. The strategy is not prepared generically but rather tailored to the macroeconomic scenarios that condition, determine and mark out the development of the Turkish economy. It is essential to establish these concepts to guarantee that the Turkish Combined Transport System has its own differential system and operations.

This phase is developed in accordance with the following concepts:

- **Mission:** *raison d'être* of this transport modality, in short, why the country needs to develop it. The mission explains the economic and social purpose of transport and is the result of analysing the environment and strategy.
- **Vision:** future of combined transport in Turkey, strategic targets and desired positioning. The vision defines the direction this form of transport is to take and what the country wants to achieve in the period during which the Strategic Plan is in force.
- **Values:** foundation for combined transport in Turkey. Values are of key importance for this mode of transport and stand as the key reference for its operation on an international scale.

The third phase, strategic planning, consists of defining the critical factors for the success of combined transport in Turkey. These factors, identified in the corresponding SWOT analysis, are the key issues to be dealt with by Turkey if it is to fulfil its mission and achieve its operational targets.

The analysis of these factors leads to strategic alternatives that will define the future development of combined transport.

These success factors are determined using future scenarios and such scenarios are generated to facilitate strategic decisions regarding the development of combined transport, detecting and exploring the various mid-term and long-term alternatives and estimating the potential consequences of the different actions that are planned.

The scenarios are socio-economic configurations on a world scale that determine the evolution of combined transport.

In the preparation of the Strategic Plan for Combined Transport in Turkey, two scenarios have been defined:

- growth and
- competitive positioning of this form of transport.

The scenarios provide an estimated vision of the future that may be used as the basis for development plans, such as the Master Plan for Logistics Corridors, which contains detailed traffic forecasts for each of the corridors that are defined.

The scenarios generated include a reference estimate of the following issues:

- Infrastructure required
- Economic impact
- Potential players involved in implementing the scenario

The fourth phase consists of drawing up the **strategic map** of combined transport in Turkey, which establishes the strategic targets in a matrix of strategic lines and outlooks.

The fifth phase of the preparation of the strategic plan for combined transport in Turkey consists of defining the **operational targets** for their development: the interaction between strategic targets and SWOT factors generates the aforementioned **operational targets or lines of action**, with which the aim is to "leverage" the strengths and opportunities of combined transport and "correct" its weaknesses and threats.

Accordingly, by associating the operational targets with the strategic targets, a clear view is obtained of the actions to be taken to achieve each of the strategic targets.

The operational targets are grouped together under **action areas**, which comprise all the areas of combined transport in Turkey.

The sixth and final stage consists of drawing up the **Action Plans**, which unify the actions identified and selected throughout the development of this Strategic Plan, which result from an in-depth analysis of the current combined transport situation in Turkey, done beforehand in the Diagnosis and, in particular, the **SWOT**.

This analysis is complemented with the definition of key elements, such as the Mission, Vision and Values of the Transport Port, the determination of the established Strategic Targets and each of the Operational Targets proposed, grouped together under action areas and associated with each of the strategic lines defined.

These actions are aimed to resolve the weaknesses, establishing or designing actions that respond to threats, improving the strengths of combined transport and taking maximum advantage of the opportunities detected.

Therefore, methodologically speaking, after the analysis stage and the consideration of the strategy, the initiatives that will make it possible to achieve the **Operational Targets proposed** are specified.

This is the Strategic Plan sequence, the scope of which is outlined on the following pages ending with the initiatives included in the Action Plans.

The Strategic Plan cannot be considered a static document: the results must be **continuously monitored**, in turn generating a process for learning and continuous improvement allowing the agreement to be reformulated in accordance with any changes that occur and the results obtained.

DEVELOPMENT OF THE STRATEGIC PLAN FOR COMBINED TRANSPORT IN TURKEY

The following shows the development of the six phases of the Strategic Plan for the Development of Combined Transport in Turkey.

1.- STRATEGIC DIAGNOSIS

This comprises the following elements:

- Environment analysis
- Internal analysis
- Preparation of the SWOT matrix

1.1.- ENVIRONMENT ANALYSIS

In the strategic diagnosis of the plan for the combined transport in Turkey there have been identified two main issues regarding the external aspects affecting the sector:

- First of all, the Turkish position in the global ranking regarding competitiveness and development of transport and communications infrastructures
- On the second hand, the current situation of the international maritime transport and global trends regarding logistics, two issues crucial for the future development of combined transport.

The analysis of maritime transport and logistic sector in the world, are two key issues to consider in order to build a proposal for the starting up of national policy of sustainable combined transport networks.

Global competitiveness of Turkey.

According to the World Economic Forum (WEF) ranking, Turkey is in 43rd place in terms of the development of infrastructures (transport and communications):

40		Panamá	4,5
41		Polonia	4,5
42		Italia	4,5
43		Turquía	4,5
44		Barbados	4,4
45		Lituania	4,4
46		Azerbaiyán	4,4
47		Malta	4,4
48		Brasil	4,4
49		Portugal	4,4
50		Indonesia	4,4

Figure 4: Global competitiveness ranking

The WEF infrastructure index evaluates various issues, in which transport plays a leading role (70% of the value of the measurement). The factors that are evaluated are as follows:

- Road quality
- Railway infrastructure quality
- Port infrastructure quality
- Air transport infrastructure quality
- Quality of the power grid
- Quality of the telecommunications network

The WEF ranking stands as a starting point for regularly evaluating developments in infrastructure by each nation. It must be also be used to programme the roadmap for the development of national and international transport: without adequate infrastructure, the development of foreign trade is not possible, and foreign trade is the key to economic and social growth.

In view of the results shown in the ranking, Turkey has adequate positioning on the international stage and the condition of its infrastructure is ideal for progressing along the path of combined strategic planning.

Maritime Transport in the development of the combined transport sector

For the development of combined transport is required the integration of a complex number of issues interconnected. Among those, the international maritime trade and the logistic services play a key role in fostering foreign trade.

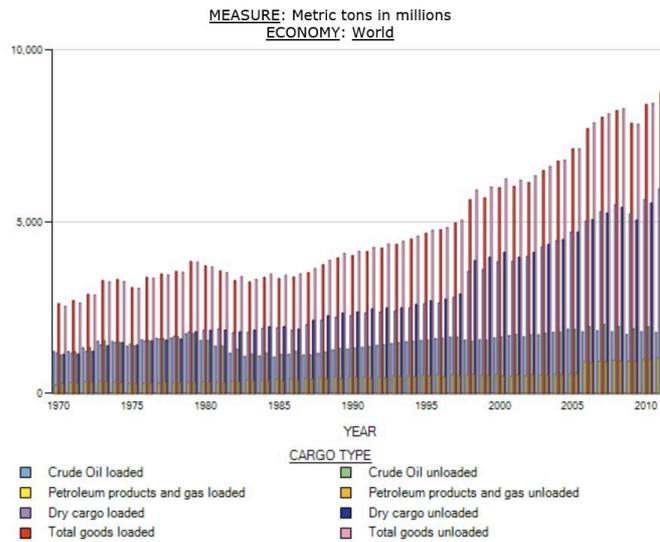
Current Situation

Traditionally monetary information on shipping trade is calculated on miles/ton basis, quite different from monetary-based statistics for the value of world economy.

Besides the constant growing of the international maritime transport, both in terms of fleet, that is to say, number of ships and cargoes, calculated the later on tons per mile basis, was duly analysed taking into account a period of time from the beginning of the seventies till the present which gives an idea about the very dynamic attitude of the sector.

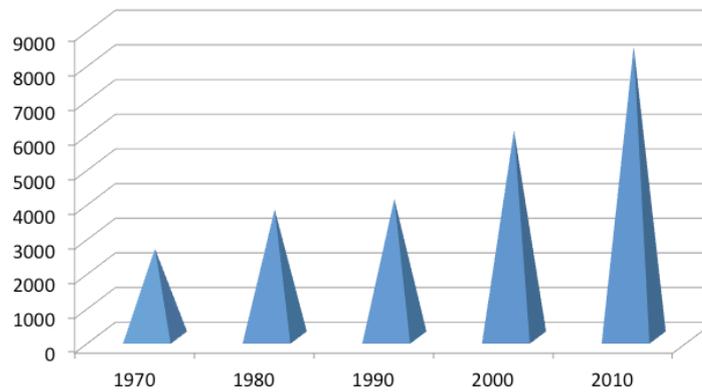
In actual fact and in accordance with UNCTAD data freights rate represents a 5% of the total trade.

Due to its efficiency the sea transport cost for the customer is quite competitive.

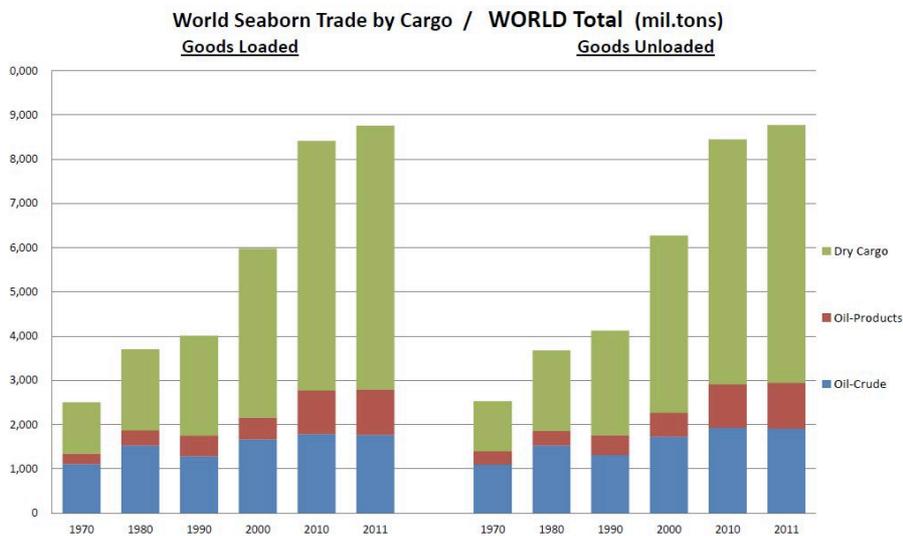


Graphic 4: Growth of maritime trade by type of freight

The growth of world's maritime traffic has been a constant that is reflected in the next graphic:

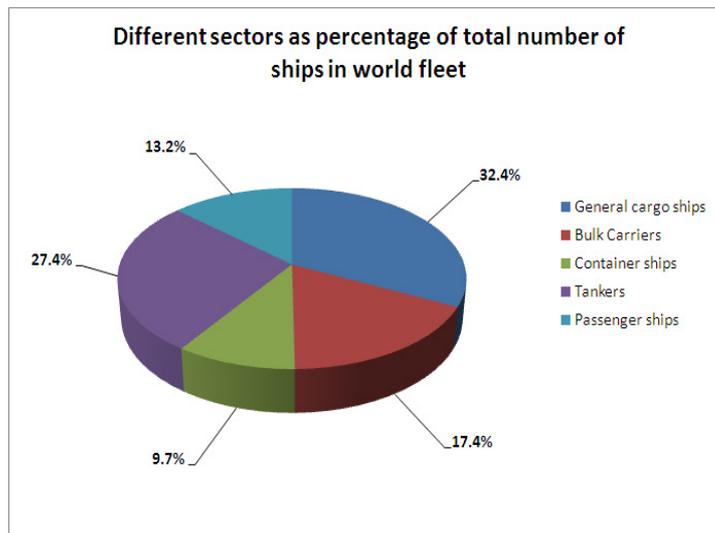


Graphic 5: Growth of world maritime trade (in million tons)



Graph 6: World Seaborn Trade by Cargo

World's fleet is spreaded according to the following ships typology:



Graphic 7: Distribution of world fleet

Nevertheless in recent years and as consequence of the unpredictable increase of fuels costs together with the economic uncertainty led to a reduction of the ship' companies profits and then the interest for the use of new strategies and technologies to reduce fuel consumption is well established in the shipping sector both from the public and private point of views.

In any case and also due to the present and global economic crisis the constant growing of the fleet of the previous decades seems to decrease even to stop for some sectors.

On the other hand a very brief reference to the traffic distribution was developed first at global scale then for the Mediterranean area, the later due to the geographical position of Turkey.

The worldwide forecast is that port demands will double every ten years.

That does not mean that every port must double its infrastructure over the same period since not all ports will increase traffic volumes by the same percentage and **management must increase the productivity** of existing infrastructure.

Challenges and trends regarding shippers, logistics operators, shipping lines and port operators are the following:

- **Shippers** want more control of the global logistics chain and will increase their decision-making power in this matter.
- **Logistics operators** have to offer comprehensive added value services to increase their size and scope mainly via **horizontal integration** and to invest in **information technologies** to manage information across the supply chain.
- **Shipping lines** are responding with vertical integration throughout the logistics chain and through horizontal integration via alliances, mergers and acquisitions (M&A).
- **Port Operators** have to face the challenge of **increasing productivity** in port terminals and **reducing costs**. Especially in Europe, where in relation to Asian ports, they have a lot of opportunities for improvement. They are also facing a trend of concentration among major global port operators.

In addition, Shipping companies are building bigger and bigger vessels to obtain a reduction in operating costs and this strategy is resulting in a reconfiguration of navigation networks.

Concerning the regulatory framework, the processes of liberalization and privatization are a consequence of the promotion of the free market in most countries in the world.

In relation to privatization, there are two different models:

- ✓ privatization of ports,
- ✓ privatization of port services.

With privatization an increase in efficiency would be expected since the private sector is more efficient at managing services than the public sector.

However, to guarantee full efficiency and avoid possible scenarios of monopolies, one has to analyse whether there are appropriate market conditions (competition) inside the port or between different ports in a region.

In any case, it is generally accepted that it is extremely important to regulate the conditions of service in concession contracts.

Sector future trends

Trends in traffic, logistics operators, shipping lines and port operators are opportunities for ports to gain new traffic volumes.

However, in order to take advantage of these opportunities, ports should encourage differentiation in the key aspects of port competitiveness in comparison to their main competitors:

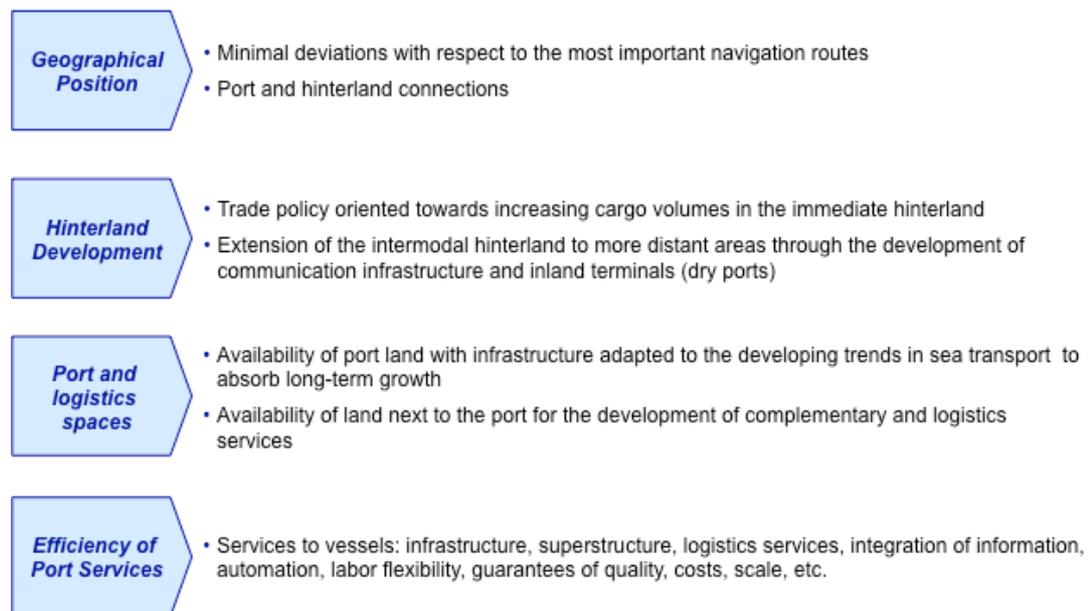


Figure 5: Key factors for the development of port activity

In this context, ports must reduce costs and the time required for operations, offer reliability and guarantee service quality as well as assure transparency in these port services.

In order to face the requirements of port competitiveness, the most advanced ports are working on projects of Global Quality in port services, on new technologies such as port community systems, on Sea-Land interconnection and on the development of a Hinterland strategy.

The concept of a **Port Community** is the result of analysing the perception of the end users of the port (shippers and shipping lines). They regard the port as a 'black box' and they have a global perception of port services. They perceive that the port is efficient, cheap or secure or just the opposite: inefficient, expensive or insecure and they do not know, nor do they need to know, who the inefficient agent of the port is.

So, if the service level perceived by the customer is the result of the joint efforts of the port community as a whole, then the objective is to work as a '**virtual company**'. With this objective, some ports in the world have created systems to guarantee the global quality of port services through a port quality seal.

Concerning Land-Sea interconnection, most ports and terminals focus on **vessel productivity** and port resources have been designed to optimize this productivity while other services, especially **sea-land interconnection**, are usually ignored.

Nevertheless, this interconnection is becoming more and more important. In fact, in many big ports serious **problems of congestion** can be found in road accesses.

The importance of a **Hinterland strategy** and concluded that the lifeblood of a port is its Hinterland, since the potential business in a port is by far the most important factor to be considered by shipping lines seeking to work with this port. So, a clever hinterland strategy that refers to the hinterland as a network interconnected to the port is crucial. In fact, the real competition is not between ports, but between logistics chains running through ports. So, in order to be efficient, **competitiveness must be introduced in the whole logistics chain**.

Analysis of global trends towards logistics sector: New concepts, ideas and logistics clusters.

As mentioned earlier combined transport requires the existence of network of efficient and competitive logistic centres integrated within the transport corridors. Without these network combined transport faces serious difficulties for its development and consolidation.

Therefore in order to build and efficient combined transport system it is required to review the global trends in the logistic sector.

LOGISTICS: THE COMPLEXITY OF DEMAND

The European Union Communication from the Commission contains the following points on Logistics:

- **Freight transport is a derived demand.**
 - It is therefore part of the economic process.
 - The requirements of industrial processes have changed drastically during the past 10 years and can be characterized by global competition, shorter production processes and product-life-cycles and the need to cut costs.
 - The use of just-in-time delivery, customized production and the concentration of supply- and distribution centres have led to a close interrelationship of production and distribution processes and transport, aimed at high service performance, reduced time-to-market and lower costs. At the same time, competition in global markets has

increased the number of players and the geographic scope of the supply-and distribution chains.

- Efficient logistics have become a crucial factor of competitiveness.
 - *“Logistics can be defined as managing the flow and storage of raw materials, work-in process, finished goods and the associated information from the point of origin to point of final consumption in accordance with customer requirements. In a wider sense it also includes the recovery and disposal of waste”.*
- Transport plays a major role in the logistics and service quality of the overall supply and distribution chain.
 - Freight transport has to meet increasing quality requirements in terms of flexibility, speed and reliability in order to deliver the goods at a precise time and place.
 - This includes the movement of goods as well as storage/warehousing functions, packaging or customization.
 - Depending on the type of good, logistics costs can account for up to one third of the final market price, although this proportion is often smaller and has generally decreased over the last decades. About one quarter of these can be transport-related costs.

Taking into account the complex interaction of sourcing, suppliers, manufacturers, retailers and consumers, combined transport will allow the integration of a broad range of transport services in the supply- and distribution chains.

Well-functioning information and communication flows are indispensable for the management of multiparty supply and distribution chains. They allow pre- and on-trip information exchange, including service availability, negotiation procedures, tracking and tracing, information on disruptions and the flow of transport documents.

Advanced services such as real-time information accelerate the information flow and make it more reliable that enhances service quality.

As a result of business strategies that concentrate on core-competences, third party logistics services are a growth market.

Specialized logistics service providers stem from production management, warehousing or transport operations. They are entering the market in greater numbers. Their function is to offer sector and customer-tailored solutions for integrating intra-company flows of material and goods with inter-company transport procedures.

Increasingly, they will play a major role in defining transport demand requirements on behalf of their industrial clients, and explore how transportation can add value to the overall logistics chain.

Global supply chains, international corporations, multinational integrated production consortia have in spirit of competition and growth become highly sophisticated and complex systems.

From the logistics perspective, a strong internal driver is present, which forces them to integrate their business functions within the entire supply chain to facilitate integrated flows of goods and services.

A supply chain consists of multiple business partners who work together directly or indirectly which are collaborated by information, material and financial flows.

These flows may lead to high complexity due to the lack of information within supply chain participants.

EU ACTIONS TO ENHANCE THE EFFICIENT TRANSPORT CHAIN INCLUDING LOGISTICS

In 1997 the Commission published a communication on intermodality, which underscored the importance of it for making European freight transport more efficient and environmentally friendly.

The text put forward a number of strategies to promote "*sustainable mobility*", including the modernization of logistics systems. It also announced that the PACT program would be replaced by Marco Polo. In 2001, the mid-term review of the White Paper COM(2006) 314.

Logistics connect the virtual world of the Internet with the physical world of goods.

One of the key challenges in logistics is the **synchronization** of movement of freight and goods with the flow of digital information. Electronic shopping, individual mobility and manufacturing are heavily dependent on logistics. The systems and networks are getting more and more complex every day.

The European Union's contribution is summarized in:

- An Action Plan on freight logistics.
- Several initiatives in the field of maritime transport, in particular a Communication on European ports policy.
- A Communication on a freight-oriented rail network.

NEW CHALLENGES AND GLOBAL TRENDS OF LOGISTICS SECTOR WITHIN THE CONTEXT OF INTERMODALITY, NEW CONCEPT: LOGISTICS CLUSTERS

The new buzzword in European logistics is *synchromodality*.

The concept is synonymous with the creation of an optimum flexible and sustainable transport system in which companies can choose from a range of modalities at any given moment. Companies are thus always assured of optimum transport combinations and can easily switch between modalities if necessary.

Synchromodal transport networks, in which shippers collaborate, have emerged since a few years.

They are examples of a successful organisational innovation in multimodal transport, and a further step towards developing combined and comodal transport links.

In the next figure we see the evolution from Combined, and Comodal to Synchromodal Transport.

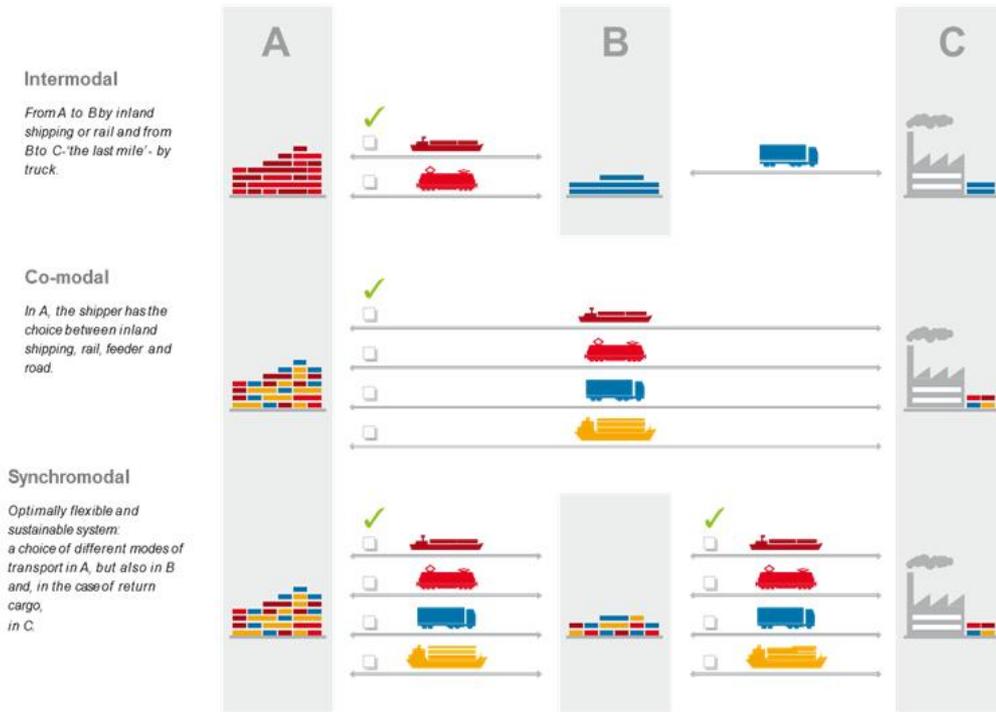


Figure 6: Combined, and Comodal to Synchronomodal Transport.

Comodality: This is the intelligent use of two or more modes of transport by a (group of) shipper(s) in a distribution system - on their own or in combination - to get the best benefit from each mode, in terms of overall sustainability.

A key to comodality is flexibility in the distribution network: switching between road & rail.

A synchronomodal transport network is a hybrid network of different combined and road transport modes, which offers shippers a flexible choice of related transport links, in an effort to optimize the use of all transport modes by increasing the loading capacity of road trucks, rail shuttles, barges and/or inland waterways.

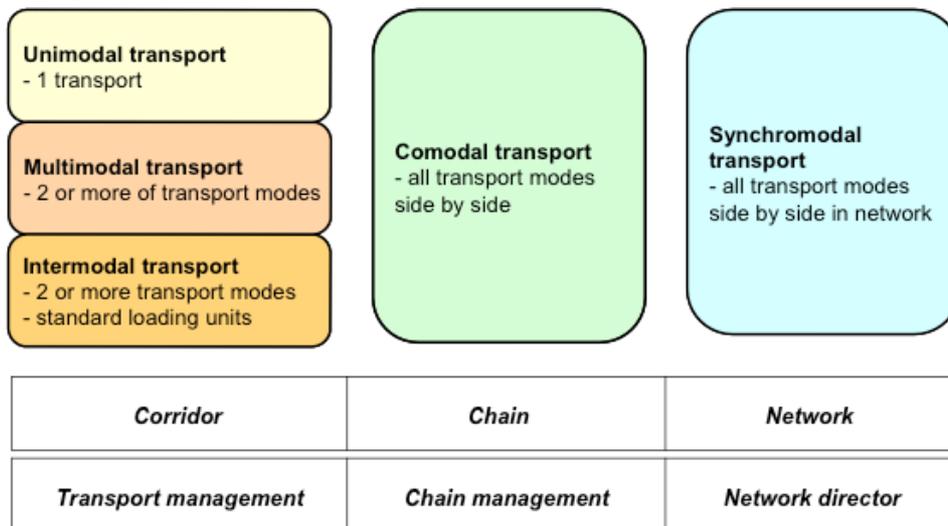


Figure 7: Modal concepts

A new collaborate concept: a logistics cluster

To reply to the new reality in contexts of complexity demand need platforms and networks: logistics centres working in clusters.

What is a logistics cluster?

A logistics cluster is a geographical agglomeration of logistics-intensive operations. It includes mainly three types of companies:

- Logistics services providers.
 - Logistics operations of industrial firms.
 - Manufacturing and headquarters of companies with logistics-intensive operations.
- And which is the role of government in logistic clusters?
- Governments, both on a national and local level, are responsible for much of the infrastructure underlying logistics cluster: ports, airports and roadways. Logistics operations of industrial firms.
 - National governments support the formation of logistics clusters through trade regulation and support, the approval of free trade zones and a general pro-business climate.
 - Successful clusters are places where city, county, state and Federal governments work together with local businesses, academia, labour groups, and other parts of local civil society to attract companies, build infrastructure, and help companies stay competitive in their respective industries.

It opened a discussion about Logistics Platforms concept, on the following questions

- How should we integrate unimodal transport in the logistic platforms?
- Which should be the role of logistic platforms?
- Could be a logistic network the solution for the new global stage?
- Who should be the main players of the logistic cluster?

1.2.- INTERNAL ANALYSIS

This analysis takes the form of a general view of combined transport in Turkey, together with the detailed study of the operation of the different modes of transport in the country.

Accordingly, the analysis has led to key findings that make it possible to draw up the strategic plan. The findings (both strengths and weaknesses) make up the roadmap for the strategic plan for combined transport in Turkey. The critical action points have been drawn up for each area to ensure the immediate implementation of the Plan.

From a holistic and comprehensive point of view, after reviewing the performance of the different modes of transport and the state of the art of logistics in Turkey, and the impact of customs legislation on sector operation, the overall situation of combined transport in Turkey is as follows, taking into account that the methodology used focuses on presenting the distinguishing elements of each mode of transport rather than offering a full description of the actual situation of each one.

General evaluation

Turkey has a privileged geo-strategic location, which is an extraordinary comparative advantage. This physical configuration situates the country as a platform for economic, social and cultural exchange between Europe and Asia.

The investments made by Turkey over the last nine years in transport and communications infrastructure totals 48.7 billion, with the transport sector accounting for 34% of said amount.

These investments seek to contribute to the development of the combined transport network in Turkey along the east-west and north-south axes.

As prior combined experiences, mention must be made of the fact that Turkey has been successfully operating sea routes for some time in the regions of the Mediterranean and Black Seas – routes that have the integrated support of road infrastructure, port facilities and scheduled ro-ro lines from Turkey to Italy, France, Russia, Romania, Ukraine and Georgia.

The network of highways has been developed significantly and the highway length now stands at 64,865 km, of which 2,080 km are motorways.

In the past, the Turkish transport system has invested mainly in the generation of infrastructure for land transport.

Accordingly, the country has one of the largest land transport fleets in Europe.

At the present time, 95% of passengers and 90% of goods are transported by road.

Turkey has a competitive advantage in maritime transports inceptis surrounded by the sea on three sides (Mediterranean, Aegean, and Black Sea), together with the straits of the Dardanelles and the Bosphorus encircling the Marmara Sea. The length of Turkey's coastal borders is 8,333 km.

Maritime transportation is the most popular method of transportation for Turkey's exports and imports, with respective shares of 50.7 percent and 53.2 percent in total.

This is followed by road transportation, with a share of 40.3 percent of exports and 22.9 percent of imports.

Turkey has 10,984 km of railways, operated by the General Directorate of Turkish State Railways (TCDD). Since most of the railways have been in use for quite a long time, the Turkish government is aiming to modernize the system through various projects.

A budget of USD 23.5 billion has been allocated to railway development up to 2023. As a result, TCDD's quality of service will be increased and high-speed passenger train transport will become more widespread.

Regarding air transport, Turkey has 45 airports, 13 of which serve international flights. Turkish Airlines is one of the fastest growing airlines in Europe and the leader in traffic and capacity growth in Europe (AEA, 2009). Turkish Airlines is also the "Best Airline in Europe" (Skytrax World Airline Awards – 2011 & 2012).

Istanbul Ataturk Airport has been selected as the "Best Airport in Southern Europe" (Skytrax World Airline Awards - 2010). In 2010 there were more than 100 million airline passengers in Turkey.

Finally, air transport stands in third place in the ranking for exports and imports.

Analysis of the maritime and port sector

GENERAL OVERVIEW:

Maritime transport constitutes one of the most important modes of transport and a decisive tool for the development of the combined one.

Regarding Turkey maritime transport, both domestic and international, has a paramount importance due to the fact that four of the most important industrial and agricultural areas are close to the sea.

These areas are Istanbul, Izmir, Izmir, Bursa and Adana.

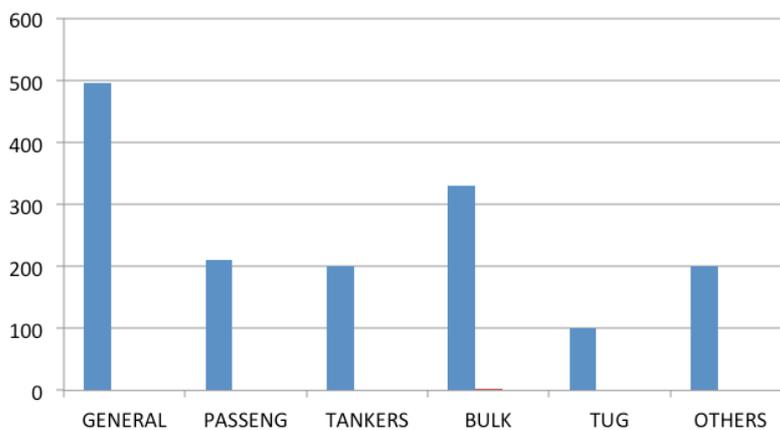
TURKISH MARITIME FLEET

The fleet has experienced the following progression:

TURKISH MARITIME FLEET			
YEAR	NUMBER	GT	DWT
2003	1.148	5.113.414	7.626.847
2004	1.209	4.772.350	7.054.930
2005	1.379	5.228.539	7.603.690
2006	1.429	5.083.855	7.271.050
2007	1.551	5.194.987	7.269.741
2008	1.649	5.658.254	7.521.919
2009	1.722	6.139.176	8.150.588
2010	1.777	6.502.461	8.773.151

Figure 8: Turkish maritime fleet

According to the following classification of ships:



Graphic 7: Distribution of Turkish fleet



By the way and regarding the age of the Turkish fleet presently it is of about 21 years which means that it is a little aged which can represent in many cases evident signs of obsolescence.

New constructions are of optimum quality and the big shipbuilding industry established in Turkey, mainly in Tuzla area, is a very positive factor for the developing of the sector incorporating new and high efficient technologies.

TURKISH PORTS

Regarding ports Turkey, as a consequence of its hinterland and its 8.333 kilometres of coast, has an important net in port infrastructure: all together there are more than 300 ports all types included, half of them are main ports connected to the main road net.

Some of them, such as Samsun and Zonguldak, in the Black Sea; Istanbul and Bandirma in the Marmara area; Izmir in the Aegean Sea; and Mersin and Iskenderun in the Mediterranean Sea are connected also to the railroad net.

Some of those biggest ports were taken into account regarding the manipulated amount of cargo.

TURKISH MARITIME TRADE

Directly linked both with port infrastructures and fleet is the amount and percentages of cargo handled in the Turkish ports.

44 % of the total corresponds to solid cargo; 39 % to liquid bulk; and 17 % to cargo in containers.

The 73 % of former or exports are done by sea; 25 % by shore; and 2 % by air.

About the later or imports, 94 % use the maritime mode; 5 % road and train; and aviation only represents 1 %.

The Turkish shipping sector's experience of the crisis has been paradoxical, like that of other buoyant international economic sectors.

Global business figures have shown a downward or reserved trend in comparison with the record numbers achieved by world shipping between 2005 and 2008.

Despite this containment, however, there are market niches with a high potential for development.

The Turkish port system has two acknowledged competitive advantages:

- Its location on international shipping routes.
- It's recognised and verified know-how in ro-ro.

Putting these advantages to good use, however, depends on connections between ports and the hinterland being strengthened to include some form of added value in the flow of goods.

One limitation is that some Turkish ports have design faults that prevent the potential expansion of their operational areas or even a possible railway connection, despite the fact that the topography of most of the new infrastructure being considered is not an obstacle to turning the port locations into combined transport nodes.

A key point for the Turkish combined transport development are the connections of ports with logistic centres.



Image 1: Example of maximum intermodality in ports

The privatization process of Turkish ports has introduced, among other things, the possibility of adopting best international practices, used by the concessionary companies as their common practices in other parts of the world.

The traditional and respected know how of Turkish port this new privatization process, resulting in a more effective and productive practices, has enriched sector. Furthermore it has help aligning Turkish port procedures and operation with those more competitive at international level.

The adoption of these international best practices has reinforced the idea of the Turkish transport sector regarding the benefits of the bilateral and multilateral cooperation in the starting up of combined transport sector projects such as the Silk Route.

Analysis of the railway sector

General Overview

Turkey has to become the main connection point between Europe and Asia, putting in value Turkish geostrategic position.

From the point of view of the development of railway infrastructures for the combined transport, Turkey shows the following specific characteristics:

- A great geographical extension, with long distances between certain points and the border gates.
- A very rugged topography: only the 46% of Turkish soil can be considered flat, and certain areas have slope rates of 30/1000.

Furthermore Turkey has 11 thousand km of railway networks, including around 800–900 km of high-speed lines, which allows important construction developments in the future.

However the main problem is that most of the existing railway network was constructed long ago, curve radius is very low and it is not adapted for the use of modern technology. This issue complicates the developments that TCDD is willing to take and it becomes quite complicated to solve the technical gaps using the current infrastructure.

In order to improve combined transport Turkey needs regional, national and international level planning and, in regional level, Turkey is due to accelerate border crossings procedures.

Railway traffic: border crossing issues

There are two types of speed: technical and commercial (technical 30 km/h and commercial speed 3.5 km/h). Train compositions: 2 thousand of tons per train. Gross 55 tones per wagon.



Image 2: Railways freight transport efficiency

Transport rate of TCDD: 25 million tons/year, of which only 3 million tons are international. The rest is domestic transport (mainly iron, 4 million tones). 55% (approximately) of Turkish exportation is to Iraq: construction materials, food products.

The traffics "stars": marble, sugar, iron, construction materials. Specializing in determined products has been defined (in Denizli, transport travertine with equipment only suitable for this kind of product).

No coordination between related institutions: not only customs but also police.

Sanitary inspections are difficult to put in place.



Gauge operation takes more time than desirable. Gauge stuff border crossing of TCDD trains: we only have problem with ones that go to Armenia, rest of them are smoothly operated.

Clients and customer services:

Over the meetings held with TCDD staff, it was stated that normally the railways customers present their yearly transport plans to TCDD together with their needs linked to it.

Therefore the management of the commercial operations of TCDD is focused in the preparation of a programming covering the demands received in advanced. According to it, the department of freight transport is the one assuming the responsibility to serve the Market, so the marketing and commercialization tasks have lower importance marketing.

A key point for the Turkish combined transport development is that the main demand of the railway customers refers to punctuality of the service, but TCDD may not always satisfy them.

Clients normally give more importance to punctual delivery than fares.

TCDD Logistic centres and dry ports:

In 19 points, TCDD is building logistic centres. Each of them is close to relevant cities. They are very improved centres in 20 years (potential areas).

TCDD elaborates the construction plan and define with local stakeholders the area for logistic centre (asking for expropriation cost).

A key point for the Turkish combined transport development consists of specializing centres in some kind of goods is an imperative.

The centres have to be put in place in corridors to contribute to their efficiency and productivity.

Empty container areas have to be considered in them.



Road transport

GENERAL OVERVIEW

Turkey exports not only to Europe but also to Asia and even to Africa.

There are 7 (road) corridors of two directions: North-South - and East- West, being the last the most relevant.

Bottlenecks: in East-West corridors with different combined solutions and in North- South corridors some natural obstacles affronted with tunnels.

No plans to develop transportation cities for trucks.

A key point for the Turkish combined transport development consist of the need to exam the efficient operation of combined transport chain.

Besides, connection points play a key role on the corridors and have to be analysed.

Logistic centres

KEY FINDINGS

The Turkish logistic sector currently present the following characteristics, which determine its competitiveness position:

- The sector is highly affected from lack of coordination and collaboration
- Several attempts to develop a Logistics National Master Plan (i.e. Turkish Exporters Assembly).
- There is no direct legislation on logistics in Turkey: the actual discussion is who should be the main actor.
- Regional logistics master plans have been developed under Regional Development Agencies of Ministry of Development. 7 or 8 cities have master plans following the purpose of generating richness through logistics.
- Different bodies can have different logistics centres. In Turkey, logistics centres can be constructed by 30 km distance from each other.
- Ministry of Economy plans to increase sharply Turkish exports; operation of effective logistics centres is crucial to achieve this objective.
- Turkish Exporters Assembly (Turkish main exporters in Turkey belong to textile and automotive sector) plays an active role on the definition of a Logistics Master Plan and Logistics' Law.
- Private initiatives: one logistic centre in Ankara configured as a city terminal (not a logistics centre) providing services at national and international level to trucks.
- Operations in logistics centres have to accomplish exporter's expectations and transit services.

The logistic sector plays a key role in the consolidation of the combined transport. Due to his geostrategic position, Turkey had historically been a bridge between cultures and economies.

There exist a serious confusion about logistics as a whole sector due to the no definition of general policy of logistics centres even in Strategy Papers. After clear definition of Master Plan, brief law can be issued defining very few issues such as incentives.

In tis context, there are investors (road transporters- truck companies- and logistics companies) highly interested but at the same time confused with which institution or how many institutions should be applied for the licenses necessities for putting in place a logistic centre.

Besides, a **key point** for the Turkish combined transport development is the need of a Transport national master plan taking into account different characteristics of regions.

The most important need of the sector is to develop Logistics Master Plan that defines what a logistics centre is, what the basic criteria are for defining the connections and the proximity to transport nodes (ports, airports...).

1.3.-SWOT ANALYSIS

Description of the methodology followed

The SWOT analysis (strengths, weaknesses, opportunities, threats) of combined transport in Turkey is based on information already available, and covers the following areas:

- ▶ General framework of combined transport:
 - Geostrategic location of Turkey
 - Spirit of intermodality in all agents involved in the sector
 - State-of-the-art combined transport in the different global economic scenarios
 - Evolving prospective of the main Asia-Europe-Africa logistics corridors
- ▶ Situation and future development of intermodality in the ports and maritime shipping sector, revising infrastructure facilities and operational requirements demanded by the main actors of the sector.
- ▶ Situation and future development of intermodality in overland transport:
 - road
 - rail
 - potential miscibility of these modes with maritime-port traffic and their integration into the international logistics centres.
- ▶ Situation and future development of the logistics centres in their role as drivers of combined transport in Turkey, always taking into consideration the macroeconomic approach of goods production centres and consumption centres.
- ▶ State-of-the-art customs systems and procedures as a key factor for intermodality.

Firstly, this SWOT analysis has allowed the reality of combined transport in present day Turkey to be shown, thoroughly and in depth, as well as the characteristics that underpin it.

Secondly, it has allowed the identification of what initiatives and actions must be required to promote the creation and management of an environmentally sustainable, economically efficient and socially balanced combined network.

The SWOT analysis is the result of work meetings held by the project team with a number of specialists in the different areas of combined transport in Turkey and the conclusions drawn from the fieldwork carried out during the technical visits to the combined transport infrastructure in Turkey. It encompasses two perspectives:

- detailed, with observations by the experts and the conclusions drawn from the fieldwork;
- summarised, classifying the points according to their importance and impact on the launch of the combined transport system in Turkey.

This SWOT analysis is crucial. Based on the assessment and rating of the strengths and weaknesses of intermodality in Turkey, plans of action were drafted referring to the opportunities and threats under the operating method of how to put a value on the strengths and how to address the potentially adverse effects of the threats.



STRENGTHS	OPPORTUNITIES
<p>Geo-strategic location</p> <ul style="list-style-type: none"> Turkey is located in a strategic location and plays a key role in regional and global integration. The country plays a central role as a bridge between European and Middle Eastern, Asian and Caucasian markets. <p>Political environment</p> <ul style="list-style-type: none"> The privatization and liberalization processes conducted by Turkish governments since the early 1980s have reached success. Transport Public Sector configuration and relations with Private Sector and Stakeholders. Road transport is governed through a recent law and regulations on road transport. <p>Combined aim</p> <ul style="list-style-type: none"> General wish for a national transport policy for enhancing combined transport, in particular of the objectives and the designing of future scenarios for the development of the transport network (modes and nodes). The central government is willing to develop specific legislation to promote combined transport. Turkey is involved in the promotion of technical solutions to improve intermodality (infrastructure and cargo handling services). Incentives are considered to be a key element to promote combined 	<p>Geo-strategic location</p> <ul style="list-style-type: none"> Turkey's strategic position regarding the transit transport between Europe and Asia, as well as Europe and Middle East. The potential for shifting the passenger and freight transport between Turkey, Central Asian Turkic republics and Middle East to railway transport and multimodal port-rail hinterland connections. The increasing demand for transport services in Europe, Asia and the Middle East. <p>Political environment</p> <p>Transport Public Sector Configuration and relations with Private Sector and Stakeholders:</p> <ul style="list-style-type: none"> The re-organization of TCDD is expected to lead to more market driven policies also in the rail sector and that this sector will have an important role in stimulating intermodal transport in Turkey. Other modes require update their legislation. <p>Intermodal aim</p> <ul style="list-style-type: none"> The Ports Operators Association helps the private ports in providing standards.



transport.

- The Ports Operators Association helps the private ports in providing standards.

Modes and nodes

Ports

1.-Market: A huge Turkish offer

- Along 8.333 km of the Turkish coastline exist 300 port facilities and 176 quays and/or jetties capable to attend to vessels with more than 500 GT.
- Recently, the operation of the majority of these ports has been privatized (Mersin) or are in a privatization process.
- Turkish Privatization Administration under Prime Ministry is privatizing public ports.

2.-Turkish Maritime Sector wide experience.

- The environment drives the sector to a new configuration.
- A co-ordination body in a national maritime port system must be analysed by the sector, considering that private operators will run in the near future all ports.

Modes and nodes

Ports

1.-Market: A huge Turkish offer

- The geographical position of existing and potential Turkish ports as convenient nodal and hub points in TEN-T network.
- Increase in the amount of freight due to the establishment of logistic centres.

How to implement:

To define a new national port system could be defined with two possible levels:

1) Port Authorities are public or private managing bodies in charge of ports and terminals located closely in a specific area. Each Port Authority should administrate and develop its port(s) autonomously. It means that each one will have the capability to develop basic infrastructure following a Master Plan that includes projects for new expansions. To develop basic infrastructure, following a Master Plan, which includes projects for further enlargement.

Port Authorities can operate on basis of what the market demands, in competition among themselves.

2) National body for the coordination of the whole port system, from a wider perspective, enhancing the development of national ports in coherence with other modes and nodes in the



network, based on the concept of intermodality, deployed at three levels: infrastructure, services and administrative processes.

This new set-up allows **common rules** and standards on intermodality to be established at different levels:

- Infrastructure: the national body could review Master Plans and projects of Port Authorities in order to check that the connectivity between ports and land transport, as well as connections within ports, is effective. A good layout in the design of ports for rail terminals will provide better intermodal transport services in the future. Both ports and rail modes should include the needs of intermodality in their planning and development in consensus.
- Services and land uses: common rules for providing services, activities or inspections in ports could be promoted by the national body or platform.

This is a key factor to guarantee intermodality in ports. Some port services are being provided by different agents (public and private) in an isolated way forgetting that they are a part of wider transport chains.

Rail transport

How to implement:

Definition of freight railways network: the first step is to define the main flows of goods transport by rail that need action, taking into account the international and national traffic and the nodes involved.

Rail transport

- Political support to railways sector and cooperation with private sector.
- Eligibility of Turkey's geographical structure for efficient long-distance rail transport.
- Commencing high-speed train passenger transport.



<p><i>Logistic centers development</i></p> <ul style="list-style-type: none">• To prepare a Logistics Master Plan.	<p>The creation of a platform for intermodality development in the Turkish transport system represents a change of mind in the rail community. A new culture based on a collaborative process demand oriented, sharing risks and profits with other modes and in general, with the private sector.</p> <p><i>Logistic centres development</i></p> <p><u>Railway terminals</u>: these specific nodes are a crucial matter for the future of rail transport of freight. Rail terminals conceived as intermodal nodes in a common transport network should be planned, promoted and specifically managed with the aim to contribute to intermodality.</p> <p>Designing of main facilities of rail terminals, rail stations and also the services to be provided on them is a subject of importance for both the public and private sectors.</p>
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WEAKNESSES	TREATHS
<p>Political environment</p> <ul style="list-style-type: none"> • There is a need to integrate the concept of intermodality in land use policy and urban plans. In particular, port enlargements in urban areas, nodes connected with them in their respective hinterland and also the location and promotion of logistic centres and regional industrial zones. <p>Transport Public Sector Configuration and relations with Private Sector and Stakeholders</p> <ul style="list-style-type: none"> • There is a demand for better co-ordination within the public sector involved in transport developments. • Administrative procedures in the transport chain are seen to have a negative effect on efficiency. • There is a feeling that many action plans have been tried in the past, but with little result. • There is a general idea that the private sector contributes better than the public sector to the efficiency of transport. Recent experiences in ports privatization reinforce this idea. • The private sector fears that Turkish government intention for specific legislation to promote combined transport legislation could increase the administrative burden. 	<p>Competitive environment</p> <ul style="list-style-type: none"> • Regional conflicts that may interrupt transport services with the neighbouring countries. • Narrow implementation period for EU funded actions. • The future implementation of North-South transport corridor Russia-Iran-India may threaten the role of Turkey between Europe and Asia. • Competition intensified with other Mediterranean ports. <p>Transport Public Sector Configuration and relations with Private Sector and Stakeholders</p> <p>Private Sector makes its own way.</p> <ul style="list-style-type: none"> ✓ How to avoid: <ul style="list-style-type: none"> • Put in place a leading role of the Ministry of Transport, Maritime Affairs and Communications as a key solution.



Core transportation net

- A lack of infrastructure.
- The actions adopted by the public sector mainly focus on the supply side and not on demand.
- Difficulties appear also when different public agents have to coordinate.
- Underdeveloped north-south transport corridors.

Ports

1.- Privatization process:

- The ports privatization process is partial. The process has been materialized through concession contracts on basis of different financial schemes (such as *BOT*, build, operate and transfer).
- During the first five years of the concession period, the contract obliges the private port operator to establish a maximum tariff similar to those established by TCDD in ports operated by this railway operator.
- After this period, tariffs applied by port operators will be free.
- The maximum period of a concessional contract is 49 years, but depends on the evaluation of port assets and investments.
- Conventional type port infrastructure and lack of specialized container port system.
- Inadequate infrastructure in some ports and their hinterland.

2.- Short Sea Shipping:

- The development of Turkey's short sea shipping needs attention.
- The coastal fleet in number and quality needs to be updated.

Core transportation net

- The imbalance among different modes in favour of road transport.
- Insufficient hinterland access, particularly in terms of railways.
- Insufficient large-scale ports to be transit points to serve in TEN-T network.
- Inadequate connection between national networks and regional growth poles.

Ports

1.- Privatization process:

- The rapid transfer of port operations to private companies has produced some conflicts between the public and private sector. These conflicts affect directly intermodality.
- ✓ How to avoid:
 - Designing and implementing a co-ordination mechanism for the national port system in order to guarantee that ports will be fully integrated in the transport network.
 - During the process, it will be possible to introduce rules for port operators aiming at combined investments and operations.



Rail

- It needs to improve the rail transport, particularly the connectivity with ports and land transport and their nodes.
- The improvement of safety in rail transport is necessary to have a balanced market.
- A percentage of 95% of the rail network is single tracked and 75% is not electrified. The maximum axle load is 22.5 tonnes on 37% of the network and 20 tonnes for the rest. The maximum axle load is a key factor in defining the capacity of the rail network.
- It is important to complete infrastructural connections by rail to freight centres in industrial zones due to the capability of rail for the transport of bulk cargoes.

Road

- Insufficient superstructure and geometrical standards on highways
- Insufficient hinterland access, particularly in terms of railways.
- Low road and railway density.
- Mostly old single-track rail network and lack of high-speed railways between large cities.
- Worn-out highway pavement due to high share on roads of freight and passenger transportation.

Logistic centres:

- The characteristics of logistic centres in Turkey differ very much, with the consequent malfunctioning of private activities.
- There is a problem in the coordination between ministries on construction procedures of these centres.
- There is a need to determine prior criteria on basic facilities of these centres, such as multimodal services inside the centre and proximity to road, railways and airports.
- Development of logistic centres is requested, based on common

Logistic centres:

How to avoid:

It should be implemented Single windows integrating Administration to Administration (A2A), Administration to Business (A2B) and Business to Business (B2B) processes linked to intermodality development are needed. Standards in ICT (Information and Communication Technologies).



criteria and standardized rules by central government.

Customs and technology platform

- Administrative procedures in the transport chain are seen to have a negative effect on efficiency.
- Road transport is governed through a recent law and regulations on road transport.
- The level of the administrative process, customs and other inspections do not cover rail mode in the way that the market is demanding.

The SWOT matrix described on the foregoing pages can be summarised as follows:

Strengths:

- Geographical configuration of Turkey as a logistics platform between Europe and Asia.
- Road transport sector with size and experience.
- Turkish ro-ro shipping sector that is consolidated and well-positioned in its area of influence.
- Active presence of multinational logistics companies.

Weaknesses:

- Obsolescence of certain shipping and railway infrastructures.
- Lack of a National Logistics Plan to define corridors and the locations of centres.
- Presence of players that are not fully professionalised in road transport.
- Competition based on negotiations with customers to agree low prices.

Opportunities:

- Maintenance of expectations for growth of transport worldwide.
- Growing, sustained economic development of Turkey up to 2020.
- Growth of Turkish production sectors.
- Programmes for the modernisation of railway infrastructure already in progress.

Threats:

- High volume of investment required.
- Gradually radicalised international competition.
- Disorganised emergence of new logistics centres.
- Goods loading/unloading procedures far in excess of those desired by customers.
- Disconnection of customs procedures and transport operations due to complex operational procedures.

In summary, it can be said that the route towards intermodality in Turkey shows the following characteristic features:

- it is based on evidence: the geo-strategic positioning of the country as a logistics platform between the flows of traffic (Asia-Europe-Africa);
- it has been progressively equipped with first class infrastructures in the road sector and projects have been defined to prevent bottlenecks which make international transit difficult;
- it maintains an outstanding maritime operation;
- a privatisation process of its ports has been started in order to move to efficiency and;
- it begins to cover the country's rail operation requirements.

These features should help to confront the threats and take advantage of the opportunities by reflecting the value of the country strengths.

2.-STRATEGIC FORMULATION

It consists in the formulation of the:

- Mission
- Vision
- Values

of the Turkish Combined Transport.

2.1.- MISSION

"Contribution to improvement of Turkey by formulation of policies, regulations, plans and projects that guarantee a National Combined Transport System based on a Transport and Infrastructure network with international quality standards comply with economic, social, environmental guidelines and national development plan".

2.2.- VISION

To be the main line of national and regional development through the efficient management of national and international goods flows and their operation from combined infrastructure and logistics with high standards in efficiency and quality.

The vision of combined transport in Turkey must contribute to the national challenge for the year 2023, which marks the centennial of the Foundation of the Republic. The programme includes challenging targets for the transport and logistics sector in Turkey, such as the following:

- 16 new large-scale logistic centres
- 36,500 km dual carriageway, 7,500 km motorway
- 70,000 km with bitumen hot-mix asphalt
- In 2019, an under sea tube and the 3rd bridge on the Bosphorus
- Bridge on the Dardanelles
- 10,000 km high-speed railway, 4,000 km additional railway
- 8,000 km with electricity and signalling
- 500 km railway will be renovated annually
- Opening up of railways to the private sector
- Renovation of terminals and stations and construction of new terminals for high-speed trains
- Support railway projects to connect with the Caucasus, the Middle East and North Africa
- New airports, 400 million passenger capacity (165 million)
- 3 new airports in Istanbul
- 750-plane fleet (200 regional)
- Connection of main ports with railways
- Transfer ports in Aegean/Mediterranean/Marmara/Black Sea
- Having at least one of the top 10 ports in the world by 2019
- 32 million TEU handling capacity for container transport
- Handling 500 million tons of solid and 350 million tons of liquid load
- 10 million DWT shipbuilding capacity



2.3.- VALUES OF COMBINED TRANSPORT IN TURKEY

The values highlight the fundamental and characteristic features of the Turkish Combined Transport System, constituting a point of reference and roadmap for its operation.

These are the values:

- Service: provide Turkey and the Turkish people with transport services that improve their quality of life.
 - Quality and continuous improvement: meet and exceed universal standards.
 - Free competition: guarantee and maintain rules for competition, protecting the rights of customers and citizens.
 - Openness: accept and adopt new ideas, proposals and focuses in ways of doing combined transport to optimise service levels and answering the country's needs.
 - Efficiency: achieve the programmed targets and goals using the resources available in a set time, improving the capacity for achieving said targets and goals in terms of place, time, quality and quantity.
 - Effectiveness: optimise the rational use of the resources available with proven operating models.
 - Loyalty: fulfil and ensure fulfilment of the Mission, Vision and Values above private interests.
 - Participation: enable participation of stakeholders and ensure the protection of their investments.
- Transparency: prepare, maintain and distribute information and statistics about goods and traffic flows.

3.- STRATEGIC PLANNING

Consists in formulating the following:

- Critical success factors
- Future scenarios of Turkish combined transport.

3.1.- CRITICAL SUCCESS FACTORS

Identified from the SWOT analysis, critical success factors constitute the key elements to ensure that combined transport fulfils its mission and covers the operational objectives specified in the strategic map.

Compliance with these factors enables the consideration of strategic alternatives that will define the future of combined transport in Turkey.

This is a non-comprehensive exhaustive list of all the issues that need to be addressed by combined transport in Turkey.

They are as follows:

- Institutional coordination of intermodality.
- Model for studies of goods and traffic flows.
- National system for the distribution of transport statistics.
- Origin-destination matrices according to producer region and traffic area.
- Combined transport infrastructure map.
- Master Plan for Transport on a national scale, taking into account regional particularities.
- Bilateral cooperation agreements with neighbouring and coastal countries for the promotion of combined transport.
- Model for incentives for combined transport: supply, demand and barriers.
- Single contract for combined transport.
- Connectivity of ports with logistics centres.
- Solution for congestion in the area of Istanbul.
- Optimised railway infrastructure.
- Amendment to legislation on weights and road traffic regulations.
- Methods for optimising land intermodality.
- Delimitation of border points for imports.
- Logistics Sector Law.
- Logistics map of Turkey: corridors, centres, dimensions.
- Railway logistics centres integrated in production chains.
- Specialisation of combined and logistics centres.
- Intermodality operation models (in shipping and railways) that confirm customers' requirements and the geographical and economic demands of production chains.
- Reduction of combined operating times, unloading and loading throughout the chain.
- Model for optimising cabotage services, drawing up a policy for promotion.
- Combined transport management systems.
- Development of short sea shipping.
- Port Community System.
- Customs procedures in line with combined operating requirements and customers' expectations.
- One-stop window system.



3.2.- FUTURE SCENARIOS

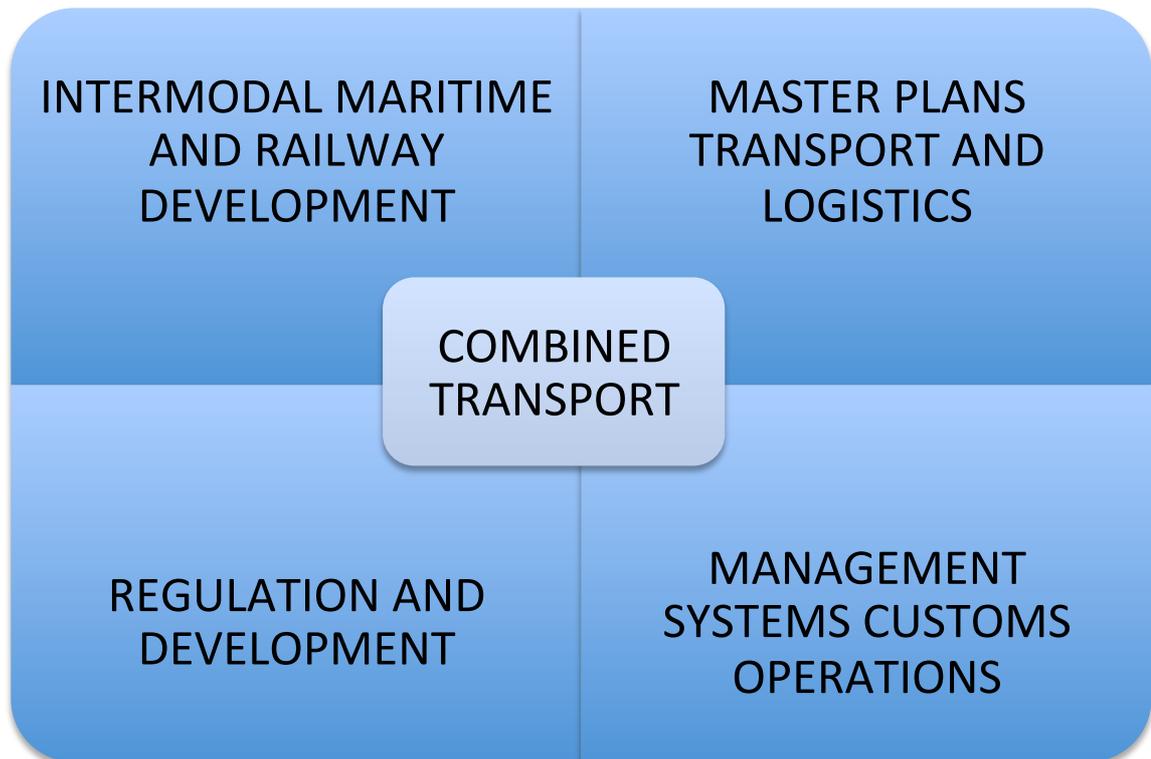
Public-private partnership models will be widely implemented for transportation infrastructure investments, and traffic safety will be increased in all transport modes, with maritime safety being given priority.

In freight transport, priority will be given to rail and maritime transport, while ports will become logistics centres that facilitate combined transport.

Although logistic services are new in Turkey, the sector is growing rapidly. Standing at the crossroads of major trade routes makes Turkey an important candidate to become a logistics centre in the future.

4.- STRATEGIC OBJECTIVES OF THE TURKISH COMBINED TRANSPORT SYSTEM

The Turkish Strategic Plan for Combined Transport is developed in the following four priority strategic objectives issues (areas of priority action):



Graph 8 : Turkish Combined Transport Strategic Objectives

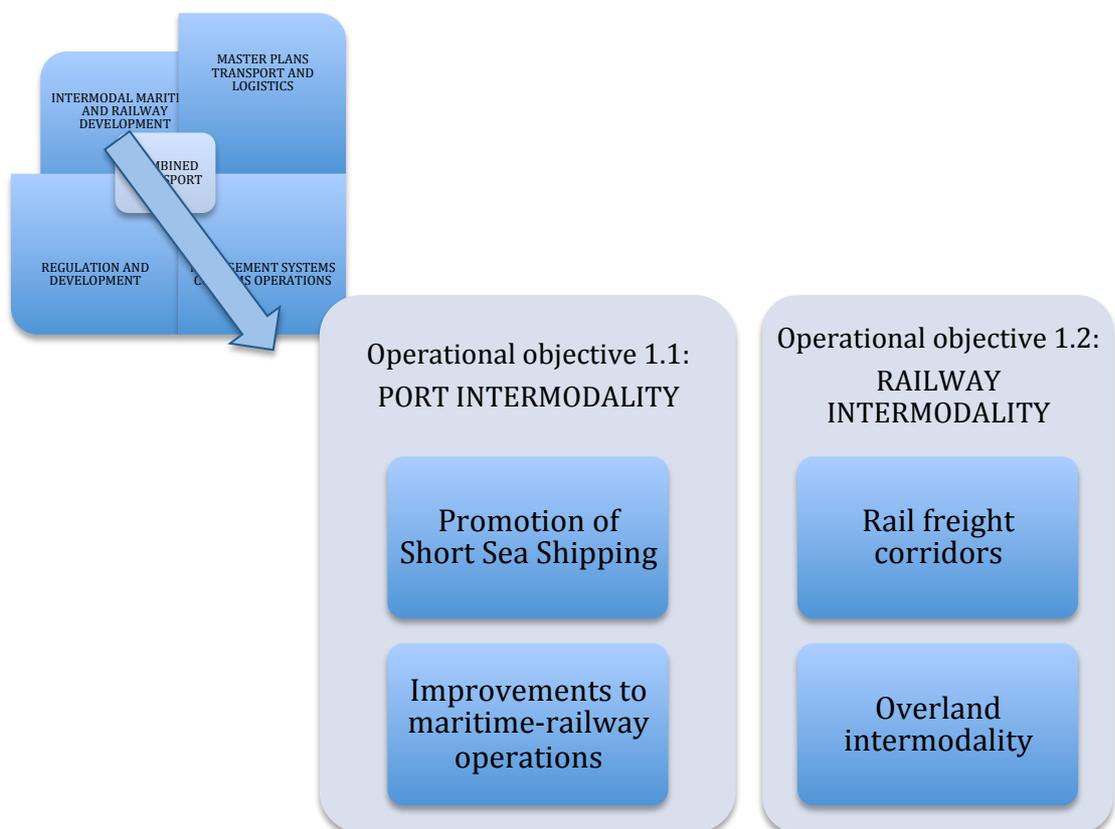
5.- DEFINITION OF THE OPERATIVE OBJECTIVES OF THE TURKISH COMBINED TRANSPORT SECTOR

From the interaction between the four strategic priority areas of the Combined Transport in Turkey and the issues analysed on the SWOT matrix, a series of **operative objectives or action lines**, have been obtained in order to support the strengths and opportunities of this type of transport as well as diminish its weakness and threatens.

By linking the operative objectives to the strategic objectives, it will be clearly shown which main actions lines should be implemented in order to successfully achieve the ideas behind this Turkish combined transport Strategic Plan.

STRATEGIC OBJECTIVE 1: INTERMODAL MARITIME AND RAILWAY DEVELOPMENT

The operational objectives affected by strategic objective 1 are shown in the following figure:



Graph 9 : Turkish Combined Transport Strategic Objective 1: operational objectives

OPERATIONAL OBJECTIVE 1.1 PORT INTERMODALITY

JUSTIFICATION

Global maritime traffic and port activity framework

The last 50 years have seen an extraordinary growth in international trade that has brought a growing need for bulk transportation with it. In other words, a pressing need for maritime transportation.

On the other hand, globalisation, understood as 'a global or worldwide way of doing things with respect to scope or application' has become a multi-sectorial imperative, with trade and transportation being no exception: a good part of industrial production has attained an international character in light of the fact that companies are looking to locate their production in areas where it can be carried out more cheaply.

The transportation of goods to the consumer represents a small percentage of their sales price. Increased production in a cheaper location, or the purchase of cheaper end products, easily offset any additional transportation costs.

The location of production a long way away from the consumers has therefore led to a massive increase in the need to move goods by sea as well as to a concentration of maritime freight shippers.

In the same way that the producers are trying to reduce their costs by seeking out cheaper production locations, the transport operators are attempting to reduce their costs by generating economies of scale and improved productivity.

Maritime traffic, particularly of the deep sea variety, follows the development of the world economy. Containerisation has contributed towards the growth of this form of transportation because the sector's leading companies have focused on container traffic via a faster and more efficient handling operation based on physically larger and more economically viable ports.

The deep-sea maritime routes have been definitively configured from east to west instead of from north to south, and this has resulted in the establishment of longer distance routes and larger interchanges between Europe and Asia.

In the future, the key questions as regards maintaining the sustained growth of the maritime transport sector will be speed combined with concentration in a small number of ports classified as "mega hubs" or "mother ports".

The liberalisation of the commercial interchanges and the fierce competition among an increasingly smaller number of sea shipping companies have had an extremely serious impact on the organisation of and the regional role played by the ports, which have seen themselves being forced to meet the increasingly demanding requirements of the shipping companies, which are competing among themselves for the business of the freight forwarders who are, in turn, looking for faster, safer and cheaper port-to-port transportation.

In this climate of aggressive competition, the battle between the shippers and the ports is being played out on dry land where the greatest productivity gains can be generated.

The Applied Research Centre in Maritime Economics (ISEMAR) described the following scenario in its Report No. 42:

"Liberalisation has resulted in all commercial ports finding themselves in a situation where local and regional interests are increasingly making way for national and international structures. The external nature of the decisions that affect the life and economy of the commercial ports is nothing new.

However, it is continuing and getting faster, and it is also beginning to affect secondary ports. Port activity is becoming increasingly tied in with the commercial companies, with the trend being towards ever more autonomous terminals".

Ports, transport interchanges and maritime and overland networks

The development of a port is closely linked to that of the territory in which it lies.

The dynamic of a port can be understood from the **port situation** point of view, which means that the port forms a relevant part of its surroundings.

This port situation is determined by the integration of several stopovers within a process that brings the maritime, port and overland activities together.

Nowadays ports have to function as a combination of port operation and transport network spaces.

In other words, they must adopt an approach that is both **polarised** and **nodal**:

- ✓ with respect to polarised logic, the port is a central area in which the use of the space, the foreland and the hinterland is organised.
- ✓ as regards nodal logic, the ports functions as the hub where different networks come together.

The port foreland: types of maritime traffic

The **foreland** of a port (its external area of influence) can be defined as *"the maritime projection space within which the port maintains trade links or the group of markets reached by way of the connected points"*.

A port's external area of influence consists of the all the other ports with which it makes regular exchanges.

Port-to-port maritime transportation can be divided up into two major categories:

the transportation undertaken by large vessels over long distances (deep sea) and short distance maritime transportation (Short Sea Shipping), which includes the motorways of the sea, feeder, cabotage and microcabotage, and river-sea transportation.

Cabotage

This refers to coastal shipping that does not involve sea or ocean crossings.

It includes different types of transportation with respect both to distance travelled and regularity.

Cabotage is based on three techniques:

- transportation of bulk goods,
- transportation in containers and
- roll on/roll off cargo (Ro-Ro).

As far as regularity is concerned, cabotage can be divided up into:

- traffic linked with a regular line;
- traffic that can be compared to a seagoing "bus" that runs regularly from port to port;
- irregular traffic ("tramping");
- traffic linked with making the most of specific opportunities ("spot");
- traffic dedicated to the operation of a specific industrial project.

Feeding or inter-port complementarity

This consists of combining transoceanic container traffic with short-distance traffic.

The oceangoing vessels transport the containers to the main ports (central ports or hubs), from where their contents are redistributed in smaller vessels sailing to secondary ports.

This operation is linked with the masification of cargo flows and the increase in the size of the vessels.

Feeding is therefore structured upon a group of complementary ports situated in the vicinity of the main port.

This operational process obeys a nodal logic and is, therefore, established within the port platform and the worldwide and regional maritime networks that do not involve the hinterland.

Definition of hinterland

The hinterland or internal area of influence of a port is "the area of economic impact on dry land and is defined by commercial considerations rather than by simply geographical ones".

It is the area that houses the source and the destination of the goods that use the port. It depends on the level of economic activity and of competition between the different modes of transport, as well as on intermodality.

The hinterland of a port is different for every one of the products transported.

Each product type has a different logistical chain.

The way in which incoming products enter a hinterland is based on the consumers it contains and on the modes of transport via which they can be accessed, while outgoing products leave a hinterland based on production areas.

With respect to bulk products such as construction materials, timber, raw materials or chemical products, distance is fundamental: the priority is to limit the distance over which these are transported by land. For this reason the port used for handling this type of traffic will normally be close by and the hinterland will cover a small area.

As regards manufactured goods transported in containers or on trailers, time is a fundamental factor: for this reason the accompanied traffic is centred on a short-distance sea route, while the unaccompanied traffic will probably take a long-distance route.

Ever larger vessels have resulted in a reduction of calls, and this has generated a relevant concentration of port activity in those areas with a greater concentration of consumers.

The upshot of this is that the larger ports have grown at the expense of the smaller ones.

The products are transported from one or two ports of call via a hub and spoke distribution system.

This can either be achieved by sea via a feeder network (that possibly requires a final leg by land) or by road to the final destination.

In short, a port has an immediate hinterland that houses the production and consumption areas of its region, along with an interior area, namely a non-exclusive hinterland, within which it will compete with other ports and the size of which will depend on the connections between it and the transport network.



The Turkish port sector within the context of maritime traffic

The size and outlook of the Turkish port and maritime transportation sector are of international proportions and they play an essential role in the implementation of the country's foreign trade.

Seventy-three percent of Turkey's exports and 94% of her imports are moved by sea.

Having said this, although this mode of transport is the most important in Turkey due to the volume of goods that it moves, if one takes a closer look at the data regarding the transportation of the country's domestic national traffic, its roads have played a dominant role with respect to port-to-port transportation ever since the 1950s.

The data speak for themselves: taking 2010 as our base, 89.4% of goods and 91.7% of passengers were transported in Turkey by road.

Turkish society as a whole is aware that this situation has many inherent negative external factors on both a national and international level that are fundamentally the result of the accident rate, the loss of economic resources caused by congested roads and the negative environmental impact that the domination of wheeled traffic represents.

One detrimental factor is that many of Turkey's trunk roads still run through the middle of a significant number of the country's most important and densely populated towns and cities, as occurs in the area of the Black Sea where major highways bisect Rize, Trabzon, Giresun, Ordu and Samsun.

This situation worsens the general harmful aspects mentioned above and reduces the efficiency of the transportation process: for example, on the road journey from Rize to Samsun the flow of traffic is constantly interrupted by the traffic lights installed in the cities bisected by the state trunk road.

Under circumstances such as these, short sea shipping and, above all, cabotage constitute a solution that, if enhanced, would go as far as possible towards mitigating the negative effects engendered by this predominant use of roads for moving goods around within Turkey and resolving the problems derived from this severely unbalanced approach to transportation.

Short Sea Shipping will play a fundamental role in making combined transportation a success in Turkey due to the following reasons:

Turkey is a maritime nation due to its 8,333 kilometres of coastline and over 150 ports used by international traffic.

The location of the main industrial and agricultural production areas in the vicinities of major ports such as Istanbul and Bandirma in the Marmara area, Samsun and Zonguldag on the Black Sea, Izmir on the Aegean Sea and Mersin and Iskenderun on the Mediterranean Sea.

These ports maintain active and efficient connections with the road and rail networks.

The Turkish road network consists of 65,049 kilometres and not only links all of the country's regions, but also runs around the coastline connecting all of Turkey's ports.

Turkey's principal port facilities are also connected to her rail network.



Image 3: The Turkish road network

The above image shows Turkey's national road network.

Turkey's Road Infrastructure Investment Plan includes an asphaltic mixture road surfacing programme that will make it easier for heavy goods vehicles to move around the country. Twelve thousand four hundred and fifty-two kilometres of the network have already been surfaced using this mixture.

The following illustration shows the new road projects.



Image 4: New road infrastructure projects

In short, road transport faces a stable situation in the short and medium terms.

Turkey currently has a rail network of 11,940 kilometres with a 5.3% market share with respect to the transportation of freight and 1.6% as regards passenger transport. In other words, its share is insignificant in relation with that of Turkey's roads.



Image 5 : The Turkish rail network

There is plenty of room in Turkey to develop rail freight traffic, although as the map shows the rail network already connects the ports of Samsun, Zonguldag, Istanbul, Bandirma, Izmir Mersin and Iskenderum, thereby opening up a whole host of possibilities with respect to the development of Short Sea Shipping.

Turkey's national rail network includes 452 kilometres of branch lines connecting it to existing stockpiling and loading centres (logistics-industrial parks), namely facilities of the utmost interest for the launch and commissioning of profitable and efficient short sea shipping lines, with other logistics centres currently in the planning phase.

To sum up, the proposal is as follows: given the current situation of her transport system, Turkey must seriously consider Short Sea Shipping as a viable alternative to tackling the problems being caused by the mode of transport presently being used to move domestic goods around the country.

Furthermore, Short Sea Shipping will make an efficient contribution towards integrating the Turkish national network with the following principal transport corridors: Asia-Europe, Istanbul-Kars-Tbilisi-Baku, Kurtalan-Nusaybin-Iraq, Kavkaz-Samsun-Basra, Istanbul-Aleppo-Makah and Istanbul-Aleppo-North Africa, as shown in the map below:

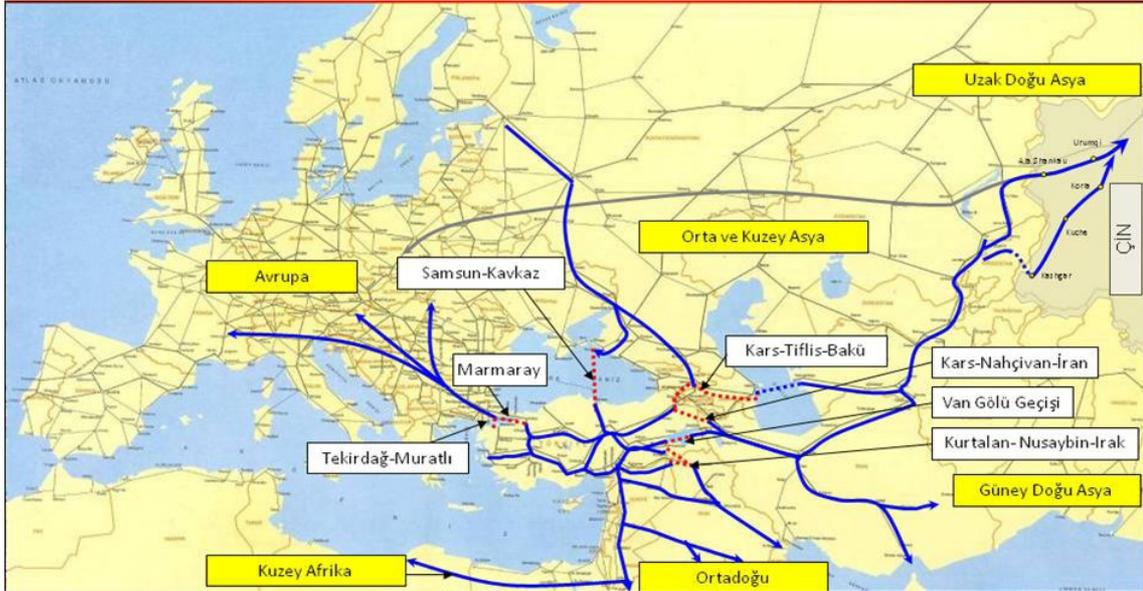


Image 6 : Main Asia-Europe transport corridors

ACTION PLANS OF OPERATIONAL OBJECTIVE 1.1

The Turkish Port Intermodality Improvement Plan is implemented in the following action plans:

1.1.1.- The Promotion of Short Sea Shipping

1.1.2.- Sea-Rail Operational Improvement.

OPERATIONAL OBJECTIVE	PLAN OF ACTION	LINES OF ACTION
1.1.- MARITIME SECTOR	1.1.1. Boost for short distance sea transport	1.1.1.1.- Analysis of the commercial flows amenable for using Turkish short sea shipping (SSS) routes
		1.1.1.2.- Study of the Current Short Sea Shipping Supply in Turkey
		1.1.1.3.- Identification and selection of SSS routes as per model of optimization of the volume of traffic and general cost of transport.
		1.1.1.4.- Formulation of routes and scenarios: endowment of infrastructure and superstructure needed and investment required for the routes selected. Services to be provided
	1.1.1.5.- Definition of a country level model so as to examine the economic and social feasibility of a SSS route	
1.1.2. Land-Sea Operational Improvements		1.1.2.1: Establishment of a Technical Commission for port-rail intermodality
		1.1.2.2.: Fomenting of public-private dialogue

Table 1: Action plans and lines for Operational Objective 1.1



Plan 1.1.1: The Promotion of Short Sea Shipping

The European and Turkish modal patterns are subject to a series of limitations that impede the balanced distribution of the load.

The European Union defines Short Sea Shipping as the movement of goods and passengers by sea between ports situated in Europe or between non-European ports located in nations whose coastline forms a frontier with Europe.

This is a combined transportation alternative the feasibility of which depends on:

- the potential traffic,
- the existence of a regulatory and institutional framework and of suitable policies,
- the concurrence of commercial and financial factors and the will and vision of the producers and of the logistics and transport operators.

Short Sea Shipping involves the development of international and domestic maritime transportation, including feeder services along the entire coastline as well as to and from islands and lakes and up and down rivers.

On a European level, the definition of Short sea shipping also applies to the maritime transportation between the members of the Union and Norway and Iceland, as well as with countries situated on the Baltic, Black and Mediterranean Seas.

In light of the environmental effectiveness epitomised by Short Sea shipping, the European Union has made significant efforts to design and implement an active policy to promote it aimed at reducing the volume of goods moved by road throughout Europe.

Bearing in mind her more than eight thousand kilometres of coastline and over 300 ports, in Turkey Short Sea Shipping can provide a complementary and efficient solution to the extremely dominant and contaminating movement of goods by road.

Internationally speaking, Short Sea Shipping presents the following advantages within the combined transportation scenario:

- port-to-port movement governed by a single contract
- reliability
- respect for the environment
- guaranteed transit times.

Having said this, these benefits are offset by the difficulties faced by the development of Short Sea Shipping in all those nations interested in promoting and increasing its use, difficulties that are frankly similar to those met when trying to get more freight onto the rails.

They are the following:

- the complexity and rigidity of the intermodal operations.
- the need for a minimum critical mass of daily, monthly and yearly goods movements required to ensure the viability of the lines.
- rigorously established merchandise transit and delivery times that might be affected by numerous variables beyond the control of the operator of the route.
- the need for legal-contractual guarantees for the fulfilment of lead times.



Furthermore, in order to ensure its future development and implementation the Short Sea Shipping operators have to offer the current and potential market:

- effective terminals that are specialised by traffic type,
- service frequencies adapted to the demands of the logistics and transportation chains, and
- ad hoc defined customs procedures.

The operating cost and flexibility of the terminals constitute, therefore, the critical factors for the development of the Short Sea Shipping service.

It must be stressed that the fact road transport does not require customs procedures represents a disadvantage for Short Sea Shipping with respect to the dominant modality.

To avoid this drawback the Short Sea Shipping operators must guarantee that any customs procedures (applicable to Short Sea Shipping) are simple, fast and integrated with the documentation used in road transportation in order to prevent these procedures from hindering the implementation thereof.

In short, the **promotion and implementation of Short Sea Shipping in Turkey** will require analysing the viability of developing ad hoc lines for the freight traffic flowing between ports that replace the traditional road routes presently dominant within the country.

Based on the results of this analysis of the viability of possible and different routes, the steps that need to be taken in order to guarantee the development of Short Sea Shipping in Turkey shall be planned to help towards eliminating many of the long-distance road routes and thereby reducing times and costs, in short to ensure the implementation of an efficient combined transportation system.

The specific objectives of the promotion of Short Sea Shipping are:

- To analyse the interchanges of goods currently being carried out using this modality and determining the weakness and strengths of the model.
- To identify, define and model potential Short Sea Shipping routes (making these attractive to the operators) that are likely to meet the requirements of the market in an operationally efficient and financially profitable manner.
- To analyse the viability of the proposed Short Sea Shipping routes based on the financial results forecast via the definition of business models in accordance with the principal type of goods to be transported.

In order to develop all the potential of the short sea shipping process Turkey shall have to have logistics chains that are completely integrated and to offer door-to-door services to the customers.

The logistics chains would have to be managed and marketed by a single company, thereby offering a single contact point that is responsible for the entire intermodal chain.

It is highly recommendable to reinforce the Turkish Centre for the Promotion of Short Sea Shipping and to provide it with contents, thereby assigning it with responsibilities with respect to the development of this Plan.

This Plan is built around the following lines of action:

1.1.1.1.- Analysis of the trade flows likely to move along Turkish Short Sea Shipping routes

This consists of processing the information in a statistical manner and analysing the Turkish trade flows that are likely to use potential Short Sea Shipping routes.

The analysis of the flows shall provide the identification of traffic by type and distinguish it by mode of transport and geographical area.

Once the base data on which the analysis shall be carried out have been obtained, the next step shall be to calculate the year-on-year transportation demand and break this down by mode of transport, source or destination region of the export or import and European country of destination (with respect to exports) or source (as regards imports).

1.1.1.2.- Study of the Current Short Sea Shipping Offering in Turkey

This involves the analysis of:

- The movement of merchandise from the Turkish ports inland and from inland to the ports
- The Short Sea Shipping services currently being provided
- Sea and land freight forwarding prices
- Transit-Time
- The selection of ports suitable for the type of goods to be handled

The result shall be an inventory of the Short Sea Shipping routes currently in operation.

1.1.1.3.- Identification and selection of Short Sea Shipping routes in accordance with traffic volume optimisation model and generalised transportation cost.

This involves simulating the transportation chains and the corresponding transportation costs that the Turkish companies would assume should they opt for the distribution of their goods using Short Sea Shipping routes.

The first step in the simulation exercise shall be to compile a list of the average costs of transporting goods to the different ports in Turkey, of the average freight forwarding services which link the source ports with those situated at the other end of the proposed route (and, in the event of the service not currently existing, the approximate freight forwarding cost charged by the means of transport that would represent the direct competition of the new short sea shipping route to be established).

In order to complete the generalised cost, information about the average costs of transporting goods from the destination port to the final destination point in the hinterland shall be gathered.

Next, a software program shall be designed that is capable of simulating the transportation chain to be followed for each operation and the costs associated therewith in the event of opting for distributing the goods by sea.

The result of the simulation shall provide the total transportation costs that should have to be paid in accordance with the total volume of goods to be transported via each of the possible Short Sea Shipping routes to be studied with respect to each source-destination pairing.

The generalised transportation costs of the trade flows with the countries in question via Short Sea Shipping routes shall be simulated for each combination.

The optimisation criteria shall be the maximisation of traffic volume and the minimisation of the generalised transportation costs of the Turkish trade flows.

Without being limitative, the Short Sea Shipping route selection criteria must consider:

- the impact on local traffic,
- the operational relationships with the load generators,
- the cost of the operations.

The result shall be a map of the Short Sea Shipping routes to be established from the Turkish ports.

1.1.1.4.- Formulation of routes and scenarios: allocation of necessary infrastructures and superstructures and investment required for the routes selected. Services to be rendered

This line of action means determining:

- The selection of ports suitable for the type of goods to be handled by the Short Sea Shipping route
- This consists of establishing a number of minimum characteristics that all the ports included along the different routes proposed shall have to possess.
- These minimum requirements must guarantee the level of service offered and include:
 - ✓ Infrastructures
 - ✓ Equipment
 - ✓ The planned availability of different alternative routes
 - ✓ Voyage times and times spent in port
 - ✓ Services to be offered:
 - Ports of origin and destination
 - Frequencies
 - Volumes
 - Special equipment

This line also includes an assessment of the investments required for setting up and operating the routes selected by applying the model described.

Investor shall break down the required investment: port operator, terminal operator and shipper.

The investments assessment shall be carried out bearing in mind not only the requirements in terms of infrastructure, but also with respect to superstructure and vessels.

The investments assessment analysis shall be carried out for a diverse series of transportation solutions: roll on/roll off (ro-ro) sea transportation, containerised transportation and goods loaded in containers and transported in adapted ro-ro vessels.

The results of this task shall provide the investments to be made by the different agents that make up a Short Sea Shipping route, expressed in terms of the total volume to be invested per agent and per tonne to be transported via the route considered throughout the specialised terminal concession period.

1.1.1.5.- Definition of a countrywide model for analysing the economic and social feasibility of a Short Sea Shipping route

The social benefits and impacts generated by a Short Sea Shipping route shall be estimated.

The benefits of the Short Sea Shipping route, such as reduced logistical costs, its impact on the organisation of the sector, the overall optimisation of the transport system due to the reduction of road traffic, etc. shall have to be taken into account together with any other factor that the consultant deems relevant.

Likewise, the benefits generated by the new activity in terms of its dynamizing effect upon the local and regional economy of the area in which it is implemented must be considered as this is deemed to be one of the most relevant aspects to come out of the development of projects of this nature.

This line represents the analysis of the profitability-risk of the Short Sea Shipping route creation projects for the different agents involved.

The first aspect to be evaluated is the **financial profitability** of the project to be implemented from a technical point of view. This shall involve bearing in mind the need to undertake the construction of new infrastructures due to the fact that a specialised terminal dedicated to Short Sea Shipping is required.

Secondly, the **financial profit** that the **terminal operator** who manages and handles the traffic using the route can expect to make shall be analysed.

Finally, the **profitability** of the business run by the **shipper** who offers the maritime transportation service using the proposed Short Sea Shipping route shall be studied.

It is possible to add risk assessments to the resulting profitability figures in accordance with the extent to which these analyses incorporate the stochastic modelling of the forecasts.

The most significant conclusion of this line of action shall be provided by the comparison of the profitability figures obtained using the most efficient technology.

Given that the action of creating a Short Sea Shipping route acts as a catalyst that must cause a structural change within the current Turkish transportation market, the high frequency, freight forwarding charges and transit times required to compete with port-to-port transportation by road will make it difficult for the shipper offering services classified as Short Sea Shipping to run a profitable business.

It is for this reason that this initial profitability study shall have to be complemented with the tasks listed below, which are designed to investigate formulas that contribute towards ensuring the viability of the proposed Short Sea Shipping routes.

These tasks are the following:

1.1.1.5.1.- Analysis of possible actions within the port rates and fees regulatory framework with respect to the new proposed Short Sea Shipping routes

This means designing a rates and fees framework for the Short Sea Shipping routes that includes the specific peculiarities of each of these.

Using the support tool developed for the comparative profitability study, the different rates and fees scenarios shall be contrasted with a dual purpose in mind:

- to reduce the operating costs of the agent/s with the lowest profit margins,
- to not eat into the profitability of all the other agents.

However, the optimum conclusion scenario of this task shall not be sufficient to guarantee an acceptable profit margin for all the agents, particularly for the shipper, namely the private agent who must make the largest investment.

It is therefore necessary to perform the following task.

1.1.1.5.2.- Proposed financing formulas for the endowment of infrastructures and superstructures that make the creation of a Short Sea Shipping route possible.

Within the investment framework for the implementation of a Short Sea Shipping route it is necessary, at least initially, for the Administration to be the driving force behind it, to guarantee its viability and to eliminate any uncertainty regarding its sustainability over time.

There are two possible generic public support formulas:

- the granting of subsidies and
- the constitution of mixed public-private consortia that take on the responsibility for purchasing those infrastructural and/or super structural elements required to ensure the correct operation of a Short Sea Shipping route the acquisition of which cannot be undertaken by private agents, at least during the initial phase.

In both cases, the private agents meet the operating costs of the route.

The efficiency of the possible formulas for the Short Sea Shipping routes shall be evaluated as follows:

- On the one hand, with respect to the subsidies system, the size of a grant that guarantees the viability of the Short Sea Shipping route under study shall have to be determined.
- Given that the uncertainty in the forecasts is stochastically incorporated into the profit margins simulation tool, the aforementioned size of grant shall be determined using a stochastic optimiser, thereby obtaining not only an expected figure, but also a possible variation interval that establishes the subsidy between a minimum and a maximum.

On the other hand, as far as the alternative of a public-private consortium is concerned, the following shall have to be analysed:

The purpose and scope of activity of the consortium:

The purpose of the consortium shall be to purchase those infrastructural and/or super structural elements, including the procurement of vessels, required to ensure the correct operation of a Short Sea Shipping route the acquisition of which cannot be undertaken by private agents, at least during the initial phase.

A special case would be the financing of vessels given the fact that in order to guarantee a frequency of, for example 4 services per day (which would convert the route into a true motorway of the sea and represent a conceptual change in the way Short Sea Shipping is practiced in Turkey), the shipper shall have to acquire a far greater number of vessels than he really needs and shall have to manage extremely low vessel capacity usage rates, which is why it shall be essential that the elements required to operate the Short Sea Shipping route are purchased by all the members of the consortium.



The scope of action shall not, under any circumstances, include the operation of said elements by the public sector, with the cost thereof being met by the private investors at all times.

Composition, initial contributions and ownership structure:

Although the composition of the consortium should make the public participation clear on the one hand, on the other it should show the holdings of all those agents who are going to be involved in operating the Short Sea Shipping route as an expression of their commitment to making it a sustainable enterprise.

The ownership structure of the consortium must reflect the initial contributions of each party. The consortium would own the elements it acquires.

Distribution of profits–losses and regulation of the inter–party compensation options:

The use of the elements owned by the consortium by one of the agents shall imply that he must, on the one hand, meet all the operating costs of said element and, on the other, make a series of compensatory payments to the consortium for the use thereof.

The frequency and amount of these payments shall be one of the significant results of the analysis.

As a general criterion, these payments would only have to be made during the initial phase if the agent makes a profit and once a profit margin has been consolidated a complementary system for compensating the consortium would be applied in order to offset any payments pending from periods of losses.

On the other hand, the design of the compensations system and the determination of the likelihood that the consortium amortises the entirety of the initial investment made shall complement the conclusions of this point.

Regulation of the purchase–sale options:

The situation analysed in this point is that in which an agent who is using one of the elements owned by the consortium wishes, on reaching a certain level of profitability, to purchase said element from the consortium (purchase option) instead of having to make the compensation payments described in the previous section.

In order to regulate this situation it is necessary to establish not only the period during which the purchase option can be exercised, but also the procedure for determining the acquisition price.

Likewise, the symmetrical situation, in other words the scenario in which the consortium is entitled to sell an element, or a part thereof, to the agent who is using it, or even to a third party, shall be analysed.

This right of sale (be it total or partial) must be regulated in such a way so as to ensure that the exercise thereof does not, under any circumstances, result in the bankruptcy of the agent using the element and therefore undermine the operation of the Short Sea Shipping route.

The methodology to be used in this point to determine the prices of the aforementioned purchase and sale options shall be that based on the Real Options theory, which has already been applied in the evaluation of the flexibility of leasing contracts that contain similar purchase–sale options.

Regulation of the winding up of the consortium:

The winding up of the consortium within a profits consolidation scenario for the agents who operate the Short Sea Shipping route would be executed in a natural manner by way of the purchase–sale options described in the previous section.

Having said this, it is also necessary to establish a regulatory framework for the winding up of the consortium in the event of constant losses without any expectations of recovery (the failure of a Short Sea Shipping route project).



The agents would have to have the option of withdrawing from the business in the event of a highly negative scenario.

It is therefore necessary to establish the minimum level of continuous losses that would activate the right of withdrawal, as well as the rules governing the settlement of everything owned by the consortium.

In light of the fact that the infrastructural and super structural elements involved are of an extremely high inherent value, it is important to determine the settlement value thereof, information which each one of the agents shall include in his risk forecasts at the time of entering the project.

Plan 1.1.2: Improvements to intermodal maritime-railway operations.

As a key aspect, fomenting inter-modality at ports confronts the design of the rail terminals and their link-up to the general railway network.

Taking into account that rail traffic has to compete with road transport, the basic objective of the design of terminals and their links has to be that *the loading/offloading of goods on/off trains must not be more expensive or more complicated than the loading/offloading of goods on/off trucks* and, if possible, cheaper and more straightforward.

For this purpose, there are a number of important aspects to consider:

1. **The rail terminal has to be within and integrated into the marine terminal.**

In fact, even though the rail terminal may be relatively close to the marine terminal, if it is not within and integrated into it, in order to load a unit onto a rail car it will be necessary to load this unit first of all onto a truck, convey it to the rail terminal, unload it there, and then load it onto the train, so that we are adding a number of movements (costs and time) to what is actually truck loading. On the other hand, if the rail terminal is inside the marine terminal, the rail freight storage piles are merely additional piles at the actual marine terminal and the goods that are going to use this means of transport may be deposited directly on these piles by means of internal terminal movements.

In short, there may be integrated yard management encompassing both the "marine piles" and the "rail piles", all using the same machinery and the same handling system for this purpose. We thereby successfully make loading a rail car an equivalent operation (in time and cost) to loading a truck.

2. **The rail terminal has to be able to operate complete trains.**

Depending on the maximum train length permitted by the general rail network, it is extremely important to be able to operate the complete train at the port terminal.

Otherwise, having to divide a composition into various sections in order to be able to run them one by one into the port terminal, operate each section, and then carry out the operation in reverse so as to consolidate all the sections in a complete composition adds a cost and complexity to the rail operation, which makes it much less competitive.

3. **Costs of rail marshalling operations.**

Proximity of the rail terminal train receiving/dispatch marshalling yard boosts the efficacy of the operation.

The optimum solution would be to have an electrified marshalling yard just up line of the actual rail terminal.

In this case the costs of these handling operations could even be eliminated as the train driver himself would be able to position the composition at the rail terminal with no additional manoeuvres.

4. **Design of the actual rail terminal.**

The length of the tracks should allow complete trains to be operated.

The European standard is a length of 750 metres.

In addition, depending on the number of movements planned, there should be one loading track available per 25,000 annual movements.

As regards the machinery, up to two tracks may be operated with a reach stacker.
Operating with more than 2 tracks will require investing in gantry cranes.

5. **Availability of an integrated information system linked to all the agents.**

A critical aspect for efficient management of all these items of infrastructure. Prior to the arrival of vessels, it is important to know the type of goods transported by rail so as to be able to position them directly on the train loading piles and save intermediate movements that add costs.
In addition, it is necessary to match up the marine/rail terminal administrator computer system with the systems of the rail carriers so as to be able to coordinate and optimize handling manoeuvres and operations efficiently.

6. Lastly, since a minimum critical mass is required in order to optimize rail transport, if sea traffic provides these volumes by itself, then perfect. If this were not the case, a beneficial option would consist of taking advantage of continental traffics to add to sea traffics.

In short, *design a sea-land terminal*.

For this purpose, there are two important aspects to be considered: first of all, the availability of a land access to the rail terminal solely for continental traffic and, secondly, a customs handling procedure that does not penalize these movements.

For this second aspect, the European figure of an authorized economic operator for the sea-land terminal administrator may be the ideal solution.

This plan is implemented in the following courses of action:

1.1.2.1: Establishment of a Technical Commission for port-rail intermodality.

The aim of this commission will be to lay down a conceptual and technical framework for the design of rail terminals within ports and their link-up to the general rail network.

Members:

- a) Ministry of Transport, Maritime Affairs and Communications
- b) TCDD

Responsibility for coordination of this commission lies with the Ministry of Transport DG for Ports.

Activities assigned to the Technical Commission for Sea-Land Intermodality

These are as follows:

- Establishment of design criteria for rail terminals within marine terminals.
- Establishment of operating criteria for rail terminals at ports.
- Determination of standards to be met by operators for the design of terminals.
- Definition of basic rail equipment required for operation.
- Determination of functional capabilities to be covered by the information system for the operation of terminals.



1.1.2.2.: Fomenting of public-private dialogue.

The setting-up of networks between Government, industry, academic institutions and civil organizations is an essential part of an overview for combined sustainable load transportation.

For this purpose, workshops should be conducted with the sector stakeholders invited by the Technical Commission for port-rail intermodality in Turkey aimed at acting as a link for:

- ✓ generation of consensus with regard to the applicability of criteria.
- ✓ standardization of design parameters.
- ✓ consensus on operating capabilities of the support systems

OPERATIONAL OBJECTIVE 1.2. RAILWAY SECTOR.

JUSTIFICATION.

General overview of the proposed actions

The economic and demographic growth of the country, combined with the fact that a lot of the urban population is concentrated within its western third, mean that Turkey's transport system includes a number of unsustainable dynamics if the current split modal transportation framework is maintained with respect to the movement of overland freight.

The expansion and improvement of the road network, as well as the increase in the number of road transport vehicles and the accessibility of these to markets or production points to date almost exclusively served by rail, shall accentuate the imbalance of the modal overland freight transport distribution framework and be detrimental to the participation of the railways in the transportation of freight.

Operational objective 1.2 RAILWAY SECTOR includes the formulation of direct application actions aimed at improving combined rail-road freight transportation in light of current regulatory implementation with respect to rail and combined transportation.

All this means that not only the sectorial rules and regulations currently in force, but also the proposed sectorial rules and regulations under development, constitute a working premise. With respect to the sectorial rules and regulations currently in force, the starting point for this action plan is the framework provided by the "Bill on the Liberalisation of Railway Transportation of Turkey"(hereinafter referred to by its initials, B.L.R.T.T.).

As far as the proposed sectorial rules and regulations under development are concerned, the starting point for this action plan is the work carried out by Component 2 of the Spain-Turkey Twinning, "Strengthening Combined Transport in Turkey" Project, The Proposal Regulation on Combined Transport.

The fact that the rail freight corridors channel not only provides unimodal transportation services, that is those involving the goods in question being moved exclusive by rail, but also combined transportation services, which include the participation of both rail and road transportation, means that a basic working premise must be that the viability of the combined transportation services offering has, by default, to involve the implementation of actions aimed at ensuring the efficiency of the rail transportation services provided in the rail freight corridors, because without the implementation of a competitive rail freight offering all the efforts being made to establish a combined rail-road transportation offering shall be rendered useless.

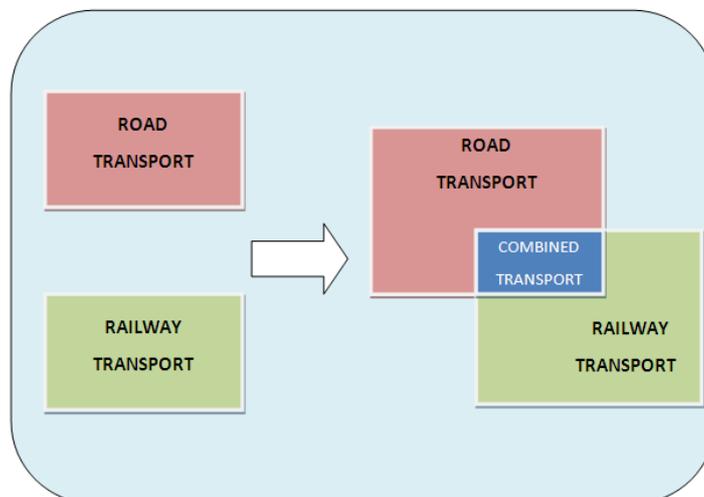


Image 7: Combined land transport



In accordance with this basic working premise, the actions to be implemented must, at all costs, be aimed at redirecting the investment and planning efforts being made towards a core-network of rail corridors developed in accordance with the flows of freight suitable for transportation by rail (the train-friendly freight concept), hence having to justify the need to define an **objective framework of rail freight corridors**.

The integral nature of this operational objective determines that actions or measures must be implemented that are not only aimed at increasing the capacity of the railway infrastructure or connectivity on offer, but also at implementing actions that ensure a reorientation of the rail transportation service offering towards market and customer needs.

International experience clearly points out that the changeover from a monopoly situation, namely railway operation services being provided by a public or state carrier, to an open market situation with respect to the provision of rail transportation services, implies entering into medium- or long-term scenarios (5-10 years) as regards the private sector being able to provide a rail freight transportation service offering that has both sufficient capacity and is competitive.

This means that The General Directorate of Turkish State Railways Administration (TCDD) and the Turkish Railway Transportation Corporation (DETAS - *Demiryolu Taşımacılığı Anonim Şirketi*) shall have to be both on the receiving end of the actions and key players with respect to the planning and implementing the activities decided upon within this operational objective due to the fact that they are, to a great extent, responsible for launching or ramping up an offering of basic efficient and competitive railway transportation services that will contribute towards any initiative aimed at improving the combined transportation of freight and making it more dynamic.

The coordinates introduced in this Operational Objective with respect to the railway transportation operation and services are:

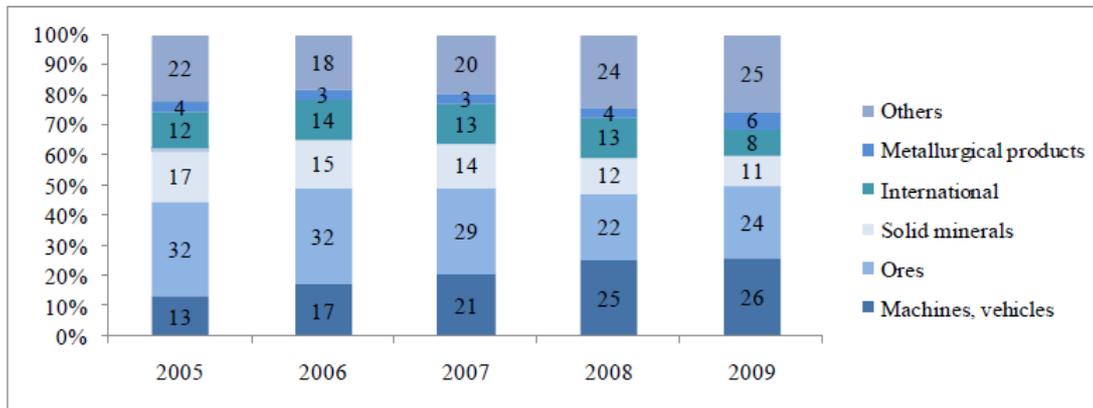
- to provide a railway transportation service that is better adjusted to the requirements and variations of market demands.
- to provide a more competitive service capable of achieving the potential market shares allocated and make its transportation offering economically viable.
- to simplify the transportation offering, the derived processes and the pricing or fee concepts.
- to enable the incorporation of the railway transportation offering into integral logistics offerings within domestic or international logistical chains.
- to resolve the main bottlenecks: Marmaray, integration with the European railway network and upgrading of the traffic management and circulation structures.

The necessary adaptation to market demands implies abandoning a vertical integration organisational framework based on administrative criteria and regional establishments and moving on to the development of a horizontal organisational framework specialised in sectors or product types that enable demand to be met and the creation of transportation offerings in accordance with customer needs.

The **organisation of the public railway operator** must be carried out in accordance with horizontal organisational criteria based on by sector specialisation via the formation of **business units** which, in an independent yet coordinated manner, define objectives, allocate resources, develop their own business plan and commercial strategy and establish their own pricing framework.

The business units must be the necessary step prior to studying, where appropriate, a subsequent corporate individualisation thereof, thereby forming the perfect tool for the participation in public-private projects within the combined transportation sector and integration into integral logistics offerings.

The following image shows freight traffic broken down by category compiled by the TCDD for the years 2005-2009: the composition of the TCDD freight traffic provides an initial framework for a possible splitting up of the freight division of the Turkish Railway Transportation Corporation (DETAS) into business units.



Note: Freight traffic by type of commodity, measured in net ton-km.
 Source: T.C. Devlet Demiryollari Istatistik Yilligi (2010).

Graph 10: Types of freight moved by TCDD broken down by category

The corporate objective of the public railway operator (DETAS) must be the sale of a transportation service that is adapted to the needs of the market via products that are both extremely well defined and profitable.

Following along these lines, an essential requirement shall be to study the viability of each service offered. This will enable the rail freight transportation services to be tendered while knowing the real costs thereof, thereby ensuring profitability.

In the assumption that the rail freight transportation service is not a public transport service, it shall have to be supply and demand that determine whether a rail transportation service is viable or not given that it is provided on an economic basis, in other words, by charging for costs and trading margin.

Having carried out the viability study with respect to the services offered, it shall have to be each business unit that determines whether or not one of the following strategies must be followed:

- rearrangement of resources (lowering of capacity or allocation of other capacities),
- prioritisation (increase of capacity or allocation of other capacities) or
- withdrawal of rail freight transportation services.

With respect to the withdrawal of rail freight transportation services, a commercial effort must be made to try and maintain the service, but only if its profitability is ensured.

In order to do so, meetings must be held with the customer/s and with the operator prior to proceeding to close down the line or service, and solutions must be sought that do not push the customer/s away from rail transportation on a permanent basis.

Likewise, if the strategy involves increasing the prices of the services offered, entering into dialogue and looking for solutions form a fundamental part of ensuring that the customer to whom the service is currently being provided is not lost forever.

One possible solution is that of offering the customer who might potentially be lost due to the withdrawal of a rail freight transportation service the opportunity of becoming a combined transportation operator or contracting a combined transportation service.

For example, let us imagine that a rail freight transportation service is currently being provided between Diyarbakier and Malatya, that it is losing money, and that the operator has decided to withdraw it.



As the final destination of the freight in question is Samsun, the commercial strategy would involve offering to cover the stretch between Diyarbakir and Malatya by road and taking the freight the rest of the way, namely from Diyarbakir to Samsun, by train.

In short, the withdrawal of rail freight transportation services must be a last resort and only implemented after all the avenues promoting loyalty and ensuring that customers are not driven away from the railways have been explored.

With respect to evaluating the capacity of the rail freight infrastructure required to meet the modal share objectives allocated, noteworthy elements such as those listed below must be assimilated:

1.- The opening of high-performance railway corridors for the operation of high-speed passenger rail transportation services.

The opening of these high-speed corridors results can have either a negative effect (threat) or a positive effect (opportunity) with respect to the capacity of the rail freight infrastructure.

Threat: International experience shows that the introduction of these high-speed services brings with it a rearrangement of the passenger services offering characterised by the withdrawal of passenger services on conventional lines shared by passengers and freight.

This withdrawal of passenger services on the conventional lines makes it more difficult to economically sustain their infrastructures, which are now almost exclusively reserved for short-distance passenger and freight services.

Opportunity: At the same time it means a freeing up of conventional line capacity, thereby making it easier to run freight trains, which have always played a secondary role with respect to passenger traffic.

2.- The recent entry into effect of the Bill on THE LIBERALISATION OF RAILWAY TRANSPORTATION OF TURKEY is going to prevent the incorporation of the possible private sector or public-private sector rail freight infrastructures development initiatives into the rail freight infrastructure capacity evaluation as a result of the framework of possibility provided by the new regulatory framework.

What is needed is the incorporation of a capacity evaluation framework based on possible private initiative and execution scenarios with respect to rail freight transportation infrastructure.

3.- The action to be carried out consists of evaluating the real capacity of the railway infrastructures (lines and terminals).

This is not only a matter of enumerating or taking stock of the rail infrastructure. It is a case of determining, with respect to the railway lines, whether or not the current condition of the infrastructure (characteristics and maintenance) and the management thereof (circulation channel allocation criteria, among others) enables the provision of competitive rail freight transportation services.

Likewise, with respect to the nodal loading/unloading points or Terminals, it is a matter of determining their true capacity for managing the target traffic flows in terms of design, location, accessibility and equipment endowment.

4.- The capacity of the infrastructure is determined not only by whether or not it is physically capable of handling competitive traffic flows. Whatever the case, its capacity shall depend on its ability to manage operational traffic, in other words on its integrated information systems.

The delay and cancellation ratios of train services are a fundamental reference of this operational management capacity.



Therefore, the capacity of the infrastructure must be understood as its physical capacity (physical offering stock) and its information management capacity (IT systems, control systems and the levels to which its staff have been trained).

5.- The configuration of corridors at the infrastructure, lines and Terminals level implies that whenever several alternatives exist, the suitability criteria with respect to rail freight traffic is based on parameters such as maximum gradients, permitted train-lengths, axle-loads and loading gauges.

The planning process with respect to the rail freight infrastructures in Turkey and the freight transportation system in general is faced with two fundamental and strategic challenges by which the planning efforts being developed as regards the country's freight transportation network can be judged as being a success or a failure:

6.- The Marmaray Tunnel and the European Rail Freight Corridors Network.

Every effort must be made to ensure the unification of the Turkish rail network (which is currently made up of two independent railway networks: Thrace and Anatolia), and then the integration of this with the European Rail Freight Corridors.

Also, the efficiency of the combined overland rail-road transportation offering depends on the efficiency of the overland Intermodality points (Combined Transportation Terminals and Logistical Platforms) and on the collaboration with the road.

Although it is generally admitted that Combined Transportation is made up of the strong points of the different modes, thereby paving the way for a significant potential solution of some of the problems and inefficiencies that currently dog the global transportation system, reality does, however, show that certain threats or weaknesses of the combined offering limit its results.

The viability of a combined overland rail - road transportation offering as a means of bringing together different means of transport depends on the availability of the following tools:

- A rail transportation offering adapted to the needs of the customer. It must be reliable and competitive in order to ensure the overall viability of the combined transportation offering.
- An offering of specialised overland Intermodality nodes that are well located, feature the required capacity, efficient design and operability that act as the interface between the rail and road transportation networks.
- A road transportation offering at the service of the combined transportation network with specialised equipment and operational features.

Given that the overland Intermodality node is an interface between different modes of transport, its characteristics, operational capacity and location shall be determined by the specific features of the rail transportation offering and by the road transportation offering specialised in combined transportation.

In this respect it is worth pointing out that the road transportation offering that specialises in combined transportation has organisational peculiarities which affect the provision of resources and, consequently, investment, as well as problems not habitually found in the general road freight transportation sector.

The characterisation of a freight transportation corridor as a line connecting two nodes does not mean that it connects two sites or logistical locations.

In the majority of cases these lines connect a variety of logistical or production sites whose forwarding and reception processes go to make up a combined transportation corridor.



Consequently, the efforts being made to include the railway must focus upon the internodal connection phase of the transportation process.

The transportation processes generated within the interior spatial scope that end up either at the node (storage for distribution and capillary distribution – cross docking operations –) and within its immediate proximity (regional scope) are not a priority for the rail freight transportation service.

A priority for the railway and, therefore, for the combined transportation process, shall be the availability of a network of logistics centres with rail access (Freight Villages) and access to a network of combined freight terminals, thereby enabling the flows of freight to be concentrated before being channelled towards the internodal rail connection, in other words the rail corridor.

There must be a degree of parallelism and coordinated action when it comes to planning the intermodal and rail capacity with respect to the action implemented in the two nodes that make up the corridor. In the absence of this parallelism and coordinated action it is highly likely that serious bottlenecks shall occur that affect both nodes and invalidate the entire action plan.

This need for parallelism in the capacity of the nodes for the management of rail traffic flows is always essential, particularly so in the case of Turkey and within the scope of the port-rail corridors on which the Combined Freight Terminals located in ports strategy, planning and development that makes up the Proposal Regulation on Combined Transport is based, and which remains outside the scope of competence scheduled for the Ministry of Transport, Maritime Affairs and Communications.

The upshot of the above is that **the action of designing a nodal strategy becomes a priority for promoting combined transportation within the rail corridors:** action based on the coordination of the scopes of competence, the actions and developments with respect to intermodal and railway infrastructures, on the nodes of the different corridors and, specifically, given the competition situation and the different port ownership criteria, on the scope of those corridors starting or ending at a sea port.

ACTION PLANS OF OPERATIONAL OBJECTIVE 1.2.

The action plan of operational objective 1.2 breaks down as follows:

1.2.1.- Rail freight corridors

1.2.2.- Overland Intermodality.

OPERATIONAL OBJECTIVE	PLAN OF ACTION	LINES OF ACTION	ACTIVITY
1.2. RAIL SECTOR	1.2.1. Rail Freight corridors	1.2.1.1 Definition of a target framework for rail freight corridors.	
		1.2.1.2 Strategic reorientation of Turkish Railway Transportation Corporation (Freight)	1.2.1.2.1. Development of a horizontal organization structure based on independent business units. 1.2.1.2.2. Study of feasibility of services tendered: Re-organization, prioritization and cancellation of transport services
		1.2.1.3 Interoperability and integration of Turkish rail networks	1.2.1.3.1. The Marmaray Tunnel. 1.2.1.3.2. Integration of Turkish rail freight transportation into the European Rail Freight Corridors Network. 1.2.1.3.3. External audit of the traffic and safety management systems in the Turkish rail network.
	1.2.2. Land Intermodality	1.2.2.1 Plan for improvement of rail accessibility at production and logistics facilities in Turkey	
		1.2.2.2 Definition of a nodal strategy	
		1.2.2.3 New framework of operation at TCDD-owned Combined Freight Terminals	1.2.2.3.1. Functional separation between infrastructure and operation 1.2.2.3.2. Singularize and disaggregate economic operation by rail facilities 1.2.2.3.3. Management, fare-setting and commercial independence

Table 2: Action plans and lines for Operational Objective 1.2

Plan 1.2.1. Rail freight corridors.

This Plan is built around the following lines of action.

1.2.1.1. Definition of a rail freight corridor objective framework.

This consists of determining the forecast demand of freight flows suitable to be carried by train (the potential market for the rail freight transportation sector) in accordance with the following coordinates:

- The type of freight.
- The despatch batch.
- The concentration of flows.
- The transportation cost and time.
- Other requirements. The sources and destinations of the freight in relation with the railway network.

Once the forecast or potential demand has been determined, the next step shall be to determine the modal share objective and thus draw up an **objective map of rail freight corridors in Turkey** expressed in net tonnes transported or other standardised statistical measurement.

The railway mode share objective shall be compiled as per corridors and freight groups in such a way that this railway mode share objective shall have to contradict the current and forecast railway offering both with respect to infrastructural capacity and operational capacity, in other words as regards rail transportation offering.



The objective map of rail corridors shall, insofar as it contradicts both current and forecast railway capacity, enable the determination of investment priorities and reallocation of capacities, not only of circulation routes (in many cases the circulation of freight is conditioned by and subordinate to the transit of passengers, especially on shared railway lines within metropolitan rings and in the accesses to the large cities), but also of railway transportation equipment capacity (locomotives and wagons).

Expected results:

The objective map of rail corridors shall, in accordance with the traffic density and the capacity of absorption of the installed capacity, serve as an investment planning and prioritisation tool. In accordance with the data it provides, it is recommendable to incorporate a priority gradient in line with the traffic density determined. The priority gradient would also determine the allocation of resources and the temporary action criterion.

Action implementation framework:

1. Characterisation of the potential railway market.
Update of the freight transportation flow studies by corridor and potential rail usage sectors.
2. Determination of the railway mode share by corridor and freight group.
Installed capacity of the railway offering.
Evaluate the current and future capacities of the rail freight infrastructure as they relate to the investments forecast to be made: railway infrastructure and railway transportation equipment offering (machinery pool and staff).
3. Readjustment of the railway mode share objective in accordance with the contradictory study of installed capacity.
4. Determination of the degree of priority of the corridors in accordance with:
 - a) traffic density and potential traffic capture criteria.
 - b) extra-territorial connectivity and accessibility to customer markets.
 - c) profitability.
5. Inverse planning.
This represents the planning of the investments in infrastructure and equipment in accordance with the priority criteria determined previously and which enable the fixed mode share objectives to be met.

These serve as criteria for the arrangement, reallocation and adjustment of resources, as well as for making use of the existing infrastructure. Inverse planning is reoriented to a core network.

Expected results:

The objective map of rail corridors shall, in accordance with the traffic density and the capacity of absorption of the installed capacity, serve as an investment planning and prioritisation tool.

In accordance with the data it provides, it is recommendable to incorporate a priority gradient in line with the traffic density determined.

The priority gradient would also determine the allocation of resources and the temporary action criterion.

1.2.1.2. Strategic reorientation of the Turkish Railway Transportation Corporation (Freight).

In accordance with the following graphic:

Strategic Actions to be performed by Turkish Railway Transportation Corporation (DETAS)

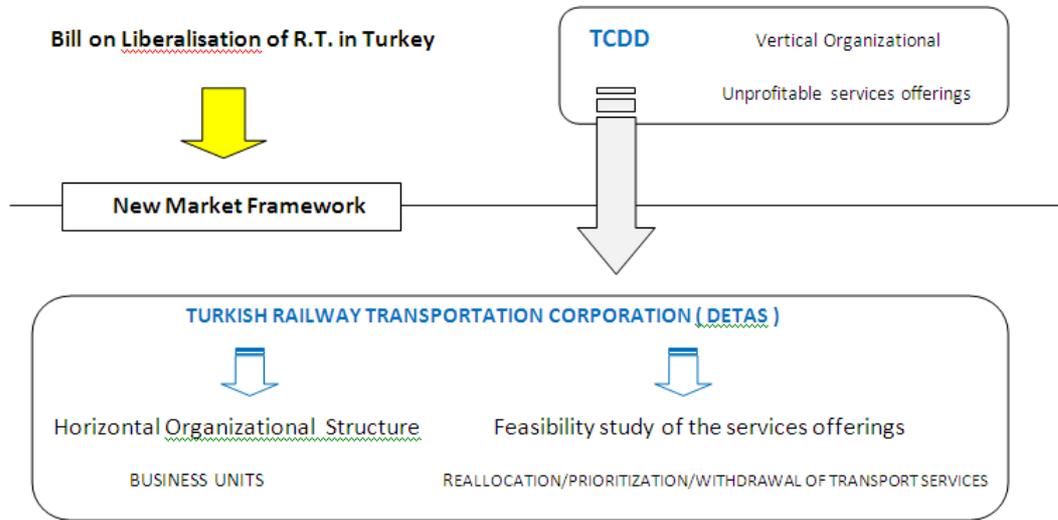


Image 8: Strategic actions to be implemented by DETAS

The public rail undertaking, the Turkish Railway Transportation Corporation (DETAS), defines and executes a strategy based on two principal actions:

1.2.1.2.1. The development of a horizontal organisational structure based on Independent Business Groups.

Within its freight division the Turkish Railway Transportation Corporation (DETAS) establishes a horizontal organisational structure based on independent business units set up either by sector or load type.

Independently, although coordinated by the freight division's senior management team, the business units define objectives, procure resources, develop their business plans and their commercial strategy and establish their tariff or pricing framework.

The possible actions open to the business units within the combined transportation framework are:

- The business units establish functional agreements with road transportation operators in order to arrange joint combined transportation offerings.
- The business units offer combined transportation services based on the contracting of road transportation services.
- As part of a second, strategic reorientation phase the business units set they up as trading companies and work alongside other private companies in combined transportation and/or integral logistics projects.

See Annex 3. Presentation of the Spanish Model: One way of revitalising the rail freight transportation sector.

1.2.1.2.2. Viability study of the services offered: Reallocation, prioritisation and withdrawal of transportation services.

The corporate objective of the public railway operator must be that of selling a profitable transportation service that is adapted to the needs of the market via an extremely well defined range of products.

Following along these lines, an essential requirement shall be to study the viability of each service offered.

This will enable the rail freight transportation services to be tendered while knowing the real costs thereof, thereby ensuring profitability.

Once the viability study with respect to the services being offered has been carried out, it shall have to be each of the business units, within the framework of the freight division, that decides whether one or more of the following strategies must be followed: rearrangement of resources (withdrawal of capacity or allocation of other capacities), prioritisation (increase of capacity or allocation of other capacities) or withdrawal of transportation services.

With respect to the suppression of rail freight transportation services, a commercial effort must be made to try and maintain the service, but only if its profitability is ensured.

In order to do so, meetings must be held with the customer/s and with the operator prior to proceeding to close down a line or withdrawing a service, and solutions must be sought that do not push the customer/s away from rail transportation on a permanent basis.

Likewise, if the strategy involves increasing the prices of the services offered, entering into dialogue and looking for solutions form a fundamental part of ensuring that the customer to whom the service is currently being provided is not lost forever.

1.2.1.3. Interoperability and integration of Turkey's railway networks.

This line of action involves three principal activities aimed at ensuring the interoperability and integration of the railway networks in Turkey.

1.2.1.3.1. The Marmaray Tunnel.

The purpose of this activity is that of ensuring rail freight transportation services (European standard) have full access to the tunnel and of developing the full potential of the project to integrate Turkey's rail freight networks (Thrace and Anatolia).



Image 9: The Marmaray Tunnel

In order to achieve this, the plan is to set up a Commission for rail freight accessibility to the Marmaray Tunnel, which would be chaired by the Transport Minister and include the presence of the Marmaray Tunnel's Administrator, DGCTR, DETAS, the Directorate of Turkish State Railways



Administration (TCDD) and the Municipal Council of Istanbul, and to create a series of technical round tables, which will include, for example:

- The design of the infrastructure and superstructure for the operation of rail freight transportation services. Limitations. Needs.
- Traffic management and circulation route allocation criteria. The integration of circulation systems: railway network (Thrace and Anatolia) and Marmaray Tunnel infrastructure.
- Tunnel safety criteria (transportation circulation compositions by type of traffic and traction (locomotives), Dangerous Goods).
- The integration of networks and connection infrastructure needs (terminals, hangars, sidings, classification and maintenance centres).
- Maintenance plan and economic framework for its implementation.
- Tariff plan and economic-financial frameworks for the provision of railway network connection infrastructure.

1.2.1.3.2. Integration of Turkey's rail freight transportation service into The European Rail Freight Corridors Network.

The European Union has defined 9 international rail freight transportation corridors within the European railway network, with these carrying 80% of freight moved every year.

For Turkey, this initiative represents a great strategic opportunity for connecting the country, which lies on the periphery of the European mainland, with its principal market.

The establishment of standardised and simplified criteria throughout the entire Rail Freight Corridors Network will enable, once the parameters established are in place, Turkey's rail undertaking to both access and use this large capacity freight rail network, albeit on the necessary give-and-take basis.

The DGCTR, together with the Directorate of Turkish State Railways Administration and the corresponding general directorate within the Ministry for Foreign Affairs (the body that liaises with the EU), shall set up an **Inter-ministerial Commission**, which shall define the future strategy for the connection of Turkey's rail freight transportation system and presenting it before the European Commission.

The establishment of a route map, which shall enable Turkey to move forward, in parallel with the European countries, with respect to overcoming the operational, infrastructural, governance structure and traffic management challenges it faces.

In order to achieve this, the DCTR, in conjunction with the Directorate of Turkish State Railways Administration and DETAS, shall determine the action plans that enable Turkey's rail freight corridors and the way they are managed and operated to be brought into line with the European guidelines that govern the European corridor.

The line of action that Turkey needs to implement in order to participate in the European Rail Freight Corridors Network projects **require the following parameters to be addressed:**

1. **Reliability** of railroad service offered by infrastructure managers, terminal operators and railway undertakings.
2. **Supply of international paths** for freight trains both during the day and at night along the corridor.
3. **Information** about the traffic situation along the corridor, especially in case of interruptions to services.
4. **Cost of transport**, including railway infrastructure fee.
5. **Time of transport**, including change of locomotive and/or mechanical maintenance required by Railway undertakings.
6. **Freight train speed** in relation with length and load.

7. Time needed for freight train transfer at frontier, including the documentation of train's load composition.

The players involved in the establishment of the European Rail Freight Corridors Network have set themselves three challenges:

1. Strengthening co-operation between Infrastructure Managers on key aspects such as allocation of path, deployment of interoperable systems and infrastructure development;
2. -Striking the right balance between freight and passenger traffic along the Rail Freight Corridors, giving adequate capacity and priority for freight in line with market needs and ensuring that common punctuality targets for freight trains are met;
3. -Promoting intermodality between rail and other transport modes by integrating terminals into the corridor management and development.

1.2.1.3.3. External audit of the Turkish railway networks' traffic and safety management systems.

The objectives of this action are:

- To bring Turkey's traffic and safety management systems into line with the most stringent current standards.
- To determine the deficiencies of the rail traffic and safety management process and incorporate the improvements required to rectify them.
- To install integrated management systems which improve the efficiency and safety of train traffic by carrying out works or maintenance on the infrastructure.
- To allocate resources, procedures and new technologies to those centres responsible for the management of rail traffic.
- To establish continuous improvement procedures with respect to the quality of the rail transportation service (resulting in fewer delays, cancellations and accidents).



Image 10: Control room

It is recommended that the contracting of this external audit be carried out by the Directorate of Turkish State Railways Administration.

The audit management team shall be made up of technicians working for the Directorate of Turkish State Railways Administration and the DGCTR, with both directorates combining to provide a joint audit statement and a list of the required corrections or implementations that need to be introduced.

Plan 1.2.2. Overland Intermodality.

This Plan is built around the following lines of action.

1.2.2.1. Railway accessibility improvement plan in production and logistics facilities.

The process of improving rail freight transportation in Turkey must include providing the country's principal production and logistics facilities with access to the railway system.

The provision of rail access to these production and logistic facilities shall, in some cases, be achieved using interior or close proximity (siding track) railway infrastructure and, in other cases, by way of Combined Freight Terminals or Dedicated Freight Terminals.

This line of action is subordinate to and forms part of Operational Objective 2.2., Turkish Logistics Master Plan, action plan 2.2.4, Logistical Map of Turkey.

The drawing up of a logistical map of Turkey is a necessary process as it will form the perfect basic tool for implementing action measures aimed at improving the rail access of the country's principal production and logistics facilities.

The development of a logistical map will enable the interested parties to familiarise themselves with the rail connectivity, flows, load types and location of Turkey's principal production and logistics facilities.

The drawing up of a logistical map of Turkey will also establish design guidelines with respect to a nodal strategy based on intermediate nodes that are potentially capable of decongesting the network and providing fluidity to the principal nodes with important synergies for the location of production and logistics activities.

Consequently, the logistical map of Turkey becomes a tool for improving rail accessibility and, by default, raising the volume of rail freight transportation, and for forming the base for proactive business and follow-up activities.

In accordance with the foregoing, the need arises to incorporate the study of the rail accessibility of the country's productive and logistics facilities into the requirements of the process of drawing up the logistical map of Turkey.

The study of rail accessibility engendered by the logistical map of Turkey shall be the tool to be used for promoting the provision of new or the improvement of existing connective rail infrastructure or for implementing a combined transportation offering to meet transport demands.

In order to meet this need, the DGCTR assumes responsibility for incorporating a rail accessibility study with respect the country's principal production and logistics facilities into the process of drawing up the logistical map of Turkey.

In accordance with the definitive results regarding access to the railway network of the country's current productive and logistics facilities, the DGCTR shall develop an action plan, agreed by consensus with the private sector, designed to tackle the lack of rail connectivity or the absence of rail or combined transportation offerings with respect to Turkey's principal production and logistics facilities.

The DGCTR shall draw up an initial action plan, which shall be submitted to the Turkish Railway Transportation Corporation (DETAS) for the latter to carry out a feasibility study.

Once DETAS has confirmed the feasibility of the initial action plan, the DGCTR shall proceed as follows:

- ✓ Planning of the state investment initiatives required to provide new or improve existing connective rail infrastructure.
- ✓ Negotiation of public-private agreements regarding the provision of new or improvement of existing connective rail infrastructure.
- ✓ Designing a combined transportation services offering to cover the rail accessibility gap.

The organisational chart of the DGCTR is rounded off with the creation of a Sub-directorate that shall focus its activity exclusively on the rail connectivity between Turkey's port facilities and her inland logistics nodes and Combined Freight Terminals.

1.2.2.2. Definition of a nodal strategy.

The Proposal Regulation on Combined Transport drawn up by Component 2 includes the following definition:

"A Combined Freight Terminal means a place where the interface of goods occurs between two or more modes of transport and where there is a process of planning, implementing and controlling the efficient, effective flow and storage of goods".

Whereas the most basic type of combined rail-road transportation chain, namely that which runs between two points, source and destination, without load breakdown and in which at least two modes of transport participate, the Combined Freight Terminal performs a clear function as a regulatory node of the combined transportation corridor by providing a seamless connection or interface between the road and rail transportation systems.

Within the combined transportation chain the most basic type of **Combined Freight Terminal** would be a place where combined transportation unit exchanges occur between the rail and road modes without the need for load breakdowns that interrupt the transportation flow.

This definition is based on the fact that the Combined Freight Terminal acts as a rail-road connection node, which does not require loads to be broken down. This is due to the unitised transfer process, in other words loads remain within combined transportation units. This does not imply that the Combined Freight Terminal's services do not include the breaking down of loads for load deconsolidation/consolidation and subsequent rail or road transportation.

There must be a degree of parallelism and coordinated action when it comes to planning the combined and rail capacity with respect to the action implemented in the two nodes that make up the corridor. In the absence of this parallelism and coordinated action it is highly likely that serious bottlenecks shall occur that affect both nodes and invalidate the entire action plan.

This need for parallelism in the capacity of the nodes for the management of rail traffic flows is always essential, particularly so in the case of Turkey and within the scope of the port-rail corridors on which the Combined Freight Terminals located in ports strategy, planning and development that makes up the Proposal Regulation on Combined Transport is based, and which remains outside the scope of competence scheduled for the Ministry of Transport, Maritime Affairs and Communications.

The upshot of the above is that the action of designing a nodal strategy becomes a priority for promoting combined transportation within the rail corridors: action based on the coordination of the scopes of competence, the actions and developments with respect to combined and railway infrastructures, on the nodes of the different corridors and, specifically, given the competition situation and the different port ownership criteria, on the scope of those corridors starting or ending at a sea port.

The nodal strategy consists of the following actions:

- ✓ Node selection.
- ✓ Study of nodes by way of the definition of node, extra-node and inter-node circuit types: load type, times and logistical phase.
- ✓ Determination of the sufficiency and validity of the capacity installed in the nodes (characterisation of the infrastructure, location) both in terms of rail freight terminals and the connectivity between logistical platforms and the railway network.
- ✓ Public-private coordination and negotiation for:
 - The dismantling of current railway infrastructures (terminals and lines).
 - New railway infrastructure projects (terminals and lines).

The DGCTR, in coordination with the Directorate of Turkish State Railways Administration (TCDD), shall study the suitability of the locations proposed for Combined Freight Terminals suggested by the TCDD and based on the logistical map drawn up with respect to the nodes.

Based on the study carried out the proposed location shall either be approved or actions to relocate it shall be set in motion.

This work shall be undertaken based on three assumptions, namely:

- ✓ That **priority shall be given to maintaining and improving existing infrastructures** rather than to the creation of new ones.
- ✓ That **the duplication of infrastructures shall be avoided** within the same corridor or relationship. New infrastructure shall only be approved if optimum use is being made of its existing counterparts.
- ✓ The **collaboration and participation of the private sector and local administrations** shall be promoted.

With respect to this line of action it is recommended that the DGCTR takes the role of one-stop window at Ministry of Transport, Maritime Affairs and Communications level for the processing of the railway connectivity implementation requests filed by the private developers (including the Port Operators Association of Turkey, TURKLIM).

The DGCTR shall work in close collaboration with employer-related institutions (chambers of commerce and associations linked with the transportation and logistics sector) in order to promote Intermodality within the traffic routing decision making process.

The inherent nature of sea ports as a load concentration points (whether unitised or not) determines their inclusion as a priority objective with respect to combined transportation (containers) and rail freight transportation (bulk liquids or solids, other non-unitised loads, vehicles).

Given the importance of the role played by the sea ports in the combined transportation process and vice versa, it is necessary for the DGCTR to act as the coordinator between the sea ports and the inland combined infrastructure allocation initiatives (Dryports and Combined Freight Terminals).

It is proposed that the organisational chart of the DGCTR be created with the creation of a Sub-directorate that focuses its activities exclusively on the combined transportation dryport corridors.



1.2.2.3. New operational framework in the Combined Freight Terminals owned by the General Directorate of Turkish State Railways Administration (TCDD).

This line of action shall concentrate on defining operational development plans designed to make the Combined Transportation Terminals owned by the TCDD more efficient.

This means that these operational development plans are prepared on behalf of the General Directorate of Turkish State Railways Administration (TCDD).

1.2.2.3.1. Functional separation between infrastructure and operation.

The functional separation between infrastructure and operation is fundamental for introducing private management into the Combined Freight Terminals on the understanding that this is necessary to provide the flexibility, availability and efficiency required by the logistical network of which they form part.

The incorporation of private management into the TCDD'S Combined Freight Terminals can be achieved in different ways:

- ✓ By maintaining the public ownership of the infrastructure and putting the integral management of the facility out to tender.
- ✓ By the private initiative having a holding in the ownership of the infrastructure and the operation thereof.
- ✓ By collaboration between the public and private sectors following the constitution of companies with assets demarcated by the infrastructure of the Terminal (the TCDD shall draw up land transfer deeds for the recently founded companies).

Disposal (sale) of the Terminals, within a pre-established framework encompassing business plan, continuity in service, investments, traffic commitments and public service reserves, which result in real estate and non-speculative stakeholder interests (principally land).

The move from temporary transition to the final separation between infrastructure and operation would be the indirect management of the TCDD Combined Freight Terminals de TCDD by an independent business unit that reports to the freight division of the Turkish Railway Transportation Corporation (DETAS) created ad-hoc, namely: The Terminals Operation Business Unit.

The Terminals business unit of the Turkish Railway Transportation Corporation (DETAS) would be an independent business unit with its own professional workforce and resources that would enable the Turkish Railway Transportation Corporation (DETAS) to respond to any subsequent bids for tender regarding the integral management of the Terminals in partnership with private operators and also to participate in the concession, public-private partnership or disposal of the Combined Freight Terminals.

Direct management by TCDD must be discounted.

1.2.2.3.2. Singularise and break down the economic operation by railway facilities.

Singularise the economic operation by Terminal, in other words every Terminal is answerable for its profit and loss account.

This involves the incorporation of efficiency and self-management criteria.

The General Directorate of Turkish State Railways Administration (TCDD), owner of the railway infrastructures under public ownership, shall proceed to constitute a General Sub-directorate (General Sub-directorate of Terminals), the immediate functions of which shall include:

- ✓ Compiling an inventory of the railway infrastructures.
- ✓ Determine their capacity for supporting combined transportation operations.
- ✓ Delimiting, with respect to each railway facility, the infrastructural elements such as surface areas, installations and equipment that makes up a Combined Freight Terminal.
- ✓ Developing an analytical accounting process to compute the costs of each Combined Freight Terminal in accordance with the assignment of allocated assets.
- ✓ Configuring a singularised profit and loss account for each Combined Freight Terminal identified.
- ✓ Defining the assignment criteria of financial liabilities.
- ✓ Defining the assignment criteria of personnel.
- ✓ Once the publically owned Combined Freight Terminals have been singularised, the TCDD'S General Sub-direction of Terminals shall assume the joint management of all the Combined Freight Terminals, which includes determining their business models.

1.2.2.3.3. Management, fee charging and commercial independence.

Each Combined Freight Terminal shall have managerial autonomy within the business model defined by the TCDD'S General Sub-direction of Combined Terminals.

The Combined Freight Terminal shall prepare their service offerings in accordance with the demands of their customers. All the Combined Freight Terminals shall have to tender within a framework of minimum common services that define their operational characterisation as Combined Freight Terminals: rail capacity and intermodal capacity.

The secondary services that complement the principal ones (minimum common services) shall be tendered and, consequently, shall be defined and allocated resources if and when a market demand exists that makes them profitable.

Any non-profitable complementary services shall be withdrawn in all the Combined Freight Terminals as the services provided shall, at the very least, have to cover their costs.

Each Combined Freight Terminal shall establish its own fee or pricing framework with respect to its services offering, with this being done in accordance with market and profitability criteria.

In its business model the Combined Freight Terminal shall define the fee structure of its services in accordance with its costs and its capacity to pass these on to the market.

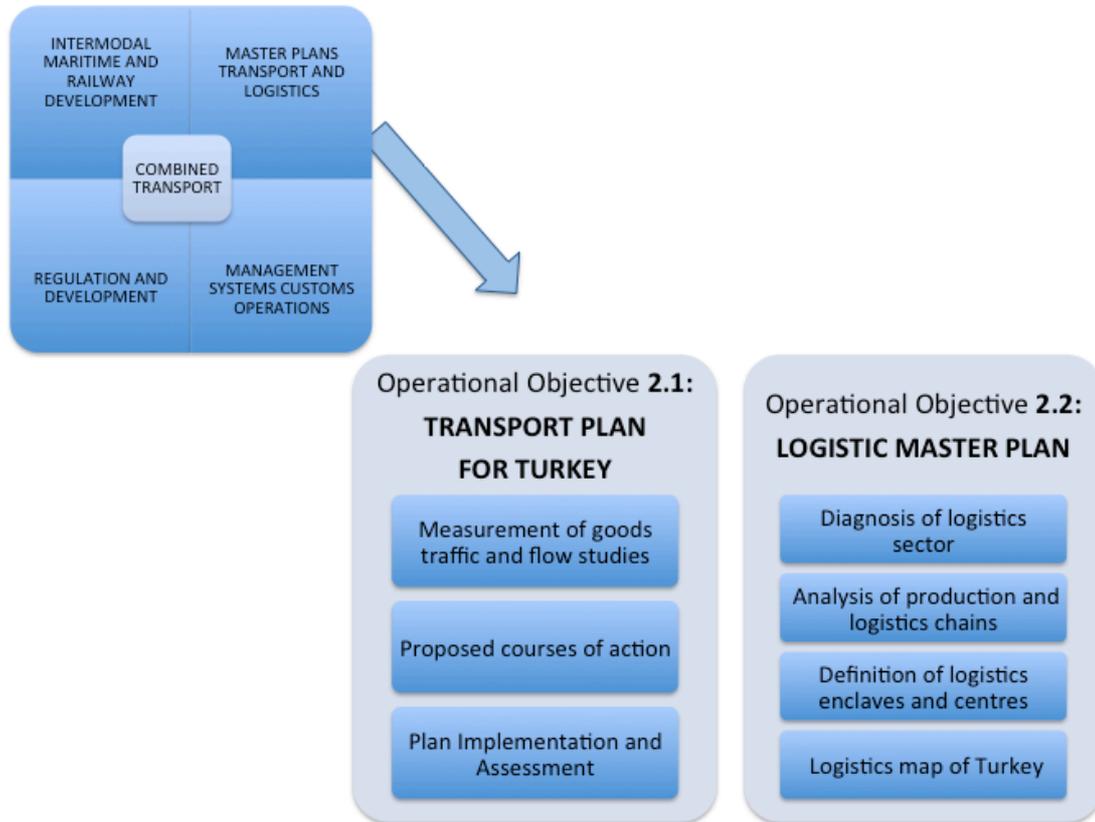
The overall profit margin of the publically owned Combined Freight Terminal shall be the achievement of a positive operating margin.

With respect to these actions, the plan is for the DGCTR to integrate the statistical reporting process as regards the operation and functioning of the publically owned Combined Freight Terminals in accordance with the data it receives from the General Directorate of Turkish State Railways Administration (TCDD), Turkish Railway Transportation Corporation (DETAS) and the private sector.

On the other hand, it is recommended that the DGCTR insists, where appropriate, on the carrying out of audits in the publically owned Combined Freight Terminals and parameterises the external quality controls with respect to the services provided in the publically owned Combined Freight Terminals.

**STRATEGIC OBJECTIVE 2: TURKISH MASTERS PLAN:
TRANSPORT AND LOGISTICS**

The working targets specified in strategic target 2 are shown in the following diagram:



Graph 11 : Turkish Combined Transport Strategic Objective 2: operational objectives

OPERATIONAL OBJECTIVE 2.1 PREPARATION OF THE TRANSPORT MASTER PLAN FOR TURKEY

JUSTIFICATION

Interrelations between economic growth and the increase in the demand for transport are multiple and complex. Said demand for transport is a result of the demand for goods and services.

Consequently, one crucial determining factor for future development will be variation in the demand for said goods and services, directly related to the growth of a country's economy.

An advanced transport system is one of the main driving forces behind the economy.

However, growth of the world demand for transport comes in a context of **polarisation** of the global **modal pattern** towards the use of **roads**, whereby growth in demand and the polarisation of the pattern is worsening the problem of road congestion to the point where, in Europe, for example, 7500 km of roads (10% of the grid) are currently affected by traffic jams on a daily basis. This represents a loss in competitiveness for the economy estimated at 0.5% of the EU GDP.

Consequently, the development of transport plans in line with the economic development of a territory is an urgent decision for governments, which have approached the preparation of projects that disassociate economy from transport (on a European scale, SPRITE, TERM or REDEFINE), returning results that show that most of the increase in the demand for transport can be explained by the increase in the average distance travelled by the goods that are processed.

An analysis of international goods transport reveals a number of trends:

- The volume of goods transported by road has grown more quickly than the GDP, whereas those transported by rail have grown slowly or have decreased.
- Road transport is by far still the mode of transport with the highest share.
- There is a desegregation of the tonnes-kilometre of goods between tonnes loaded and average distance travelled that shows that the contribution of these two variables to the total increase of tonnes-kilometre has varied over time.
However, the increases in the average distance travelled have been the main source of growth in recent decades.

The foregoing trends, complemented with a number of substantial changes to the way in which the load is handled, need to favour the essential start-up of combined transport as a factor for the promotion of transport in general:

- Restructuring of goods management systems: spatial concentration, plant specialisation and inventory to maximise the load of each vehicle between warehouses.
- Readjustment of transport schedules and times (just-in-time)
- Changes to load management: increase of allowed capacity for trucks.

Furthermore, the evolution of the demand for transport, through substantiation in intra-industrial trade, incorporates growing pressure on the efficiency of the logistics chain, a key factor for fostering the use of more than one mode of transport.

This refers to parts, accessories and inputs that are necessary to produce and constitute the inputs for the next production process the physical location of which may be at a greater or lesser distance.

This growing logistical dimension requires the incorporation of progressively more mature transport operators with the capacity for managing increasingly complex chains with high levels of intermodality.

However, the logistics dimension must not be incorporated in relation to inter-company trade.



The guidelines for consumption, together with the distribution strategies, are significantly changing the demand for goods transport and represent the fundamental issue on which a transport plan is to be based.

The general trend of avoiding storage, the breaking-up of orders, the design of logistics platforms in accordance with rotation, the specific requirements of metropolitan areas, optimisation via the *cross docking* of industrial requirements, dry docks, port logistics activity areas and other initiatives lead us to a situation in which investment in logistics must not be conceived as an accessory, but rather as a crucial part of the modal pattern transformation process that will unavoidably lead to intermodality.

Indeed, globalisation requires and develops interconnection and exchange.

And these dimensions have increased their effectiveness over the last five years at a rapid rate owing to the confluence of the following issues:

- appearance of information technologies, optimising processes and eliminating inefficiencies in the document processes associated with trade.
- real political deregulation of capital and goods exchange practices.
- opening-up of borders and the free circulation of individuals and goods.

The integration of both issues has led to a sustained annual growth in exports of 6% in industrialised countries since 1970.

In other words, the consecration of transport as the driving force behind the global economy.

The existence of a direct correlation between a country's macroeconomic growth rate and its international trade volume has been demonstrated: the higher the growth, the higher the number of exchanges.

Land transport shows a consolidated trend towards the organisation of integrated maritime-land services under the principle of the "door-to-door" movement of goods.

Said service has become common in the transport of containers. Accordingly, many shipping companies have to have a land transport service that is often provided by rail, but mainly by truck.

Connections with the hinterland by land transport have been positioned as a key factor for choosing the shipping route or trajectory to select the cheapest cost.

The essence of modal maritime-land exchange consists of optimising the port operation to obtain maximum economy in the intermodal transfer process.

This context includes the working target for drawing up the Integral Transport Plan of Turkey, which must include the analysis of the various options for developing the country's transport system, together with a study of the figures and records that are required for the definition and configuration of the system, its economic evaluation and institutional design and ultimately the full definition of an integral transport plan for Turkey that covers the fundamental lines of the transport system for the 2014-2020 scenario.

As far as passenger and goods transport is concerned, the Plan will include land, air and maritime transport in terms of sectors and their interrelation and intermodality.



The governing principles behind the preparation of this Plan are as follows:

- To guarantee the right to mobility of all the population, placing particular importance on the requirements of individuals who suffer from reduced mobility and the restrictions of public transport.
- To draw up an integral proposal for the transport system as a whole at the lowest possible cost for service and quality standards that guarantee universal access to the system.
- To contribute to the reduction of accidents and their effects.
- To guarantee the social, economic and environmental sustainability of the public transport system.
- To improve the coverage of the collective transport system in terms of time and space in accordance with the various towns and cities and citizens' demand for mobility.
- To minimise negative external factors related to mobility.
- To foster the use of collective transport and other less pollutant modes rather than the use of private vehicles.
- To increase and foster the competitiveness of the transport sector as a whole.
- To optimise the financial resources allocated to mobility management.

ACTION PLANS FOR OPERATIONAL OBJECTIVE 2.1

The Transport Plan of Turkey comprises the following action plans:

- 2.1.1. Measurement of traffic and goods flow studies.
- 2.1.2. Proposed courses of action.
- 2.1.3. Plan Implementation and assessment.

OPERATIONAL OBJECTIVE	PLAN OF ACTION	LINES OF ACTION
2.1. TRANSPORT PLAN FOR TURKEY	2.1.1.- Measurement of goods traffic and flow studies	2.1.1.1.- Design of traffic measurement model
		2.1.1.2.- Characterization of goods flows
	2.1.2.- Proposed courses of action	2.1.2.1.- Proposed Courses of Action with regard to Infrastructure, Services and Management
		2.1.2.2.- Proposed Courses of Action with regard to Non-Infrastructure or Services Aspects .
	2.1.3: Plan Implementation and Assessment	2.1.3.1.- Organizational and financial strategy
		2.1.3.2.- Competitive services supply strategy
		2.1.3.3.- Competitive environmental supply strategy

Table 3: Action plans and lines for Operational Objective 2.1

Plan 2.1.1: Measurement of traffic and flow studies. Characterisation of flows.

This plan comprises the following lines of action.

2.1.1.1. Design of the traffic measurement model

Consists of performing goods flow studies to discover the levels of traffic by land transport and the origin-destination matrices of the goods.

The Transport Plan must be drawn up based on figures that are constant over time and statistically reliable that show the actual situation of goods movement and routes in specific periods.

The Plan requires the analysis of territorial administrative and geographical issues and the characteristics of the goods and the locations of their origins and destinations.

Socio-economic characterisation is fundamental for discovering the goods traffic that exists between the regions of Turkey and its future evolution.

Accordingly, it is essential to achieve an approximation regarding population, level of wealth or income and main socio-economic activities that may define the goods flows in Turkey.

Consequently, the following variables apply:

- Population: Structure of the population according to age, occupation and economic activity. Evolution.
- Occupation: Distribution according to active workers, unemployed and activity sectors. Evolution.
- Income: Distribution according to income level. Evolution.
- Motorisation: Level of motorisation. Evolution.
- Businesses: number of businesses, size of businesses. Evolution.
- Gross Domestic Product. Production sectors.
- Tourism: visitors, hotel beds, spending per visitor, visitor's origin, average stay.
- Tourist, industrial, business and educational attraction centres.

The above socio-economic variables explain mobility between the different areas of the country, analysing its evolution and past and present behaviour.

This information is the starting point for forecasting said variables and, therefore, what the future goods flows will be.

The socio-economic variables will be forecast by analysing trends.

This focus includes the evolution of the variable and makes it possible to suggest future behaviour.

Time series models are forecasting techniques based exclusively on the "history" or behaviour of the variable that is being analysed over time.

The forecast will be made in accordance with the patterns shown in the historical data and extrapolated to the future.

2.1.1.2. Characterisation of goods flows

The Plan will define the global directives for the sustainability of the Goods Transport System and a global framework of action will be defined, together with alternative scenarios that include a sector-based action proposal for each mode of transport.

Accordingly, a comparative analysis will be made of the different modes of transport that may compete with each other in the country and as part of its interconnection and development with nearby and border countries.

This will provide a real assessment of the advantages of each mode in relation to demand and a view of the adaptation of the modes to existing real demand.

For each mode, a comparative analysis will be made of the following:

- Characterisation of flows
- Analysis of infrastructures
- Offer of routes
- Development of associated services
- Issues related to the promotion and management of services
- Type of the demand
- Commercial issues and prices
- Characterisation of flows
- Safety
- Energy control

The Plan requires the analysis of trends on the market and the development of services and connections related to each mode, which may represent a key factor for detecting the competitiveness of the Goods Transport Network of Turkey, studying adjacent markets, the global demand for services and the distinguishing aspects of the offer for each one.

As a conclusion, it will determine the elements that restrict the development of the competitiveness of the transport system so that they can be eliminated.

Plan 2.1.2: Proposed courses of action.

The needs of Turkey's transport system and the evolution in terms of trends regarding current and future scenarios require a number of actions that enable the implementation of the strategies considered so that the desired scenario can be achieved.

They are as follows:

2.1.2.1. Action Proposals for Infrastructures, Services and Management.

They must be classified as follows:

- Proposals for coordinating actions on linear infrastructures. An analysis will be done on the management and coordination of existing services on transport lines and nodes.
- Proposals for coordinating actions on nodal infrastructures. These will focus on the nodal elements of the Turkish network to improve the management of services and reduce internal movement times between access points to the different nodes.
- Proposals for Coordinating Transport Services. The optimisation of management and operators on the transport network will enable a significant reduction of average waiting times on the nodes.
- Proposals for the development of Innovation Projects.

2.1.2.2. Action Proposals on non-infrastructures or services.

In the current context, the action on the transport offer is insufficient; costly investments in infrastructures have not achieved the targets that were set, mainly due to lack of knowledge of potential users.

Proposals related to non-infrastructures or services are distributed as follows:

- Proposals related to procedures and designs. Actions on legislative frameworks and institutional promotion.
- Proposals related to the eligibility and generation of projects. The entity projects that are to be executed during the term of the Plan will be subjected to specific analysis so that the design takes into account the minimum facilities required for effective changes at operation nodes, together with the rational management of the joint capacity of the linear infrastructure.
- Proposals for support actions and the promotion of intra-operability in relation to transport authorities, agents and operators.

For the preparation of the Action Proposals, an analysis will be made of the evolution, current situation and future outlook of Turkey's transport in its relationship with international and national connections.

Accordingly, the characteristics of the market on which each of the modes of transport competes will be examined to obtain an overview of the impact of the development of the Plan.

The keys for designing a competitive strategy that focuses on demand and services will be determined.

Furthermore, negative and positive critical institutional and socio-economic factors will be identified when they are liable to affect the development strategy of the Plan.

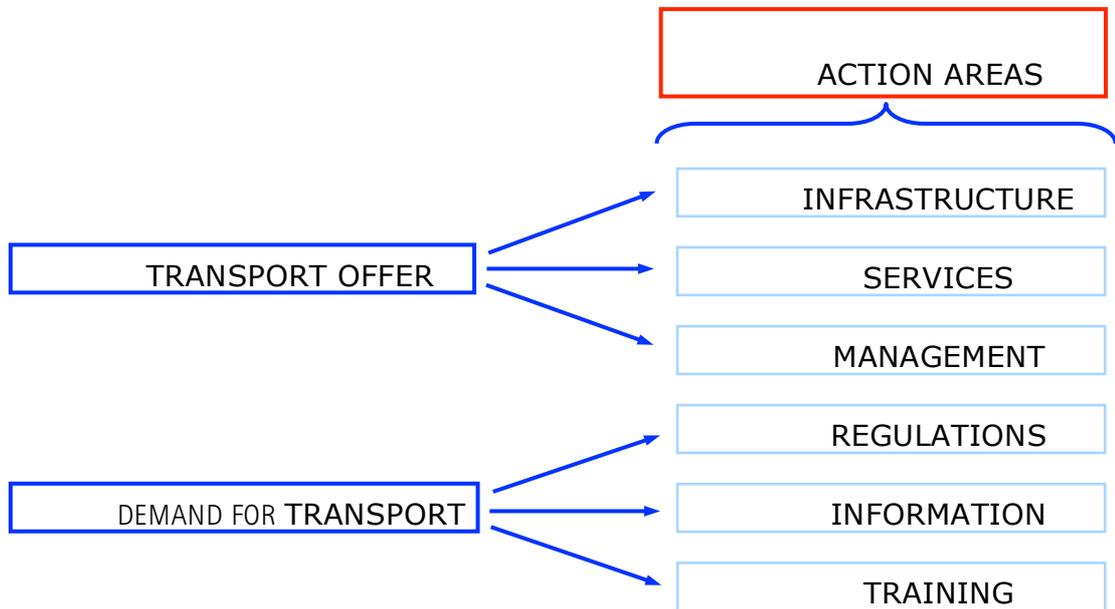


Image 11: Action Plan Proposals Diagram

With regard to the assessment of the current situation, for each area of analysis subject to action, the basic issues will be identified when the requirements have a greater specific weight on the Turkish transport system and the eligibility of the alternative for the movement of the goods in order to propose the general targets that are to be achieved through the development of the Plan.

The Integral Transport Plan of Turkey will comprise one action document for each mode.

Plan 2.1.3: Implantation and evaluation of the Plan.

The set of strategies that will make up the Plan will be drawn up in accordance with criteria based on sustainability and technological innovation in order to diversify the market and improve the use of existing transport infrastructures.

The policies and activities will also be defined to achieve the extension and modernisation of the current Turkish network.

Consequently, a number of recommendations for consolidation will be proposed.

Then, the following strategies will be drawn up:

2.1.3.1. Organisational and financial strategy

This implies the design of a system for organising the development of the Plan that includes the creation of areas and departments with specific targets and priorities.

The participating entities and institutions will be taken into account.

Furthermore, a **functional organisation chart** will be proposed to establish the lines of hierarchical and functional dependence, evaluating workloads and levels of technical requirement for the various management and technical levels.

A **finance strategy** will also be designed through the evaluation of the sources of finance for the funds (Administration's own and third-party resources).

And an analysis will be done of the channels of finance or complementary subsidies that may apply to the project in keeping with other modal transport actions.

This finance strategy will consider the following issues:

- ✓ Identification of business areas for private investors.
- ✓ Definition of investment levels required for each mode.
- ✓ Definition of the strategic profile of the potential investor in each mode.
- ✓ The commercial strategy for attracting investors will also be designed.

2.1.3.2. Competitive strategy for the offer of services

One feature of the competitiveness of transport systems is the concentration of services for customers and users.

The Plan must include all the activities and services that are necessary for supporting the activity of all kinds of sectors and shape itself as an integrated services system.

2.1.3.3. Competitive offers strategy of the surrounding environment

This activity will study the competitive strategy of Turkish transport as compared with the surrounding environment:

- ✓ Concentration of the offer of external, complementary services.
- ✓ Quality business environment with the promotion of institutional and administrative support areas for developing activities.
- ✓ Focus as large-scale equipment for regional economic development.
- ✓ Network coordination with other cross-border intermodal nodes and initiatives.
- ✓ Internal models for offers and promotion.

OPERATIONAL OBJECTIVE 2.2: TURKISH LOGISTICS MASTER PLAN

JUSTIFICATION

Conceptualisation of logistics

The globalisation and deregulation of markets over the last few decades have accelerated the transfer of positive and negative impacts to the modus operandi of the business world.

At the same time, organisations have acknowledged the growing importance of logistics and physical distribution as elements for developing competitive advantages over competitors.

The modern concept of logistics comes as a multi-factor response from organisations to satisfy their customers' growing demands.

The traditional definition of logistics is as follows:

"Operative function that comprises all the activities and processes that are necessary for the strategic Administration of the flow and storage of raw materials and components, stocks in process and finished products; in such a way that they exist in the right quantity, in the right place and at the right time".

In 1980, Peter Dracker wrote:

"When engineers have optimised the production chain and sellers have reached the highest possible market share, there is only one option left:

to improve flows from the supplier to the factory and from the factory to the end consumer.

In other words, logistics, the final frontier of competitiveness."

Consequently, logistics seeks to strategically direct the acquisition, movement, storage of products and control of inventories, together with all the associated information flow, ensuring the present and future efficiency of goods movements in terms of cost and effectiveness.

Logistics operations developed in territories with their own physical-economic characteristics make a direct contribution to the creation of wealth. That is, as long as nations equip themselves with first-class logistics networks, consisting of the effective integration of transport infrastructures, corridors and multi-purpose, specialised logistics centres.

In order to ensure the successful use of a country's logistics potential, the existing physical comparative advantages (geographical location, coastline, lie of the land) need to be transformed into competitive advantages by defining and starting up Master Plans for Action in Logistics.

The current environment is characterised by the globalisation of the economy, increasing competition and, in general, economic development linked to foreign trade.

These phenomena include an exponential increase in the demand for goods transport as well as their storage requirements.

Logistics plays a fundamental role in this system.

It is an age-old science designed at the dawn of civilisation to foster the development of trade and was, at the outset, already conceived for success through the balanced and holistic integration of the following elements:

- Production maps.
- Transport infrastructures.
- Combined transport corridors.
- Logistics centres networks.

In other words, logistics users combined transport corridors with the appropriate transport infrastructures to connect production centres with consumer centres.



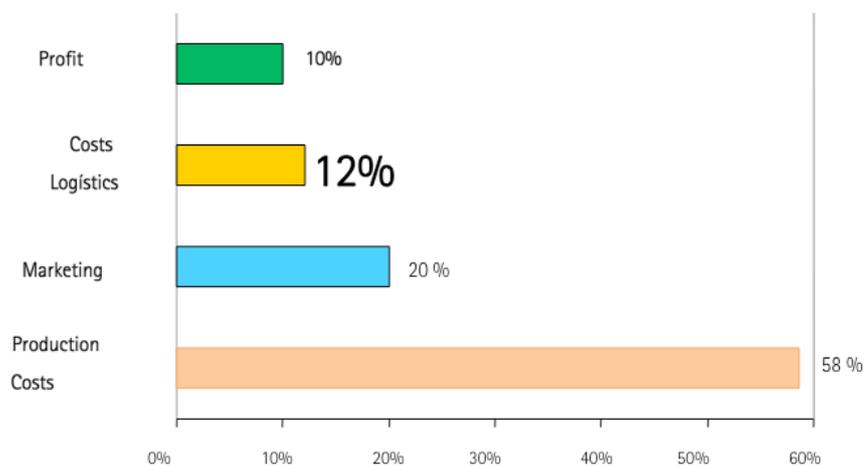
Image 13: Map of Spain in Roman times with logistics corridors

At the present time, logistics plays a crucial role in the economy by guaranteeing the optimal movement of goods between regions in every production sector.

Logistics seeks to **add value to products** (packaging, container, labelling, etc.) at the lowest possible cost. Accordingly, its mission consists of guaranteeing the **full availability** of a product on every market, guaranteeing supplies to the populations and companies by which it is demanded.

The organised development of logistics in a country (which involves integrating production centres with consumer centres through transport infrastructures located in combined transport corridors) enables the following:

- Adaptation of operators' response to the needs of demand: personalised service.
- Synergies in transport, handling and storage to offer producers competitive rates that adapt to actual needs.
- Scaled use of the capacities of each player on the combined transport chain.
- General reduction of transport costs by between 4 and 6 %. This is particularly relevant given the standard structure of costs for all nations, in which logistics costs stand as a significant limitation to profits:



Graph 12: Standard structure of business costs

International logistics

International logistics has become one of the key sectors in the current world economy due to the impact it has on the movements of international economic globalisation (foreign trade), new technologies and support for industrial activities (just-in-time logistics).

This means that logistics infrastructure with an appropriate international size is an essential element for positioning a country on the global economic scenario.

The study of current international logistics movements is seen as one of the most important elements for understanding the international economic situation and the insertion of different countries in the new globalised world economy.

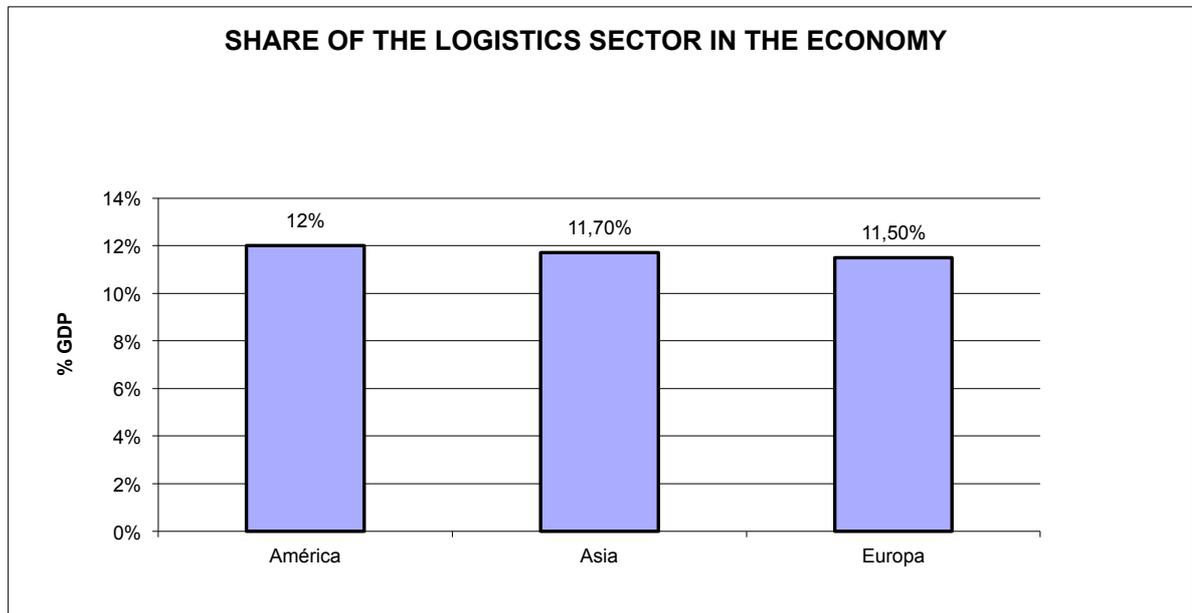
The importance of the study lies in the essentially strategic character of logistics flows in the national and international business fabric.

The current international logistics sector is defined through the existence of large regional operators that obtain their strength through acquisitions or alliances on a global scale, owing to the fact that it is a sector in which international geographical expansion is its own *raison d'être*.

The importance of understanding a country's competitive situation in international terms is basically strategic, since said positioning will affect many other variables (industry, trade, international marketing, new technologies, economic globalisation).

The international process of economic globalisation must give rise to an advanced, specialised business system in terms of logistics that enables coordination between production-consumption centres that are located at significant geographical distances.

The world market of the logistics sector moves \$12 billion per annum, which accounts for 11.7% of the World Gross Domestic Product.



Graph 13: Logistics as % of GDP

Logistics Master Plan: concept, scopes and elements

A Logistics Master Plan seeks to define, on the so-called "logistics map" (integration of a territory's production centres with its consumption centres through combined transport corridors in which the logistics centres are situated), the logistics resources of a territory for systematically connecting the logistics services provided in the country with national and international production chains.

The aim of the Master Plan is to ensure the logistical development of a territory, based on its comparative advantages, which usually include geographical position, the lie of the land and economic issues, such as legislation that favours international trade.

A Logistics Master Plan is built on a time horizon in keeping with the forecast for the development of a national economy and it must always focus on market demands and needs.

In turn, it must take into consideration the forecasts for growth of the world economy.

A Master Plan has the following **specific targets**:

- ✘ To analyse and diagnose, using a Logistics Map, the logistical resources of a territory according to the geographical areas in the country.
- ✘ To detect the niches for opportunities that represent competitive advantages in the logistics services associated with the country's current and future infrastructures.
- ✘ To foster regional economic development by means of adequate planning and performance of logistical activity and trade.
- ✘ To promote the integration and strengthening of supply chains with the help of logistics.
- ✘ To foster the development of national logistics parks with an international presence.
- ✘ To study a territory's competitive environment and its possible evolution, together with the factors that may affect demand and the offer of services, operators and hauliers.
- ✘ To identify the opportunities analyse of business and their possible evolution in the short, medium and long term regarding the logistics services associated with the country's current and future infrastructure.

A Master Plan consists of an analysis of a territory's current logistics context, the diagnosis of production and logistics chains and the consideration of a network of combined transport corridors that integrate logistics centres.

Therefore, it implies an in-depth review of the need for facilities and equipment and their integration in the global logistics map.



Turkey and Logistics

The need for a Master Plan

Thanks to its natural comparative advantages and its consistent economy, Turkey is ready to consolidate its position as one of the main logistics platforms in the world at the service of international trade.

Given the new conditions affecting the international environment and competition from other countries, Turkey has to develop conditions that allow it to move from "artificial competitiveness" to "real competitiveness", based on structural combined transport networks making up a grid of logistics centres designed to add value to goods in transit.

The strengthening of competitiveness and the domestic market increase the possibility of Turkish products being able to maintain and increase their share of the exports market and, in view of new international conditions, they constitute the only way of generating sustained growth, employment and investment.

The clearest way in which a State can develop its competitiveness is undoubtedly by identifying and fostering its logistics chains: an adequate integration plan for logistics chains is capable of reshaping Turkey's competitive advantages and, above all, it will enable maximum use of auxiliary logistics infrastructures.

Consequently, the preparation of a Logistics Master Plan in Turkey is essential to design and start up an appropriate framework for the planned, organised and coordinated establishment of areas for the development of logistics centres and support centres for the supply chain that provide value-added services across the country.

These logistics centres and support centres for the supply chain must contribute to the development of Turkey's other economic sectors.

The Plan must define the concept of platform between Asia and Europe to identify the logistics services and products that are to be offered on each chain, as well as the advantages Turkey offers to the region and the world.

Turkey on the international logistics scenario

The World Bank, in the third edition of the study titled "*Connecting to Compete: Trade Logistics in the Global Economy*" (2012), has published the Logistics Performance Index (LPI), a document that has been drawn up biennially since its first edition in 2007.

The aim of the LPI is to **measure the logistics actions carried out in 155 countries** to provide politicians, administrators and managers of private enterprises the key factors for understanding the challenges that are to be overcome to showcase actions taken in the area of logistics.

The LPI is configured as a powerful, simple and global **benchmarking** tool for measuring the **logistics development** of each nation and providing focuses that optimise said performance through the systematic comparison of the results achieved by other countries.

The LPI comprises the following six components:

1. Efficiency of the customs process (speed, simplicity and understanding of the formalities that are required) by the border control agents, including customs.
2. Quality of the infrastructures related to transport and trade: ports, roads, railways and associated information systems.
3. Facility for agreeing competitive costs and freights.
4. Capacity and quality of logistics services providers: transport operators, customs agents, etc.).
5. Traceability of logistics operations and customers' shipments.
6. Fulfilment of delivery deadlines.

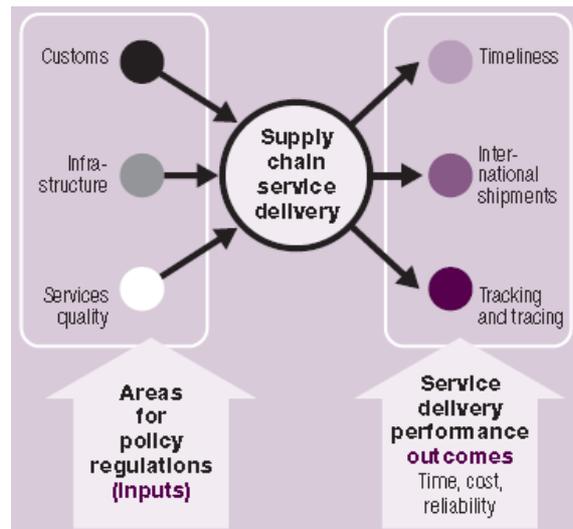


Image 14: Logistics performance index

These indicators can be classified in two groups to make it easier to assess the performance of the different nations:

- Fulfilment of policies: infrastructures, customs and service quality.
- Provision of services: punctuality, international freight, traceability.

The following table includes the top 10 nations according to their logistics performance index (measurement taken in 2012).

Table 1.3 The top 10 upper middle-income performers on the 2012 LPI

Economy	2012			2010			2007		
	LPI rank	LPI score	% of highest performer	LPI rank	LPI score	% of highest performer	LPI rank	LPI score	% of highest performer
South Africa	23	3.67	85.5	28	3.46	78.9	24	3.53	79.4
China	26	3.52	80.5	27	3.49	79.9	30	3.32	72.8
Turkey	27	3.51	80.3	39	3.22	71.4	34	3.15	67.5
Malaysia	29	3.49	79.8	29	3.44	78.4	27	3.48	77.7
Bulgaria	36	3.21	70.7	63	2.83	58.8	55	2.87	58.6
Thailand	38	3.18	69.6	35	3.29	73.6	31	3.31	72.5
Chile	39	3.17	69.5	49	3.09	67.3	32	3.25	70.5
Tunisia	41	3.17	69.4	61	2.84	58.9	60	2.76	55.3
Brazil	45	3.13	68.2	41	3.20	70.6	61	2.75	54.9
Mexico	47	3.06	66.0	50	3.05	65.7	56	2.87	58.6

Source: Logistics Performance Index 2007, 2010, and 2012.

Table 4: Logistics Performance Index 2012



Turkey has moved from 34th position in 2007 to 27th in 2012.

This represents a positive development but it is not sufficient for the country to develop all its logistics potential and place it at the service of Turkish producers and international operators.

It is important for Turkey to optimise its position in the index, a task that becomes crucially important for the preparation of the Logistics Master Plan in Turkey. Said Master Plan will have the mission of facilitating the development of exchanges and connections between production centres and large logistical nodes through efficient combined transport networks.

As an example of the history and current economic situation, the countries with the best logistics infrastructures grow more quickly and in a more sustainable way, optimising the competitiveness of their industries and attracting more international investments.

However, logistics development can be achieved in two ways.

The first lies in "*being a place on the way*", in other words, being located on a node that is or may become the confluence of commercial arteries, understood simply as goods transit.

The second is when a territory has important production chains that have not reached their peak owing to the lack of logistics infrastructures that make it possible to maximise marketing, from the optimisation of supplies to the accuracy of the supply to the point of sale.

Turkey has a dual channel for developing its logistics infrastructure and the following action plans need to be launched as the working target of the country's Logistics Master Plan.

ACTION PLANS FOR OPERATIONAL OBJECTIVE 2.2

Turkey's Logistics Master Plan must be an introduction and contain the definition of the key logistics concepts:

- Corridor
- Logistics centre or location: types
- Location and size of the centres.
- Logistics services

When an agreement has been reached with all the stakeholders involved in combined transport regarding the definition of these concepts, the working target 2.2 of the Combined Transport Plan of Turkey consists of the following action plans:

- 2.2.1. Analysis of the logistics sector in Turkey.
- 2.2.2. Analysis of the production and logistics chains in Turkey.
- 2.2.3. Definition of logistical locations: centres.
- 2.2.4. Logistics Map of Turkey.

The four plans must be developed sequentially.

OPERATIONAL AIM	PLAN OF ACTION	LINE OF ACTION	ACTIVITY	
2.2. MASTER LOGISTIC PLAN FOR TURKEY	2.2.1: Diagnosis of logistics sector	2.2.1.1. Analysis of the transport infrastructure associated with the logistics sector		
		2.2.1.2. Analysis of the logistics supply	2.2.1.2.1- Real estate and services supply 2.2.1.2.2- Supply trends 2.2.1.2.3- Logistics operators	
	2.2.2: Analysis of production and logistics chains	2.2.2.1.- Study of production sectors		
		2.2.2.2.- Analysis of production chains	2.2.2.2.1- Description of roles and volume of links 2.2.2.2.2- Regional production chain	
		2.2.2.3.- Description of logistics chains	2.2.2.3.1- Description of roles and volume of agents 2.2.2.3.2.- Equipment: cranes, bays, up to special special terminals or logistics areas. 2.2.2.3.3.- Chain flowchart: processes, actors. 2.2.2.3.4.-Socio-economic impact of chain on a region and recommendations.Development.	
		2.2.3: Definition of logistics enclaves and centres	2.2.3.1.- Determination and location of logistics enclaves 2.2.3.2.- Strategic design of each enclave	2.2.3.2.1.- Real estate supply 2.2.3.2.2.- Services supply; 2.2.3.2.3.- Functional Design:
	2.2.4: Logistics map of Turkey	2.2.3.3.- Analysis of technical, socioeconomic and institutional feasibility.		

Table 5: Action plans and lines for Operational Objective 2.2

Plan 2.2.1: Analysis of the logistics sector in Turkey

This consists of comprehensively analysing the current situation of the sector to draw up the initial Turkish logistics map and understand the desired situation that is to be reached in the medium and long term via the application of the subsequent plans that correspond to this target.

The analysis will also determine the voids in Turkish logistics at the present time, as well as operators' demands.

This plan comprises the following lines of action.

2.2.1.1. Analysis of the transport infrastructure associated with the logistics sector

Review of all the existing infrastructure types (roads and transport, development centres, clusters, etc.), and the assessment of their level of use and operating conditions for logistics operators.

Transport infrastructures condition not only the development of combined transport, but also the logistical development of a territory.

2.2.1.2. Analysis of the logistics offer

Study of Turkey's active logistics centres according to region, including dry docks, logistics-port activity areas and distribution centres, among others, to determine Turkey's competitive logistics profile as a logistics services supply centre.

The following will be analysed according to centre in operation in each region:

- ✗ Traffic type with more/less competitiveness
- ✗ Services offered
- ✗ Promotion and management
- ✗ Characterisation of the logistics community in the area of influence
- ✗ complementary services provided to customers: banking, health, leisure, etc.

2.2.1.2.1 Real estate offer and services

This activity will lead to information about the real estate offer and services in each area (understood as the summary of the services offered by its centres):

- Range of existing real estate offer, which may be:
 - Premises for sale
 - Premises for rent
 - Developed plot of land for sale
 - Offices for rent
 - Products available for leasing
- Characteristics of the existing real estate offer: locations, accessibility, complementary services, physical type of facilities, sizes, etc.
- Characteristics of the offer of services: customs, vehicle, individuals, etc.

2.2.1.2.2. Offer trends

To understand the offer planned for the short or medium term that may act as the logistics development of Turkey in each geographical area, taking into account that there are two different levels in the operators' implementation strategies:

- on a national scale, which are on a broader level.
- in a specific location or node.

2.2.1.2.3. Logistics operators

This activity pursues the following:

- To analyse and describe the logistics operators working in Turkey or that have a project for doing so in the short term:
 - Nationality of the operator and type of investment made.
 - Location.
 - Services offered.
 - Type of goods handled.
 - Origin and destination of goods.
- Define optimal characteristics to attract logistics operators to the Turkish logistics market.

Plan 2.2.2: Analysis of production and logistics chains

Study of the demand for logistics in Turkey to determine the main sectors that need to be attended to regarding the combined transport networks and associated logistics centres and define the type of services to be offered by the different locations to satisfy customers' demand and add value to the product in transit.

Accordingly, consideration will be given to the services demanded by the various productive sub-sectors that have been taken into account.

The analyses of demand will detect the most widely accepted or most suitable logistics service for the potential users at each location.

The aim of the plan is to refine the points of maximum economic interest (sector relevance) to determine the level of attraction of each region in Turkey for positioning logistics centres that form part of the combined transport networks and that are designed to support the production and supply chains for consumer centres.

The plan is being developed along the following lines of action:

2.2.2.1. Study of production sectors

Characterisation of Turkish regions in terms of production so that the analysis includes the relative impact of the logistics services on the development of each region.

The most representative sectors and the regions they influence will be determined and their presence will be described as a source of development.

2.2.2.2. Analysis of production chains

Identification of the economic activities and industries that make the largest contribution to the national GDP and/or those that represent the greatest strengths, together with those for which their geo-economic location means that they can be developed on the basis of logistics infrastructures.

Production chains constitute the set of agents and activities that take part in the production process in a specific region.

They include the supply of consumables and raw materials, their transformation and the production of intermediate and end products, with their commercialisation on domestic and foreign markets, including services suppliers, the public sector, technical service institutions and financial institutions.

This analysis is developed in accordance with the following sequence:

2.2.2.2.1. Description of roles and volume of links

The links in the production chain are made up of different players: producers, intermediaries and end customers.

These players represent a share in the added value of the end product, with a specific level of participation in the sector.

The sector is analysed nationally and regionally.



2.2.2.2.2. Regional production chain

The production chain describes the size and relevance of the chain in a certain region.

This activity shows the impact of the sector on an area: regions can be producers in themselves, suppliers of consumables for the production chain or "logistics launch pads", i.e., their strategic location makes them logistical agents in relation to the supplier-manufacturer.

2.2.2.3. *Description of logistics chains*

Analysis of logistics chains that affect the production chains to identify competitive strengths and weaknesses.

All production chains comprise a logistic chain that guarantees the stock of consumables required for generation operations and constitute the commercialisation process up to point of consumption.

A logistics chain manages the activities that make it possible to distribute and efficiently supply consumables to the demanding markets.

It comprises the following lines of action:

2.2.2.3.1. Description of roles and volume of agents

2.2.2.3.2. Equipment: cranes, buildings, special terminals and logistics zones

2.2.2.3.3. Flowchart of the chain: processes, players.

2.2.2.3.4. Socio-economic impact of the chain on a region and recommendations. Evolution.

Plan 2.2.3: Definition of logistics centres and locations

Preparation of the guidelines for constituting comprehensive Logistics Map for Turkey, including the development of different regions and production chains.

Definition of the type of centres that are to be developed at each location to achieve operational success.

The choice of each logistics location and its placement will be justified, including the required intermodal connectivity and the logistics services that are to be provided. This guarantees that the selection of locations is coherent and ensures viability and competitiveness.

The main premises for developing the **Logistics Map of Turkey** is that the logistical locations that are selected must complement each other and increase regional development.

The plan has a dual objective:

- to provide an action guide for the identification, definition and start-up of logistics centres that form part of the combined transport networks, where said guide must be confirmed by the agents and operators that are interested in starting up a centre.
- To prepare a register of potential logistics centres those are to be started up in Turkey to meet the requirements of the production and logistics chains.

2.2.3.1. Determination and location of logistics centres

Definition of "key" logistics centres in the future Logistics map of Turkey.

For each of the centres that are identified, their start-up will be justified, together with their suggested location and distinguishing characteristics.

The **justification** for the definition and start-up of a logistics centre will be determined by the following criteria:

- Proximity to production and/or consumption centres
- Location on production and logistics chains
- Integration in combined transport corridors
- Existence of unsatisfied logistics demands
- Socio-economic and financial viability

The **location** of a logistics centre in a specific territory will be determined by the following criteria:

- Intermodal connectivity
- Ground space: availability of hectares, hidden easements, proximity to rivers-lakes, prevailing winds.
- Geotechnical criteria: classification of ground space, thickness of continuity, ground humility, groundwater level.
- Basic supplies: water, electricity, gas, communications, sewage, collective transport.
- Social: specialist population, unemployment.
- General services

2.2.3.2. Strategic design of each centre

Key activity for the functional viability of the logistics infrastructures to reach an appropriate definition of their strategy and then position them on the market through the commercial policy appropriate to the demand.

The strategic definition of each location must include the following elements:

2.2.3.2.1. Real estate offer

It must combine two types of elements:

- Structure: types of demands from the various user sectors.
- Situation: variations of the demands according to phases of the economic cycle and stages of development of the user sectors

2.2.3.2.2. Offer of services:

Includes:

- ✗ basic
- ✗ general for businesses, vehicles and users
- ✗ customs and para-customs
- ✗ intermodal
- ✗ telematics
- ✗ value-added

2.2.3.2.3. Functional Design

The adaptation of means of transport to logistics processes implies an impact on the land and the environment in terms of pressure and quality requirements.

Said impacts must be dealt with in a way that guarantees balanced industrial and logistical development in the space assigned to each centre.

Accordingly, the design of the centres must take the following into account:

- Need for second-line ground space
- Good accessibility to the nearby environment and its competitive "hinterland"
- Allocation of specialised industrial and logistical uses in differentiated logistical and industrial areas

After the selection of a functional type for the logistics centre, its functional areas will be defined as a first step towards spatial organisation in accordance with its functional focus (fostering its multi-purpose nature as far as possible).

Specific sizing criteria will be set for each functional area, conditioned by the following:

- Possible international development
- Variations to traffic flow type and volume
- Requirements or needs of the companies in the sector

The functional diagram of each logistics centre will comprise the following:

- Functional Areas or Units
- Functionality or vocation of each area
- Accessibility to the different modes: roads, railways, ports, micro-accessibility and macro-accessibility.
- Time phases and development (short, medium and long-term)
- Main magnitudes: surface areas, uses, roads
- Complementary works

2.2.3.3. Analysis of technical, socio-economic and institutional feasibility

An integral analysis of the feasibility of the project must be done for each logistics location that is proposed:

Socio-economic viability

Estimation of social impacts and benefits generated by location.

The benefits must be considered in terms of the reduction of logistics costs and impact on sector organisation, etc.

Consideration must also be given to the benefits generated by the new activity in terms of revitalising the local and regional economies at the location of new activities, since this is one of the relevant issues considered as a consequence of the development of logistics locations.

Global investment costs must be considered on various development scenarios and for various traffic alternatives.

Financial viability

Analysis of the financial feasibility of the location to determine the relative risk and incentives required in terms of operations and business, etc. to solve the risks that are identified.



Plan 2.2.4: Logistics Map of Turkey

This plan constitutes the final result of the effective combination of the previous three, the result of the Logistics Master Plan.

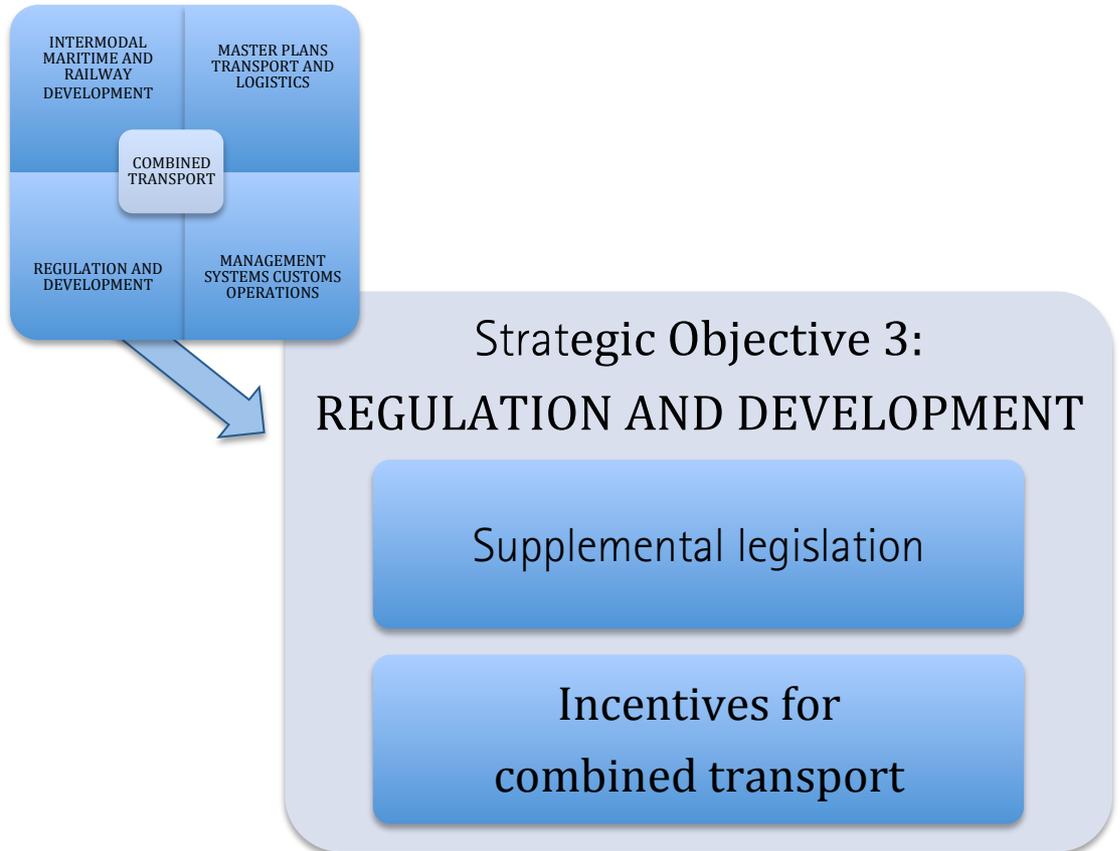
The logistics map involves the integration of transport infrastructures, production and consumption centres, combined transport corridors and logistics centre networks in a national offer of logistics services for national and international operators and producers.

The map must serve as justification for the opportunity detected for various logistics developments proposed in the country, since said developments will be the starting point for turning Turkey's comparative geo-strategic advantages into competitive advantages.

In short, the map will connect the logistics centres of Turkey designed in accordance with the method provided in the Master Plan, by means of combined transport corridors.

STRATEGIC OBJECTIVE 3: REGULATION AND DEVELOPMENT OF TURKISH COMBINED TRANSPORT

The operational actions embodying Strategic Objective 3 for the development of combined transport in Turkey are included in the following figure:



Graph 14 : Turkish Combined Transport Strategic Objective 3

STRATEGIC OBJECTIVE 3: REGULATION AND DEVELOPMENT OF COMBINED TRANSPORT

JUSTIFICATION:

As with Objective 4, this objective serves as a basis in order to achieve Objectives 1 and 2, the true keys to the Strategic Combined Transport Plan in Turkey.

Objective 3 is embodied in two environments:

- Definition of legislative measures supplemental to those regarding the Law on Combined Transport (does not include single window proposals, which comprise part of Strategic Objective 4).
- Definition of measures to develop combined transport.

STRATEGIC OBJECTIVE	PLAN OF ACTION	LINE OF ACTION
REGULATION AND PROMOTION OF COMBINED TRANSPORT	PLAN 3.1: SUPPLEMENTARY LEGISLATION	3.1.1.- Preparation of the Turkish Logistics Sector Law
		3.1.2.-Analysis of the feasibility of a single contract for combined transport
		3.1.3.-Start-up of the Permanent Combined Transport Platform
		3.1.4.- Analyse the feasibility of the application of arbitration cuts to settle issues
	PLAN 3.2: DEFINITION OF PROMOTION MEASURES	3.2.1: Creation of a Technical Commission for the study of Combined Transport incentives
		3.2.2.: Fomenting of public-private dialogue.

Table 6: Action plans and lines for Strategic Objective 3

Definition of supplemental legislation

The legal framework relating to worldwide multimodal transport operations is comprised of a large and heterogeneous set of legal and institutional instruments, for commercial uses and practices and courses of action regarding physical infrastructure whose objectives are:

- To provide flexibility for combined transport operation.
- To ensure free competition among operators.
- To facilitate commercial profitability through infrastructure productivity.
- To achieve economies of scale between production and logistics chains.

Beyond legislation regarding combined transport, there are numerous factors related to or directly interwoven with its operations that require their own legal development, such as the logistics sector.

International combined transport faces a complex reality, which includes:

- ✓ Access to the freight forwarder profession, permitting operation in multimodal transport; this is generically regulated, but not the activity as such.
- ✓ Tax and fiscal legislation often specifies tax exemptions for freight and service costs including those for land sections within the framework of international multimodal transport operations.
- ✓ Inland cargo terminals, dry ports and bonded warehouse variants have no regulations or technical provisions governing conditioning and transfer operations between different transport modes and stages.
- ✓ Banks and insurance companies have not defined a standard universal policy applicable to the acceptance of multimodal transport documents for the coverage and financing of intermodal operations.



The scope of Operational Objective 3 consists of the identification (and subsequent justification) of activities and situations related to combined transport, which would require legal development that favours development through providing coverage for that particular activity.

Definition of measures to develop combined transport

Historically speaking, economic policies for the development of transport infrastructure for a country are basically focused on its internal environment, while ignoring international aspects.

Globalization and consolidation of the European Union transport policies have shown, as reflected in the White Papers published by the European Commission, the need to develop a strategic plan of action for the common and comprehensive re-ordering of the transport community, ensuring sustainability and focus on intermodality.

The current environment is characterized by progressive geometric growth of freight traffic on road networks around the world. This circumstance goes against the aforementioned harmonizing principle.

However, the current situation of complete land transport dominance of transport networks, despite evidence of its negative impact on the economy and society, will continue, at least in the short and medium terms.

The projections are striking: in the year 2020, land freight transport will have increased by more than 70% in the European Union and 95% in the ten new member states, using 2012 as a base.

To prevent absolute dominance of land transport in the global transport sector, governments have proposed the formulation of different measures that pursue, develop and aim at intermodal re-balance, with the fundamental element always being the development of combined transport.

Additionally, to try to establish strict collaborative channels using private initiative by working jointly and through consensus among the different actors involved in the transport and logistics value chain.

For example, the European Union is committed to launching Short Sea Shipping routes as well as to the so-called Motorways of the Sea, as methods to alleviate roadway artery congestion. These initiatives (SSS, highways) are not limited to maritime-port activities, rather they have a comprehensive and inclusive approach enabling alignment of the entire transport network while strengthening land connections.

The key to the transfer of goods between modes is based on the development (including financial incentives) of intermodal logistic chains, which use transportation resources in a more rational and efficient manner throughout the entire supply chain, achieving a restructuring of the transport system and an improvement in external costs (those that affect society and are not borne directly by the user of the transport system, which has caused environmental, accident rate, congestion, etc. costs).

In this scenario it is necessary to review the impact of the incentive measures implemented for intermodal interchange, as well as to define other actions in accordance with the changing environment.

Measures to incentivise intermodal re-balance

From a technical and economic standpoint, there are two ways in which to act in order to achieve intermodal re-balance.

1.- Internalize costs, making transport users responsible for paying the whole of the costs that their use generates.

From this viewpoint, competition between modes is characterized by its "fairness", as the use of a transport mode would entail payment of all costs incurred by such use.

Despite the fairness of this approach, currently, there are distortions in the transport market as not all transport modes pay the same proportion as the costs they create; distortions that affect efficiency of the transport system.

Internalization of costs could greatly help achieve a more efficient transport system, as the modes with high external costs, such as land transport, would be penalized.

2.- Achieving intermodal re-balances indirectly through subsidies, tax measures, tariffs or incentives.

In other words, government actions that are designed to promote the use and development of the most sustainable modes.

The following analyses the effect of three incentive measures implemented by the European Union within the framework objective of indirect intermodal re-balance.

It should be noted that countries like Switzerland, Austria and Germany have also implemented the process of cost internalization.

The "Ecobono" (Econo-pass)

Of Italian origin, this is defined as an incentive offered by a public organism aimed at land transport carriers.

It aims to restructure the transport system in order to achieve a more efficient intermodal rebalance, while continually measuring efficiency in terms of external costs produced by the transport system.

To this end, it pursues and promotes the development of intermodal logistic chains, which use transportation resources in a more rational and efficient manner throughout the entire supply chain.

The Ecobono is feasible and profitable due to cost savings for the entire intermodal re-balancing in terms of external costs.

In short, the Ecobono is simply the return of part of the savings obtained.

The Italian Ecobono is an economic incentive program established by the Italian Government for those who load their transport trucks (complete road trains or semi-trailers) onto ships enrolled in SSS lines departing from Italian ports. The incentive is granted in the form of a freight discount.



The Ecobono is applicable if the following requirements are met:

1. Quota transfer consistent with road to sea transport must be encouraged.
2. The service must contribute to the reduction of congestion of the national road network.
3. The use of sea transport must provide a reduction of external costs.

It is intended that the modal shift stemming from the use of SSS lines will help alleviate road congestion while providing infrastructure maintenance for an area by reducing the ADT (Average Daily Traffic).

The Italian Ministry of Infrastructure and Transport has extended the Ecobono until 2017, in the model that ran from 2006-2011.

To this end, it shall reallocate 30 million euros in assistance over a period of five years for road transport companies using Short Sea Shipping lines to Italy.

The latest data released by Rete Autostrade Mediterranee (the official government body that manages the Italian Ecobono) indicates that a truck transported on an SSS line vessel costs on average **0.137 euros/km.**; a third of the price of the same route taken by land. 0.379 euros/km.

In the European Union, a very noticeable opinion trend has arisen recommending the adoption of the Italian Ecobono for the entire EU, with periodic review processes for the Marco Polo programme and the Trans-European Transport Network, discussed below.

Marco Polo II Programme

As with its predecessor (Marco Polo 1, 2003-2006), the Marco Polo II Programme functions as a financing instrument.

With a duration of 7 years (January 2007 to December 2013) the aim has been to implement a transfer of traffic, constituting a substantial part of the expected annual aggregate increase in international freight traffic by road (in tonnes/km) to other modes of transport such as Short Sea Shipping, rail, inland waterways or a combination of transport modes in which road transport is as short as possible.

In other words, to reduce congestion, improve environmental behaviour of the transport system and to enhance combined transport, thereby contributing to an efficient and sustainable transport system, while providing added value to Union European production lines, at the same time preventing adverse affects on economic, social or territorial cohesion.

Actions promoted by the Marco Polo II programme are classified into the following categories:

1. Catalytic measures; those aimed at improving synergies between transport modes (rail, inland waterways and maritime). Sectors with better use of existing infrastructure deserve special attention.
2. Highways of the sea measures
3. Combined transport mode measures
4. Traffic prevention measures
5. Common learning measures

The programme has funded measures in the territory of at least two Member States or those carried out in the territory of one Member State as well as in the territory of a nearby third country.



Projects must be submitted by a consortia of two or more companies established in at least two different Member States or in a Member State and a nearby third country, or, as a special circumstance, if it is a transport connection with a nearby third country, it may be presented by a company of a Member State.

Community financial assistance was provided under contracts negotiated between the Commission and the beneficiary, community support that did not prevent the granting of the same public grant measures at the national, regional or local levels, to the extent that said assistance is compatible with the State grant system established by the Treaty, and within the cumulative limits for each type of action.

Total aid granted in the form of State assistance as well as community financial assistance in relation to auxiliary infrastructure shall not exceed 50% of eligible costs.

Trans-European Transport Network (TEN-T)

Competitiveness of the EU economy, among other factors, is determined by available transport infrastructure.

The network has required major investment at the EU level for the implementation of major renovation or infrastructure generation projects, which enhance transport effectiveness and efficiency.

In general, community contribution to the development of the Trans-European Transport Network has focused on cross-border routes and congestion points.

Evaluation of 3 measures

The three incentive measures for a more sustainable intermodal re-balance with better cooperation in the European intermodal transport market have pursued a common goal in all three cases, although the paths chosen for their attainment are different.

Firstly, the Ecobono, in order to achieve its objective, subsidises SSS users by reimbursing them for part of the freight. It is, therefore, a direct measure for the user of a more environmentally sustainable transport mode.

Contrarily, the Marco Polo programme and the TEN -T project are not embodied in direct measures to users of the transport mode or modes to be strengthened, rather they finance the actions or projects focusing on the desired intermodal re-balance.

Another difference between the three measures studied is the agencies that fund them.

In the case of the Ecobono, the budget is provided by the State Government in the Italian case and by the Regional Government in the Basque example. Nevertheless, official Community bodies (EU) are the ones that finance both the Marco Polo programme as well as the TEN- T project.

From an economic standpoint, it is positive and effective that the same problem be addressed from different perspectives in order that the final result is achieved decisively, leaving no room for problems preventing attainment of the objective pursued.

All studied measures must be applied in a coordinated manner, thus preventing overlaps and inefficiencies stemming from unorganised and independent action.



Ship-owners consider the Ecobono system much more effective than the Marco Polo programme as it does not generate distortions with regard to competition while accelerating the modal shift process from road to sea much more effectively.

The Marco Polo programme was useful in its early days, when no routes existed between Italy and Spain, at the time of its entry into force. Now a dozen lines exist, operating from northern, central and southern Italy to Barcelona and Valencia.

Finally, special attention must be given in order that the measures adopted may never distort the market, in particular among transport modes other than road transport or within each alternative mode, to an extent that is contrary to common interest (more sustainable intermodal re-balancing).

Care should be taken to prevent said distortions in order that measures may contribute to transferring freight from road to alternative transport modes, rather than removing freight from Short Sea Shipping, rail and inland waterways.

PLAN 3.1: SUPPLEMENTAL LEGISLATION

The environment required for multimodal transport development in Turkey should be in line with the situation observed in the rest of the world and be comprised of a network of legal and institutional mechanisms, physical infrastructure and service networks making multimodal transport a competitive tool for users.

Multimodal transport requires user actions, operating companies and governments that may be grouped into three broad "regulatory" frameworks.

- **Institutional framework:**

This allows participants to operate with the necessary guarantees for the performance of their functions.

For users, this framework must allow fair access to a set of multimodal transportation services, along with their international competitors.

For operators, it is the set of rules and regulations that will allow them to invest and preserve their investment, make it profitable and afford a guarantee of free competition.

For governments, the institutional framework must be allowed to intervene for control purposes for overall compliance with existing standards.

- **Legal framework:**

Established by the Draft Law on Intermodal Transport in Turkey.

This is a commercial measure and adopts means to enhance activity in accordance with necessities.

- **Operational framework:**

Defines collaborative operator operation.

This is directly related to operator practices and uses, but also with the ability to operate either financial, commercial and physically.

The most suitable operational framework is one that enables combined transport operations as there exist equipment and areas suitable for storage and transfer, sufficient experience to schedule and carry out transfers from one mode to another, banks that accept multimodal transport documents, insurance companies that cover multimodal transport operators and operations, exporters and importers who are able to choose appropriate commercial terms and, in general, that all operators may intercommunicate via EDI.

The 3.1 Plan of the Strategic Combined Transport Plan in Turkey refers to the legal coverage of activities related to this mode of transport, which, if not executed properly, may condition its successful development.

Due to their actual nature, these activities have a different scope and approach and fall into the operational framework.

The Strategic Combined Transport Plan requires addressing the following courses of action:

3.1.1.- Development of Logistic Sector Legislation in Turkey.

Since the effective coordination of the Ministries involved in terms of competition, the law must pursue coverage of sector needs, facilitating operation for logistics operators as well as the creation of clusters in intermodal corridors.

To this end, the law must establish a clear definition of "logistics and its components" in order to achieve the agreement of institutions and private stakeholders.



The law must establish a comprehensive framework to regulate the construction and operation of inland terminals, in accordance with the technical guidelines established in the Logistics Master Plan; terminals able to carry out Customs clearance, which are able to perform all operations of conditioning, consolidation, deconsolidation and transfer of cargo, etc., necessary for transfer from one mode to another, or the collection and distribution of freight.

3.1.2.-Feasibility Study for a Single Combined Transport Contract

This line supposes a future revision of Turkish commercial law and if necessary, modification to include within the transport chapter information regarding the single combined transport contract, responding to the concerns of the private sector regarding the allocation of responsibilities.

This will reduce complaints regarding insecurity and costs of insurance premiums due to confusion with respect to liabilities.

3.1.3.- Commissioning of a Combined Transport Standing Platform

3.1.4.- Feasibility Study for the Application of Arbitration Courts in order to Resolve Combined Transport Problems

PLAN 3.2: DEFINITION OF MEASURES FOR THE DEVELOPMENT OF COMBINED TRANSPORT

The plan has complex objectives.

It is a case, on the one hand, of promoting the use of multimodal transport and, in this respect, of granting the same benefits to land freight when comprising part of a multimodal transport operation, as with air and maritime freight and, on the other hand, of not discriminating against any potential multimodal transport operators and of promoting the development of enterprises and national and regional consortia by providing incentives that encourage intermodal interchange, development of combined transport at the service of efficient logistics chains supporting production lines.

This plan is developed along the following action lines:

3.2.1: Creation of a Technical Commission for the Study of Combined Transport Incentives.

The purpose of this committee is to establish an institutional and operational framework for identifying incentives for intermodal re-balance in Turkey.

Participants:

- a) Ministry of Transport, Maritime Affairs and Communications
- b) Ministry of Customs and Trade
- c) Ministry of Economic Affairs
- d) Ministry of Environment and Urban Planning
- e) Ministry of Finance
- f) Ministry of Development

Coordination of this committee is the responsibility of the DG of Combined Transport of the Ministry of Transport.

Activities assigned to the Technical Commission for the Study of Incentives

They are as follows:

- Identification of incentives applicable to the reality of combined transport in Turkey.
- Monitoring of studies and analysis in order to determine the feasibility of the incentives identified.
- Presentation and discussion of incentive plans with the Combined Transport Standing Platform stakeholders.
- Formulation of legal development proposals for incentives for submission to the Council of Ministers.

Types of incentives to be studied by the Technical Commission

The field of study regarding incentives is very broad.

Due to the problematic experience of the European Union, it is recommended that in the first instance, analysis be carried out with respect to the feasibility of incentive programmes related to:

- supply of combined transport services
- demand for combined transport
- feasibility of an environmental tax rate for land transport in collaboration with the Ministry of Environment.



The economic crisis has supposed, paradoxically, a shot in the arm for the European transport system, which, despite the positive figures obtained in terms of traffic, remains dependent on road transport. Among all the alternative incentives assessed, the Ecobono has reached a key role in terms of the desired combined shift.

The profitability of the Ecobono is warranted on the grounds of the difference in external costs between maritime transport and land transport. However, for its implementation to be successful, it must adopt a Community approach, since its current diverse application does not permit full exploitation of its potential.

Additionally, it is essential to approach the problem of intermodal re-balance from a global standpoint in order to achieve satisfactory results.

Otherwise, regional or state incentive plans (Ecobono or similar) are configured as transitional measures in an inefficient continental scope.

3.2.2: Development of Public-Private Sector Dialogue

The creation of networks between government, industry, academic institutions and civil society organizations is an essential part of the vision for sustainable combined freight transport.

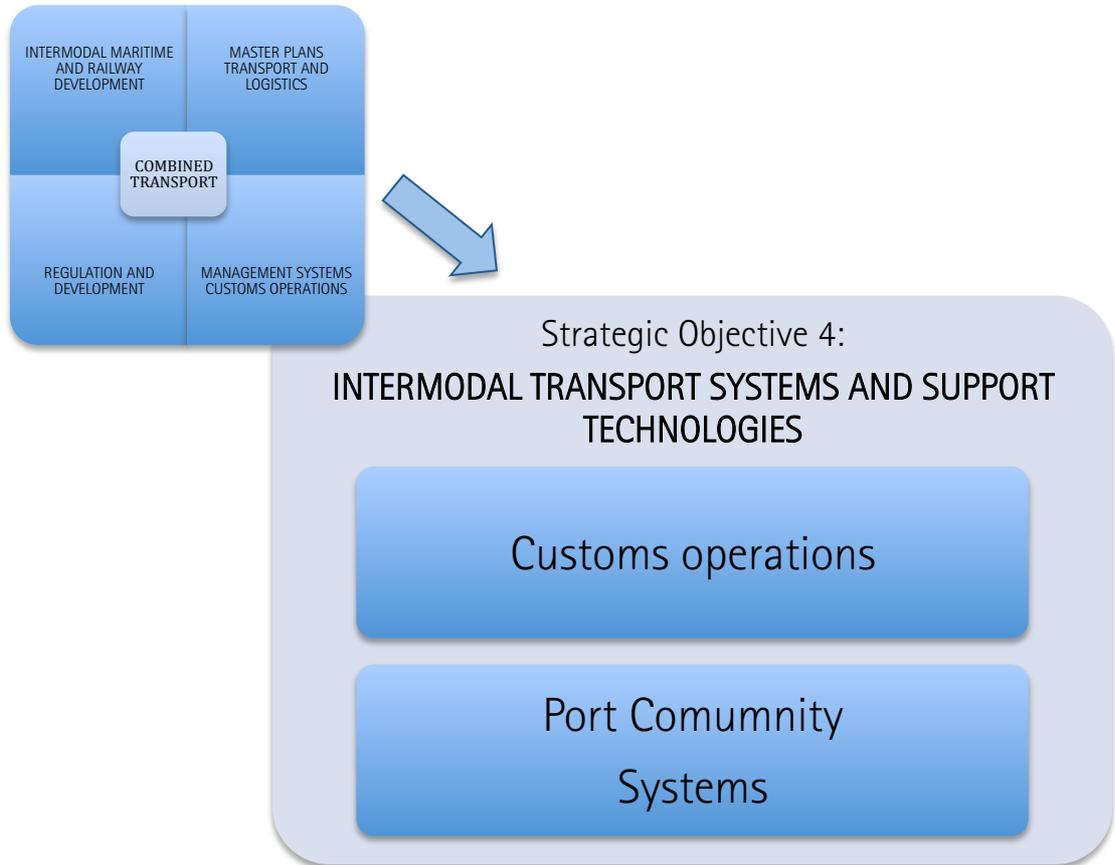
Public-Private Partnerships are essential, not only for the construction and maintenance of infrastructure, but also for the management of specialized services and research, by which establishing agreements between different actors is highly relevant.

To this end, workshops shall be offered with industry stakeholders convened by the Technical Commission for the Study of Combined Transport Incentives and coordinated by the Turkish Combined Transport Standing Platform, which shall focus on:

- ✓ generating consensus regarding applicability of incentives
- ✓ instrumentation and generation of efficiency in the application of incentives
- ✓ Monitoring of incentive performance

STRATEGIC OBJECTIVE 4: COMBINED TRANSPORT SYSTEMS AND SUPPORT TECHNOLOGIES

The operational aims covered by strategic objective 4 are indicated in the following diagram:



Graph 15 : Turkish Combined Transport Strategic Objective 4

STRATEGIC OBJECTIVE 4: COMBINED TRANSPORT SYSTEMS AND SUPPORT TECHNOLOGIES

JUSTIFICATION:

General view: the need for technology in combined transport chains

Combined transport requires the combining and integrating of different aspects related to the legal and regulatory environment, infrastructure quality, transport and logistics operation and customs management for its optimal development.

Technology plays a key role in improving the efficiency of the aforementioned aspects by facilitating their proper integrated application to achieve combined transport's strategic objectives.

Big transnational transport operators are designing and offering increasingly sophisticated multimodal services (complete traceability at all points on the chain, direct multichannel communication with the operator, day-to-day inventory management and reduction of operation times to a minimum at cross docks), which are transforming the customer relation model and tending towards cooperation and 'coo petition' among all the links in the multimodal chain.

The purpose of applying technological solutions to combined transport is to cover client needs with respect to the reliability, speed, efficiency and quality of the transport operation.

The complexity involved in integrating the monitoring requirements of the different modes of transport that form part of the combined operation, the interfaces required and the services provided under the sole responsibility of the operator, is being successfully tackled by means of the incorporation of technologies that make the effective performance of the intermodal chain possible.

The most contracted solutions internationally are "single window" ones for the customs operations and Port Community Systems to optimise the integrated sea transport chain and port operations and their integration into the combined transport operation.

These are the strategic objective 4 spheres of action, support systems and technologies for Turkey's combined transport development Strategic Plan.

STRATEGIC OBJECTIVE	PLAN OF ACTION	LINE OF ACTION
COMBINED TRANSPORT BACK-UP SYSTEMS AND TECHNOLOGIES	4.1: CUSTOMS PROCEDURES	4.1.1.- Define a mechanism of institutional cooperation for the definition and implementation of a single window
		4.1.2.- Bilateral Agreements with border countries
	4.2: PORT COMMUNITY SYSTEM	4.2.1.- Development of a Turkish Port Community System
		4.2.2.: Fomenting of public-private dialogue.

Table 7: Action plans and lines for Strategic Objective 4

Customs operations. Towards the single window

Improvements to the documentary procedures associated with goods' movement, especially in the import-export fields favours and stimulates international trade, the expansion of which in turn gives rise to improvements to procedures, thus generating a "virtuous circle" the main purpose of which is to reduce transport costs.

The duration of the import-export processes determines the exterior trade volume of countries.

On an international scale, the statistics show that for every **additional day** required by the export customs procedures and processes of a given country with respect to the international average, produces a 1% reduction in export volume.

If we interpret this in physical terms, the need for an additional day in a particular country to sort out customs processes equals an **85 km** increase in the distance between the exporter and the importer.

The impact is greater in the case of **time sensitive goods** (e.g. perishable products), amounting to a reduction of **7%**.

One of the negative factors in customs management is the **excessive documentation** required, which results in the increase of days needed for its processing.

THE NATIONAL SINGLE WINDOW

WHAT IS A NATIONAL SINGLE WINDOW

The concept of the National SW is to be found within the UNECE's paper 'Recommendation and Guidelines on establishing a SW'.

Within the context of this recommendation, a SW is defined as:

'a facility that allows parties involved in trade and transport to lodge standardised information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements.'

It is Government Service for presenting information and standardized documents through a single point of entry.

This is a philosophy of governance in which traditional structures of government are transformed into new arrangements that best serve the needs of citizens and businesses.

Under this approach, citizens and businesses would receive government services through a single interface to government.

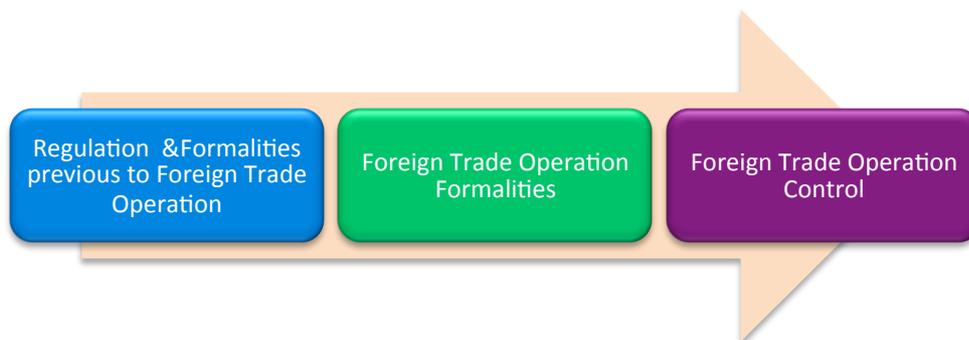


Image 15: Foreign Trade operations sequence

A Single Window Environment for Cross Border Trade shall consider interoperability among the customs management systems, cross border regulation compliance systems and public infrastructure management systems.

Besides, a Single Window Environment shall consider the effective communication with trade, transport and logistics management and collaboration systems in the business environment.

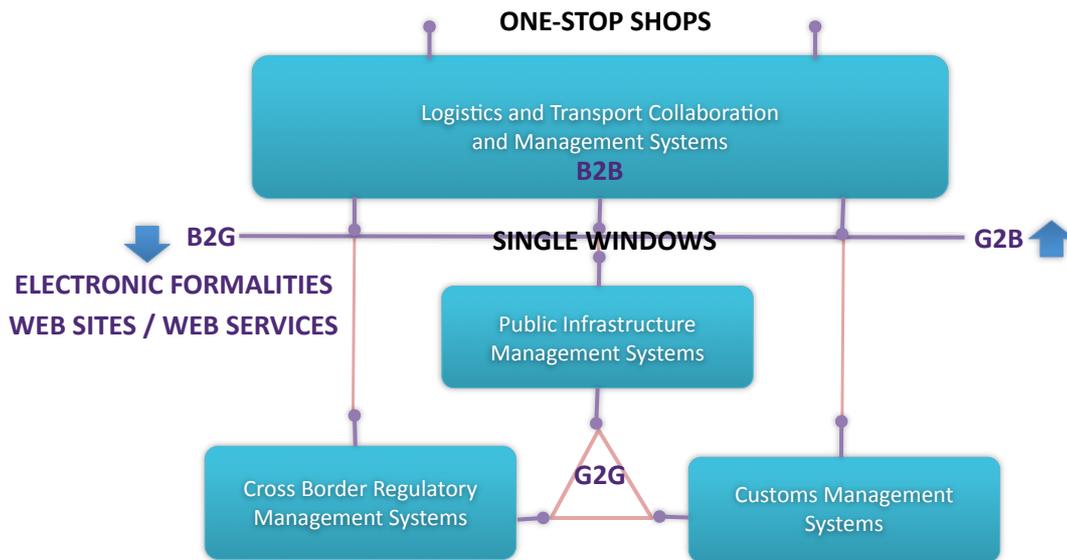


Image 16: Single window scope

In practical terms, the SW aims to expedite and simplify information flows between trade and Government and brings meaningful gains to all parties involved in cross-border trade.

It is further recommended to restrict the concept of a 'National SW' to the subject areas:

- ✓ Government to Government (G2G): 'Data exchange among government agencies', and
- ✓ Business to Government (B2G) – 'Data exchange between the private sector and government agencies'.

Business-to-business data flows (B2B) clearly must stay out of the National Window scope, due to more complex communication flows (many-to-many as opposed to many-to-one), and in order to assure swift and efficient adaption to the major global trade challenges.

The SW is generally managed centrally by a lead agency, which could be a governmental organisation, private entity (such as a Chamber of Commerce) or public-private partnership.

Whatever the nature of the lead agency, UNECE clearly recommends to proceed with the setting up of a SW facility at the national level through a collaborative effort with all relevant governmental authorities and the business community.

OBJECTIVES OF A SINGLE WINDOW

A National Single Window should accomplish the following objectives:

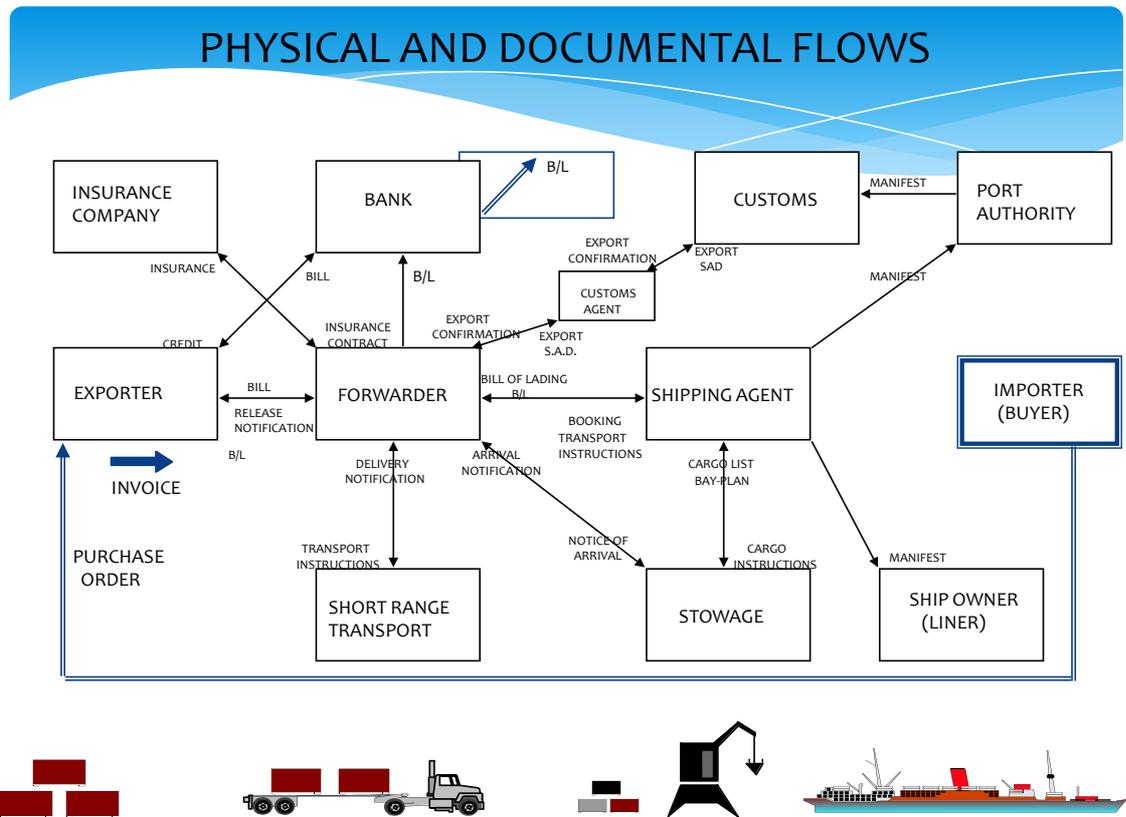
- Introducing new methods for simplifying customs formalities for carrying goods by sea, rail and truck.
- Increasing the level of security and safety in ports and land borders by introducing the control of operations and facilitating the detection of inconsistencies.
- Taking full advantage of the information existing on customs procedures life cycles that affect freight and containers stored in the port facilities (container and rail terminals, warehouses, free zones and other areas of temporary storage).
- Combining customs traceability information with other port and rail traceability sources of information to provide higher added services both for governmental and commercial purposes.

- Introducing greater efficiencies and benefits for the transport system. For example, reducing congestion and delays, resource intensive labour, increased customer satisfaction and major competitive positioning of the transport market.

DEFINING A SINGLE WINDOW: THE SPANISH CASE

According to Spanish experience the key points for defining a single window system are:

- ✓ design an architecture that reflects the relationships between all project partners, necessary information flows, the detail of the rules to change and one win win schema.
- ✓ design a functionality that provides benefits to all participants, allowing its voluntary deployment and avoiding that a justified economic resistance to implementation could appear.



Graph 16: Physical and documental flows

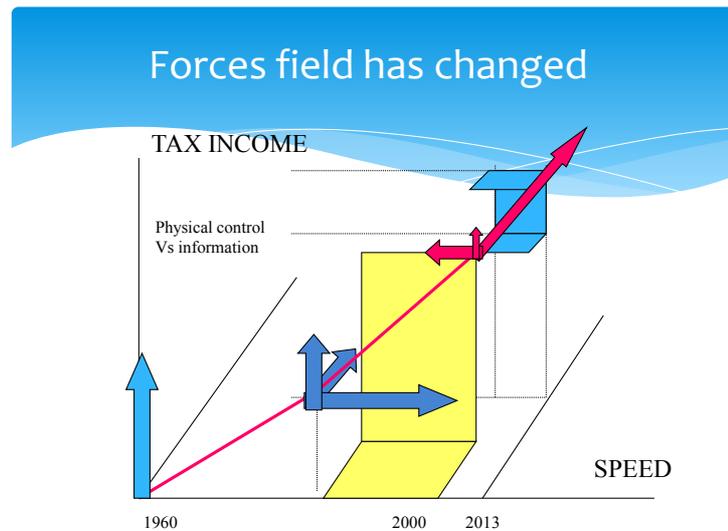
Twenty years ago, ports and combined transport nodes competed in an open market.

Customs assumed that they should enhance the speed in order to increase the flow of trade in specific places.

After September 2001 attacks, the forces field switches back increasing the need to share information, not only with other customs but also with the security forces.

The speed imperative was reduced because the market accepted the need for new controls, scanners, radioactivity and others.

These forces are expressed in the following graph:



Graph 17: Field of forces in customs

Turkey should decide whether the implementation process of a single window starts or not in maritime premises.

At Spain, the single window was initiated in ports, as 82% of the import goods used this type of transport. After, airports, road transport and railways were incorporated to the system.

In the case of Turkey, due to the increasing importance of railways, the decision about deployment has to be carefully analysed.

Once the priority has been decided, it should be defined the data flow between institutions in detail.

At Spain, the information shared between customs and ports were an 80% of the total.

It should be considered that the inevitable exchange of personal data could be exhibited as a weapon against the system, changing procedures when necessary or designing a system of voluntary adhesion to the system.

It is critical to differentiate aspects of technology standards from information structure. There are very different aspects of flow messages.

Nowadays XML based solution adopted by Turkey seems correct. However, these messages may contain information with EDIFACT structure encapsulated in different ways.

The Basis of Spanish experience has this basis:

- EDI as a strategic tool.
- Without gifts. Optional use of services provided.
- Common benefits.
- Only one language and only one grammar
- Many networks. Several protocols.
- Single Window.
- Only one systems (Integrated with AEAT)

It is proposed as an analytical tool based on the concept of Porter's **value chain**.

There are several processes that take place in a customs area:

- ✓ acceptance of the summary declaration,
- ✓ acceptance of the SAD, dated goods,
- ✓ risk analysis,
- ✓ assessment of duties...

All of them are part of a legal process that must be performed according to an established procedure and accessing data bases created by EU institutions, such as the TARIC and QUOTA.

Products generated are:

- ✓ release of goods,
- ✓ revenue for the national budget and community and
- ✓ various statistics and balance control.

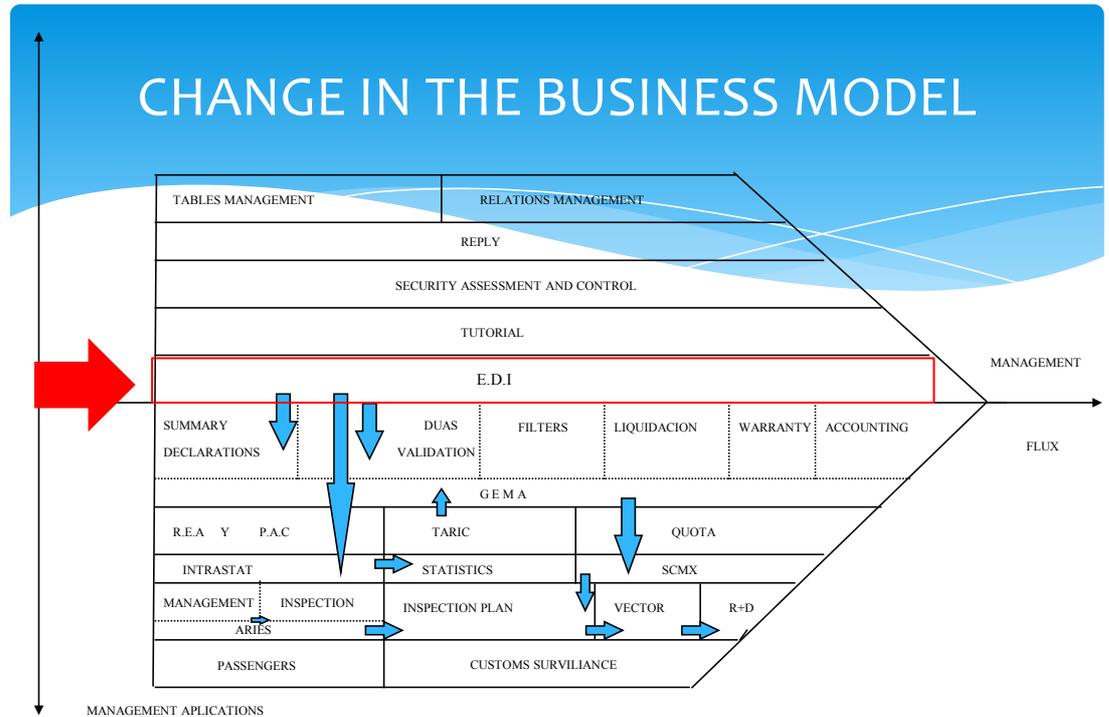


Image 17: Customs operations in a value chain

It is important to design a very abstract layer, so that applications can be isolated from technology changes and the procedures.

Afterwards various technical elements relating to this layer, protocols, service levels, access to networks and special treatments as the translation of messages were exposed.

Other functions that must be supported by customs while facilitating combined transport in a single window system are the following:

1. Control of containers to prevent smuggling, drug trafficking and other crimes.
2. Ensure vertical compatibility. It implies that system partners should consistently maintain the value of their technology investments when making the necessary adjustments in the system.
3. It was shown that in the past a 100% of customs control was made at the borders. Creation of new institutions has produced that only a 3% of the sites controlled by customs are currently placed at the borders.
4. The risk analysis leads goods to circuits, red, orange or green. The red circuit involves physical examination; orange documentary control and green immediate clearance.
5. Information system architecture must allow full granularity in the application of risk analysis.

INTEGRATION WITH OTHER INSTITUTIONS

Turkish authorities have to decide between a unique single-window or one federated system of single-windows, in order to support an efficient management of combined transport.

First, it is necessary to analyse the real wish for a single window. Should it be defined as a system where a single institution in a single computer receives data from all parts involved and manages in a single system combined transport? or should it be better a federated system in which each institution, ports, airports, customs, is the centre for their natural users, and all of them would be joint in a single window that could federate with e-govern projects in a hierarchical way?

There is a very important decision and experts recalled, giving the example of the specialization of labour conceived by Adam Smith as implemented nowadays in factories, that although "unique" concept has a philosophical appeal, the existence of a single system does not mean that all participants must perform the same tasks and only one institution must provide full support in only one place.

Then other subsystems were studied. Dangerous goods, berthing and multiple examples of the Being the creation of a single window Customs Ministry responsibility, its advisable to put in place these recommendations:

- Thorough understanding and documenting this unique concept, considering that there will be a federation inevitably subsystems.
- Each sub-system should be as simple as possible
- Standards must be agreed
- Being very important Customs role, the focus should never be placed in an only institution. The principal actor is the customer, the final user of combined transport.

THE MARITIME PART OF THE NATIONAL SINGLE WINDOW

Ports are the most important borders of many countries and the main gateways for international freight flows.

Characteristics

- To integrate into a single procedure all the formalities required from the consignee of the vessel by the Port Authorities and Harbour Master Office
- Electronic Data Interchange
 - The electronic transmission through interchange agreements or digital signatures has the same legal effects than a paper signed document.

- Focus on the procedures and not on the systems: interfaces, role and competences of each administrations, legal basis, information flows and data specifications.
- Single Call Document
 - Vessel Port Call Management → Port Authority (Port Administration)
 - Vessel Clearance → Port Harbour Master Office (Maritime Administration)
 - Beginning of National Customs Control → Customs Department (Tributary Agency)

PORT COMMUNITY SYSTEMS

According to the EPCSA (European Port Community Systems Association) a Port Community System is:

"A neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders in order to improve the competitive position of the sea and air ports' communities; optimises, manages and automates port and logistics efficient processes through a single submission of data and connecting transport and logistics chains".

A Port Community System is a technological platform that provides services designed to streamline and facilitate the operating processes of companies of the port community.

Efficient information management is a key factor of the competitiveness of any company involved in transportation due to the vast quantities of information created and interchanged.

Through this kind of platforms ports provides logistics agents with a collaborative instrument for them to offer their customers a better service, helping them thereby to become more competitive whilst allowing them to capture and increase cargo loyalty thanks to improvements in the following areas:

- **Efficiency:** automated operations by adopting error-free paperless processes
- **Connectivity:** connecting port agents dealing with critical business processes
- **Integration:** integration of sea-port-land operations between ports, ocean carriers and their shipping agents, freight forwarders and other operators
- **Modernization:** modernizing logistics management by connecting agents' systems and using the most advanced information systems.

Users are the core of a Port Community System.

Port Community System Operators (PCSO) are trusted third parties. Some are 100% publicly owned; some are private-public partnerships; others are privately owned.

The range of PCS key stakeholders consists of private companies on the one hand (shipping agents, terminal operators, forwarders, Customs brokers, etc.) and of public or government agencies – Customs or Port Authorities, for example – on the other hand.

In terms of the client structure, shipping lines and freight forwarders play the most important role, followed by importers and exporters in general or Customs and shipping agents.

The number of clients differs, with most of them being importers or exporters, forwarders, terminals, on-carriage operators, ship agencies or brokers.

There are the following Types of Port Community Systems:

Target (Users/Customers)	Business Model	Operation Model	Services
Port Operators	Fully Private	Fully Private	Extension of TOS
Authorities:			
Port Authority			
Customs			
Harbour Master	Mixed	Mixed	Wide Range
Coast Guard			
Inmigration	Local / Port Authorities	Public Authorities	B2G / Single Window
Sanitary Inspection ...			
Shipping Lines	National Authorities		
Line Agents			
NVOCC			
Container Terminals			
Container Depots			
Road /Rail / River Operators			
Forwarders			
Logistic Operators			
Inland Terminals			
Customs Brokers			
Shippers			

Cuadro 1: Port Community Systems typologies

PORT COMMUNITY SYSTEMS AS CLEARING CENTRES

In the business processes of port and maritime logistics, the Port Community System are well established, which means that they already have active interfaces with most of the carriers, terminals, local and national authorities.

Today, a significant amount of maritime trade data is communicated via Port Community System.

The Port Community System is able to adapt the set of data into messages that are required by Single Window within a state.

The clearing centre function means:

- ✓ receiving messages, processing data according to requirements and
- ✓ forwarding messages to the stakeholders and to the authorities or to a SW.

The main advantages of Port Community System acting as clearing centres are:

- Avoid double input/notifications by the stakeholders;
- Possible further use of existing information technology infrastructure in the ports and government, i.e. no additional investments in new infrastructure;

- Additional process optimisation in the ports by increasing the transparency for the maritime parties. For instance, enhancing the competitiveness of port and maritime logistics through the efficient electronic exchange of information; and
- Respect the confidentiality of the process actors. i.e. Port Community System acts as a trusted third party.

Integration of PCS and National SW as a "Gateway to a 'National Single Window'"

The 'Gateway to a National SW' consists of both the community systems (for maritime freight and air freight) and the central government system. In order to support the objectives of a National SW, the Gateway to a SW consists of a purely public section (NSW) and a public-private section (PCS).

The schematic overview of the different systems and how they are integrated is shown below.

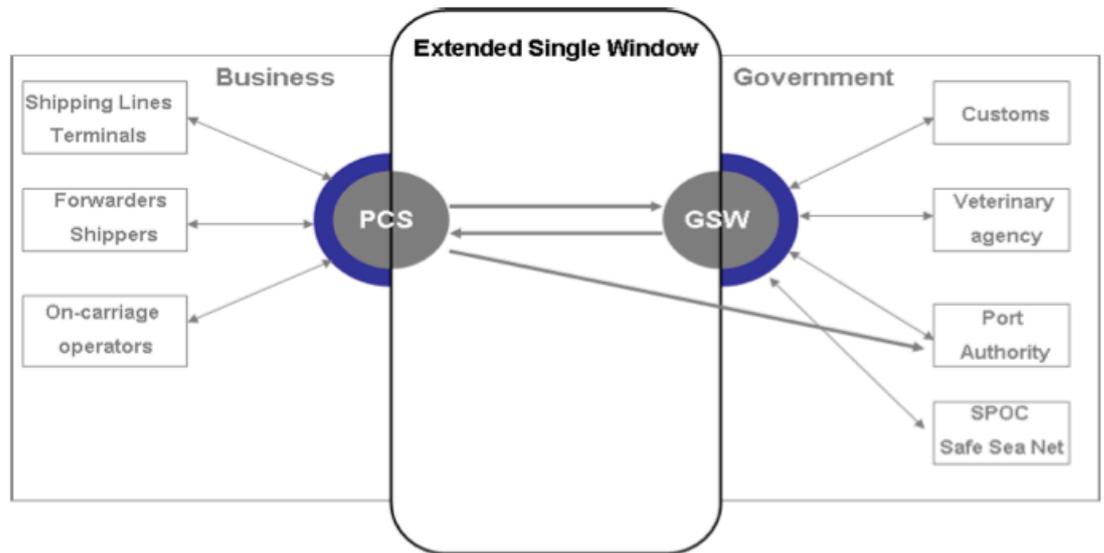


Image 18: Systems integration proposal

Integration of PCS and National Single Window

Integration between PCSs and the National SW can create optimal benefits for all stakeholders involved.

PCS could form the 'Gateway to a National SW' where the objectives of Government, business and ports are realised.

The definition of 'gateway' also indicates that the physical border is no longer that important.

For example, the physical gate can be extended to another air, sea or inland port and Customs procedures can be performed before exiting that gate and therefore acting in a national framework

The PCS collects all vessel and manifest information for both import and export flows from the shipping lines.

The information needs to be sent (or input via web-based data entry) only once for all declarations. Based on this information, all declarations can be sent towards Customs, harbour master and other Government agencies.

The PCS supports:



- ✓ vessel notification towards harbour master/Port Authority and Customs;
- ✓ cargo declaration, manifest filling/summary declaration towards Customs;
- ✓ ship's stores declaration; crew's effects declaration;
- ✓ dangerous goods declaration towards the harbour master/Port Authority.

Government agencies do not have the ability in many cases to receive data electronically for example crew lists and passenger lists can not currently be received electronically by most Government agencies. Waste disposal and port dues declarations can also be sent electronically towards the harbourmaster/Port Authority based on the same information.

Also, declarations towards the veterinary agency can be sent. In the same way, Governments send all their reply information back via the PCS to the business community.

At the same time, the business community can re-use the information already stored in the PCS for business-to-business purposes such as discharge lists, informing shippers and forwarders of the arrival and departure of their cargo, etc.

This ensures data integrity not only towards Governments, but also in the business area and vice versa.



PLAN 4.1: CUSTOMS OPERATIONS

The adaptation and harmonisation of the administrative procedures defined and implemented by customs authorities for combined transport is a key factor in developing this transport mode.

Internationally, current private stakeholder theory is that customs procedures allow for the selection of place and time of shipment and, as far as possible, lay down the operations required to facilitate the passage of containers to their end destination.

That is to say, getting containers through the port and/or borders in general without any physical inspection of the goods, thus enabling shipment to destination in storage at the particular customs depot or some other form of re-shipment to inland loading terminals as long as the container and seals arrive intact.

On the other hand, given the current global setting, the international integration of transport chains and logistics demands the adoption of an international vision of customs transit.

Plan 4.1. is proposed to be developed with the following action lines:

4.1.1.- To define an institutional cooperation mechanism to define and implement a single window for Turkey

Turkey needs to decide whether its objective with respect to the single window consists of creating a window exclusively for the sea-port sector, for customs or for combined transport, or the idea is to implement the models there that have been successfully established in Europe: the sea single window and the customs single window.

The design and implementation of the single window corresponds to the Ministry of Trade and Customs.

Given the complexity of this system, it is proposed to create a technical commission with the Ministries of Transport and Economy, presided over by Customs, to define the scope and functionality of the system.

4.1.2.- Bilateral agreements with border countries

The Ministry of Transport has to promote, in collaboration with the Ministries of Customs and Economy, bilateral agreements with border countries to facilitate processes and improve the infrastructures at particular transit points.

The purpose of these agreements as regards administrative processes is to harmonise customs administrative procedures and to analyse other trade practices in general (basically banking and insurance ones) that disrupt the continuous flow of international freight, thus restricting the development of multimodal transport.

One of the most complex aspects to overcome the barriers that can restrict combined transport lies in the lack of regional legal institutionally to cover all the stakeholders and activities involved in the physical distribution chains and which creates the conditions required to stimulate the setting-up of multimodal transport operators capable of organising efficient origin to destination distribution systems that enables them to compete, or at least collaborate in an increasingly, transnationalised multimodal business.

PLAN 4.2: PORT COMMUNITY SYSTEM

This plan aim consists of defining Port Community Systems role as Turkey moves towards the Single Window concept.

Most of the Turkish ports and terminals have their own systems to communicate with their clients and users.

That means the beginning of a Port Community System: all carriers are sending digitally their operations information.

In the business processes of port logistics, the Port Community Systems are well established, which means that they already have active interfaces with most of the carriers, terminals and local authorities.

A significant part of the messages of the reporting formalities in a Single Window is already communicated via the Port Community Systems.

Based on the current situation in the major seaports, it's really advisable that the Port Community Systems should take over the function of a clearing centre what it means:

- receiving messages,
- processing data in accordance with the requirements and
- forward the messages to the stakeholders and to the authorities or to a single window to be named.

The advantages of Port Community Systems acting as clearing centre are:

- ✓ They can act as Clearing Centres/Gateways to National Single Window through the efficient reuse of existing information.
- ✓ Information that currently exists in electronic format should not have to be duplicated due to a new law, instead, this new law should allow the information to be reused in order to avoid duplication of submission of data.
- ✓ Adherence should be made to internationally accepted standards which are in common use and thus avoiding additional burdens on the trade to develop their systems to handle newly created messages for single purpose use.
- ✓ PCS use these messages and reformulate them to the required format of their stakeholder, using EDI, thus avoiding the development of new IT systems and ensuring an efficient and cost effective use of existing data.

Plan 4.2. is proposed to be developed with the following action lines:

4.2.1.- Development of a Turkish Port Community System

The System can adopt a dimension national or local for each port to connect to the National Single Window.

Ports D.G. Transport Ministry will be in charge of the studies necessary to put in place a PCS for Turkish operators.

4.2.2.- Legislative proposals related to Single Window

It's necessary to follow **directive 2010/65/EU** on reporting formalities for ships arriving in and/or departing from ports, for the development and implementation of new regulation on Turkish Single Window.



This implies to accept certain standardised forms (FAL forms) in order to facilitate traffic, as defined by the International Maritime Organisation (IMO) Convention on Facilitation of International Maritime Traffic (FAL Convention), adopted on 9 April 1965.

These new laws should be the fundamental objective, beyond the control of borders, the facilitation of maritime transport and in order to reduce the administrative burdens for shipping companies, the reporting formalities required by legal acts of the Country need to be simplified and harmonised to the greatest extent possible.

However, these laws should not introduce any additional reporting requirements for ships not already under such obligation according to legislation applicable in Turkey.

It should deal solely with how the information procedures can be simplified and harmonised, and how the information could be gathered more effectively.

In view of the global dimension of maritime transport, legal acts of the Union must take account of IMO requirements if simplification is to take place.

Although it is clearly stated that the competent body for Single Window regulation is the Ministry of Customs and Trade, we recommend follow directive 2010/65/EU on these points:

- Regulators should deepen the cooperation between the competent authorities, such as their customs, border control, public health and transport authorities in order to continue to simplify and harmonise reporting formalities within the Union and make the most efficient use of electronic data transmission and information exchange systems, with a view to the, as far as possible, simultaneous elimination of barriers to maritime transport.
- Parties involved in trade and transport should be able to lodge standardised information and documents via an electronic single window to fulfil reporting formalities. Individual data elements should only be submitted once.
- Establish a Safe Sea Net like system to facilitate the reception, exchange and distribution of information between the information systems of the Country on maritime and transport activity.
- The system should be used for additional exchange of information for the facilitation of maritime transport.
- The full benefits of electronic data transmission can only be achieved where there is smooth and effective communication between Safe Sea Net like System, e-Customs and the electronic systems for entering or calling up data.
- To that end, in order to limit the administrative burdens, recourse should be had in the first instance to the applicable standards.
- Use of FAL forms: FAL forms are regularly updated.
- New law should therefore refer to the version of these forms that is currently in force. Any information required by Country's legislation which goes beyond FAL Convention requirements should be communicated in a format to be developed on the basis of FAL Convention standards.

ANNEXES

ANNEX 1: PRESENTATION OF SPANISH STATISTICAL TOOLS APPLICABLE TO THE TURKISH TRANSPORT SYSTEM

ENCUESTA PERMANENTE DE TRANSPORTE DE MERCANCÍAS POR CARRETERA (EPTMC) - PERMANENT SURVEY ON ROAD FREIGHT TRANSPORT

The *Encuesta Permanente de Transporte de Mercancías por Carretera (EPTMC) - Permanent Survey on Road Freight Transport* issued by the Spanish Ministry of Transport presents the flows of road freight transport on Spanish roads in compliance with the European Union requirements ((EC) Council regulation no. 1172/98 of 25 May 1998). The objectives of the EPTMC are: to gather information on the Spanish heavy vehicles transport operations; to get a price associated with public transport operations and to satisfy the information needs of the sector including the needs of government, carriers and users.

The main areas of research that can be highlighted are:

1. Population Scope

The population under study is all heavy goods vehicles registered in Spain authorised to transport freight by road that is:

- The tractor needs to be able to drag over 3.5 tonnes
- The rigid vehicles or trucks must have a payload capacity over 3.5 tonnes and an allowed maximum weight exceeding 6 tonnes.

Excluded: vehicles used in different freight transport: excavators, cranes, trawl basket or deed, crushers, bulldozers, fire trucks, snow plows, tractors, military vehicles and civilian administration vehicles, etc..

2. Territorial Scope

All operations performed by Spanish HGVs in Spanish territory as well as abroad are surveyed. Since 2002, the project also includes origin and destination operations from the same town (transport within municipalities).

Excluded: journeys made within a workplace (factory, construction site, etc..).

3. Temporal Scope

The temporary unit of information is the week and the information is obtained continuously during all the weeks of the year.



All journeys are collected, loaded or empty, initiated in the reference week assigned to the vehicle, even if they finish after the reference week, or contain operations that have started in the week after (considered as Sunday-Saturday). All journey operations are assigned to the same month, which coincides with the start of the first operation.

4. Exploitation of results

Exploitation of results is done for each calendar quarter. Quarterly data are disseminated two months after the end of the period, according to the following timing:

- Data quarter I → end of May
- Data quarter II → end of August
- Data quarter III → end of November
- Data quarter IV → end of February

5. Unit of observation

The unit of observation is the vehicle-week, specifically, all operations performed by the selected vehicle during the selected week.

6. The reporting unit

The reporting unit is the company that owns the selected vehicle and the information obtained is: vehicle characteristics, transported goods, origin, destination and distance of the operation and, where applicable, the price of the service.

7. Performance of the work

The technical management of the Permanent Survey on Road Freight Transport corresponds to the Directorate General of Economic Research and Statistics of the Ministry of Public Works. The contractor performs:

- a) debugging operations of the sampling frame and updating of the registry that acts as the base for the sample
- b) fieldwork: documentation mailing, collecting information (debugging, coding and validation)
- c) tabulation of information.

DEFINITIONS OF THE KEY VARIABLES OF THE DATABASE

Transport operation: Moving a single type of goods from the place of origin where they are loaded to the place of destination where they are unloaded. A load displacement with two different goods is considered as two separate operations.

- * Each partial loading or unloading of goods is the beginning or the end, respectively, of a transport operation.
- * Transport of empties → a transport operation performed by the empty heavy vehicle without load between the place where the previous freight was discharged and the following loading of freight.

Transport vehicle: Road transport heavy-duty vehicle fitted with an engine that derives its sole means of propulsion, designed exclusively or principally for the carriage of goods or to tow vehicles used for transporting freight.

Vehicle Capacity: the weight of goods allowed by the competent authority to be loaded into a vehicle.

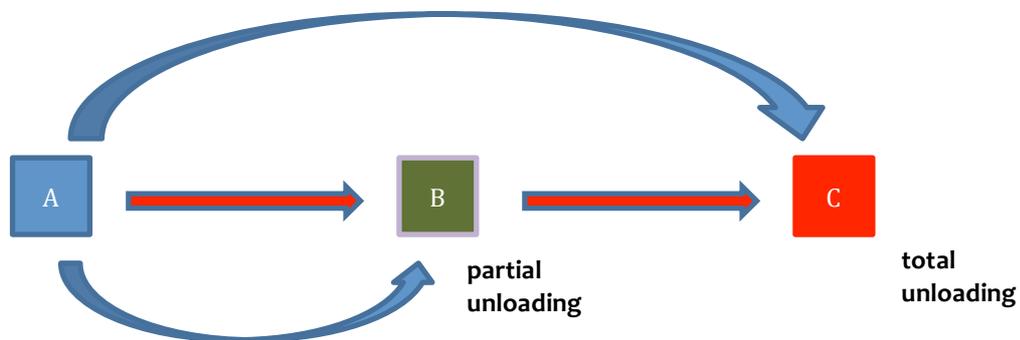
Type of service:

Private transport service: The vehicle is used exclusively to transport freight but the transport service is not paid. The vehicle belongs to the holder of the authorisation and is used to transport their own goods.

Public transport or for the account of others: The vehicle is used to transport by road goods belonging to a customer and the transport service will be paid by the customer.

Journey & stages

- * ***Journey:*** Transport operation between first origin and final destination of the whole trip.
- * ***Stage:*** part of the journey between two consecutive points where the vehicle will stop to be partially loaded or unloaded.



Journeys: 1 – Operations: 2 – Stages: 2

Journeys: AC ; Operations: AB,AC; Stage: AB, BC

Graph 18: Journeys, operations and stages according to the permanent survey

Operations can be classified as follows according to the relationship between places of origin and destination:

- within the municipality
- within a regional department
- interregional
- international



Goods transported: the movable goods carried from one place to another. When a vehicle carries two classes of different goods it is considered that it performs two transport operations.

For the purposes of the exploitation of this survey, the goods carried are grouped into ten groups:

0. Agricultural products and live animals
1. Food and forages
2. Solid mineral fuels
3. Petroleum products
4. Minerals and waste to recast
5. Metallurgical products
6. Mineral unworked or manufactured and building materials
7. Fertilizers
8. Chemical products
9. Machinery, vehicles, manufactured objects and special transactions

Tonnes transported: gross weight of the goods transported in each operation including the weight of the transported goods and the weight of the packaging and container.

Operation distance: for normal transport and shuttle: travelled distance by road between the point of loading and unloading. For the collection and distribution mode: travelled distance all the way from the point from where the vehicle is loaded until the last point where the vehicle will fully discharge the goods. For empty transport: distance travelled between the place where the vehicle was last unloaded to the place where the vehicle will be loaded again.

Tonnes-kilometres: For each operation = Tonnes transported x kilometres travelled.

In collection and distribution transport operations, this indicator is estimated as follows: Tonnes-kilometres: Tonnes transported x kilometres travelled / 2

COLLECTION OF INFORMATION

The information collection is done initially by post but there are other possibilities for collection: telephone, fax, email or by Internet.

In the second phase, it is collected by phone, using a Computer-Assisted Interviewing Telephone (CATI) system. This process is recommended because it reduces errors.

Personal interviews at the headquarters of the company owning the vehicle selected can also be used in exceptional cases.

The telephone support

The phone support is crucial to compile data and then to check, debug and validate them.

Localisation of the informants

The initial population database is intensively checked in order to make sure that companies no longer operating are excluded from it and that other errors are corrected. This intensive work is essential to ensure that the survey and other documentation (presentation of the rules to fill in the questionnaire, for instance) arrive to the informant.

Control of incidents

Strict control of incidents that occur during the field work takes place with the objective of limiting "failure to reply" cases to the maximum.

The response rate

The response rate in 2011 was 72.2%.

INFORMATION PROCESSING

Obtaining information

The final information is obtained through three sources:

- * The population frame from where we obtain the fundamental characteristics of vehicles and the information necessary for the selection and elevation of the sample.
- * The survey with information from vehicles and transport operations.
- * Internal work obtaining information, usually through the application of computer procedures and on special occasions by case analysis of the available information.

Control process in all work phases

It is necessary to carry out an exhaustive control process in all work phases due to difficulties to measure some of the key concepts of the survey, for example, transport operations.

Debug processes

A manual debugging process is performed with the objective of checking a set of rules of consistency and completeness of data.

Coding of questionnaires and recording

Automatic controls with ranges of values, rules for data and rules of relations between them are employed in this phase.

Automatic controls: validation

Finally, a full validation computerised process is performed in order to review the structure and consistency of the information. There are currently 400 different controls defined.

SAMPLE DESIGN AND ELEVATION OF RESULTS

Sampling unit

A stratified random sampling procedure using the vehicle / week as the sampling unit is carried out.

The selection frame

The selection frame is the registry file of heavy vehicles authorised for road freight transport issued by the Directorate General of Land Transport of the Spanish Ministry of Public Works.

Sample selection

Before the sample is selected, all the vehicles in the registry file that have already been selected in the previous six months are deleted in order to avoid asking repeatedly about the same vehicle to the same company (this is a measure to prevent companies from getting tired of replying the same questionnaire too often).

The sample units for each stratum are selected by systematic sampling with random start. Previously the units have been ordered according to autonomous region of vehicle registration.

Stratification criteria: type of service and type of vehicle and load capacity: Trucks from 3.6 t to 10 t; Trucks from 10.1 to 13.5 t; Trucks over 13.5 t

Samples are selected independently for each of the weeks of the year, at a rate of 1,000 vehicles per week.

Estimation of results

The process of estimating population results is performed for each complete period of four or five weeks of each month.

Elevation of analysis variables

Elevation of the analysis variables (operations, tonnes and tonnes km): a stratified expansion estimator is calculated.

Estimates

The estimates are calculated for each stratum. The total population is the sum of the estimates for each stratum.



PRINCIPAL RESULTS

- Kilometres
- Tonnes transported
- Tonnes -Kilometres
- Total transport, within municipalities, intercity and international
- Regional flows
- Type of goods transported

**OBSERVATORIO DE COSTES DEL TRANSPORTE POR CARRETERA –
OBSERVATORY OF ROAD FREIGHT TRANSPORT COSTS**

The *Observatory of road freight transport costs* created under the auspices of the General Direction on inland transport of the Spanish Ministry of Public Works, aims at becoming a tool to provide relevant information to main stakeholders in the process of fixing the economic terms of the transport contracts. It is regulated by the *RD 1225/2006, de 27 de octubre, por el que se modifica el Reglamento de la Ley de Ordenación de los Transportes Terrestres*.

The objective of the Observatory is not establishing fares for road transport of goods but creating a set of objective indicators that could be employed as input in the price determination process by transport companies. This information is especially relevant in the road transport sector in Spain as it is very much atomised (thousands of small companies operating) and there are many companies adding up to an important level of activity that do not have any information on their own operating costs and apply no specific accounting process to set up the price for the transport services they offer. This tool aims at improving transparency and guiding the price determination processing the sector.

The observatory includes an analysis of the average costs per type vehicle classified in several categories according to the vehicle characteristics. It is updated biannually since 2008.

OBSERVATORIO HISPANO-FRANCÉS DE TRÁFICO EN LOS PIRINEOS (OTP) – FRENCH-SPANISH OBSERVATORY OF TRANSPYRENEAN TRAFFIC

The *Observatorio Hispano-Francés de Tráfico en los Pirineos (OTP)* is a bi-national tool, created by the Ministries of Transport in France and Spain that aims at quantifying and monitoring the evolution of existing flows through the Pyrenees border. The operational objective focuses on the elaboration of a database compiling trans-border flows, including freight and passengers. Since its beginning in 1998, the OTP has confirmed its accuracy as a statistical instrument to analyse the transport flows between the Iberian Peninsula and the rest of Europe. The OTP periodic publications cover four main topics: economic and social context; infrastructure; flows of passengers and, mainly, flows of goods.

Regarding the flow of goods transported through the Pyrenees, one of its most important sources of information is the *Encuesta TRANSIT*, a survey elaborated every five years by means of direct fieldwork interviewing truck drivers in the Pyrenees border. The collected data are the answers of a large sample of truck drivers to a structured questionnaire. The sample results are later extrapolated to estimate the data for the whole population. As an average over 80,000 questionnaires are recorded in each edition.

The main aspects related to the topics covered by the survey are: the technical characteristics of the vehicle and nationality, information about the journey (origin and destination, loading and unloading place, with different level of detail depending on the countries involved), type of commodities and tonnes transported. One of the key points of the survey is that a detailed Origin-Destination matrix can be obtained as a result.

The questionnaire content is listed below:

1. General information
 - a. Location where the questionnaire is answered
 - b. Driving direction where the questionnaire is answered
 - c. Vehicle plate
 - d. Type of vehicle
 - e. Number of axes
2. Questions:
 - a. Have you crossed the border (or are you going to cross it, depending on the direction)?
 - b. What is the tonnage of goods transported?
 - c. Are you carrying several categories of goods?
 - d. What goods are you carrying (the main ones, if groupage)?
 - e. Where did you load these goods (or unload them if empty)?
 - f. Where will you unload these goods (or load, if empty)?
 - g. Where did unloading take place (or loading, if empty)?
 - h. Which is the opposite border point of entry into or exit from France?
 - i. *What quantity (in litres)?*
 - j. What is the year of registration of the carrier vehicle?

SIMULADOR DEL HINTERLAND PARA LOS PUERTOS ESPAÑOLES – HINTERLAND SIMULATOR FOR THE SPANISH PORT SYSTEM

The general objective of the *Simulador del Hinterland* is to develop a simulation tool and a database of the hinterland of Spanish ports, providing information on the export and import flows loaded and unloaded at the different ports, their Spanish origin and destination, the type of commodity handled and the country of origin and destination of the products.

There are two main sources of information of the *Simulador del Hinterland*:

- The database *Estadísticas de Comercio Exterior de España* (Spanish Foreign Trade Statistics) elaborated and published monthly by the General Direction of Customs and Taxes of the Tax Agency with the information included in the **Single Administrative Document**, which compiles information on the Spanish export and import flows and the **Intrastat Declaration** provides information on commercial flows within the EU.
 - Fields of information included in this database are: year, month, flow, customs office, province, country, commodity type, transport mode, INCOTERM, container (Y/N), Intrastat/SAD, weight, units, value.
- The database from *Puertos del Estado* which compiles the files received from the ports every month with the information on loadings and unloadings included in the **Cargo Manifest** and the **Summary Declaration**.
 - Fields of information included in this database are: year, port authority, type of operation, place of origin/destination, commodity type, type of transport unit, previous transport mode, tonnes, units, TEUs.

Both databases contain complementary information that could be linked according to the following graph:

Puertos del Estado File (adjusted and validated)				Customs File (adjusted and validated)			
Variable number	Variable	Values	Example	Example	Values	Variable	Variable number
1	Year	2006	2006	2006	2006	Year	1
4	Operation type code	D E	D	I E	I E	Type of trade flow code	4
2	Port authority code	Linking file "Port authorities - Customs offices"	63	4611 4615 4621 4631 4650 4699	Linking file "Port authorities - Customs offices"	Customs office code	6
6	Country code	ISO code for countries and territories	CN	CN	ISO code for countries and territories	Country code	12
12	Commodity type CN code	CN classification code at 4 digit level	8508 (Aspiradoras)	8508 (Aspiradoras)	CN classification code at 4 digit level	Commodity type CN code	18
16	Type of unit code	Puertos del Estado code for type of transport unit	31 32 33 34 C1 CP2 CP4	1	0 / 1	Container code (Yes / No)	36

Graph 19: Databases matches

Tasks carried out to develop the Hinterland Simulator could be divided into four blocks:

- Block of Tasks 1. Filtering and Adjusting the *Puertos del Estado* Database
- Block of Tasks 2. Filtering and Adjusting the Customs Database (*Estadísticas de Comercio Exterior de España*)
- Block of Tasks 3. Programming the Linkage of Both Databases
- Block of Tasks 4. Validating the New Database

Block 1. Filtering and Adjusting the *Puertos del Estado* Database

Task carried out in this block could be summarised as follows:

1. Validating the structure of the file
2. Introducing new variables describing the codes
3. Completing the master files of codes and their corresponding descriptions (ex. New values for the UN LOCODE file)
4. Validating the structure of the file after the changes previously listed
5. Loading of data into the programme
7. Generating a report on the loaded data
8. Creating a search table for the user to access the loaded data
9. Elaborating a package of pre-designed searches
10. Generating a new file with operations of loading and unloading that could be linked to export and import flows in the Customs file

Block 2. Filtering and Adjusting the Customs Database

Analogously to block 1, the adaptation of the second database is performed in this block according to the following methodology:

1. Validating the structure of the file
2. Introducing new variables describing the codes
3. Completing the master files
 - Including new values for the Customs office field of information: local, provincial and central offices where the Intrastat Declaration can be submitted
 - Creating a master file including all the community codes in the NC classification that have been accepted between 1995 and 2008.
4. Validating the new structure of the file after the changes previously listed
5. Loading of data into the programme
6. Generating a report on the loaded data
7. Creating a search table for the user to access the loaded data
8. Elaborating a package of pre-designed searches
 - Generating a new file with exports and import flows that could be linked to loadings and unloadings in the *Puertos del Estado* database (the new one including only operations that can be linked with trade flows in the Customs database)
9. Selecting registries where “Code of mode of transport” is 1 (maritime)
10. Filtering and excluding those registries with errors in the type of commodity declared (even if all commodity codes since 1998 are considered valid)
11. Creating the variable “Code of the Port Authority Linked to the Operation”
12. Filtering and excluding those registries where there is no port authority related to the operation

13. Creating the variables “NST-R commodity 1-digit level code”, “Description of the NST-R commodity 1-digit level code”, NST-R commodity 2-digit level code”, “Description of the NST-R commodity 2-digit level code”, NST-R commodity 3-digit level code”, “Description of the NST-R commodity 3-digit level code”, NST-R commodity 24-groups code”, “Description of the NST-R commodity 24-groups code”, NST-R commodity 13-categories code”, “Description of the NST-R commodity 13-categories code”.
14. Correcting the weight field of information for those registries where weight is blank or 0
 - Registries with 0 or blank weight will be assigned a Unit Value Index (Vim) according to their specific combination of values in the fields “flow – province – CN 8 digits”. If there is no match for the combination at 8-digit level, then the UVI_{pm} will be assigned searching for the corresponding value at 6-digit level and so on.
 - Creating the variable “Corrected weight in kg” for those registries with 0 or blank weight originally. The value of this new field will be assigned according to the formula: Value (Euros) / UVI_{pm} (Euros/Kg) assigned
15. Generating a report on the correction of the weight variable
16. Checking the structure of the resulting file

Block 3. Programming the Linkage of both Databases

Once both databases have been transformed and adapted to the requirements, the following block consists of the creation of a new database which combines the information included in them. The tasks carried out to compile this new database are listed below:

1. Creating a new file “Final Database” that includes all the registries in the filtered and adjusted *Puertos del Estado* database (only those registries that can be linked to the Customs database)
2. Including the following fields of information in the “Final Database” :
 - Trade flow code
 - Province code
 - INCOTERM code
 - UVI (Euros / Kg)
 - Statistical value of the shipment
 - NST-R commodity code (1-digit level)
 - NST-R commodity code (2-digit level)
 - NST-R commodity code (24 groups)
 - NST-R commodity code (13 categories)
 - And the descriptions of all the previous fields
3. Creating and storing tables to assign values to the new fields of information. As many tables as combinations of the fields “flow”, “port authority linked to the operation”, “country” and “type of commodity at 4-digit CN code” exist, have been created.
4. Calculating the previously mentioned tables in percentages.
5. Giving values to the trade flow fields
 - Loading → Export flow
 - Unloading → Import flow
6. Assigning values to the “province code”, “province”, “INCOTERM code” and “INCOTERM” fields
 - Reading the combination “Year-Flow-Port authority-Country-Commodity type code” of the original registry in the filtered and adjusted *Puertos del Estado* database

- Creating as many new registries as different combinations exist of the province and INCOTERM fields in the associated table
 - Copying the existing fields of information of the original registry in all the new registries and including the new fields of province and INCOTERM
7. Assigning values to the “weight (tonnes)” field
 - Since for every original registry in the Puertos del Estado database several registries are generated in the Final Database, the weight of the original registry needs to be distributed between the new registries according to the percentages of its corresponding associated table.
 8. Giving values to the “units” field of information
 9. Assigning values to the “TEUs” field
 10. Giving values to the “UVI (Euros/kg) field
 - The fields “year, trade flow, province, 4-digit commodity type” are read and the specific combination of those fields is searched in the table where the UVI had been calculated (already used to correct the weight of registries)
 - If the combination at 4-digit commodity type does not exist, then the specific combination is searched at 2-digit commodity type
 11. Estimating the statistical value of the shipment in Euros
 - The statistical value of the shipment is calculated multiplying the weight in kilograms by the UVI_{pm} (Euros / kg) assigned to the specific registry (depending on its combination of year, flow, province and commodity type)
 12. Giving values to the 1, 2 digit, 24 group and 13 categories NST-R fields
 13. Checking the structure of the resulting final database
 14. Creating an OLAP cube for database searches
 15. Creating OLAP cubes for 99 pre-defined searches

Block 4. Checking the Results

Finally, a set of tests and validation were designed and elaborated in order to check the accuracy of the information contained in the new Database.

TRANSPORT SUPPLY DATABASES BY MODE OF TRANSPORT: LINEPORT AND LINERAIL

One of the key obstacles facing any research team working in the field of maritime freight transport is data collection. In the case of currently existing short-sea shipping (SSS) services the problem facing research teams is not so much a shortage of information but rather the lack of a homogeneous information source providing detailed and up-to-date data for all services offered at Spanish ports.

In effect, there coexist a multitude of sources that compile data on SSS services currently provided by Spanish ports. The nature of the information provided however differs from source to source according to the targeted public. It should be further added that the data supplied by these sources does not suffice from a research team's point of view to be used as a basis for a detailed analysis of the current offer of SSS services in Spain. This is exemplified by the complete absence of any historical series of the evolution of the offer of SSS services and its characteristics. These substantial shortcomings have led the Valenciaport Foundation to construct the LinePort database. The database has been designed to effectively collect and homogenise information related to the current offer and characteristics of SSS services in Spanish ports.

The LinePort database collects the information concerning the characteristics of regular SSS services currently on offer between Spanish ports and their counterparts in EU member states or countries with a shore on the Adriatic, Baltic, Aegean, Mediterranean, Black and North seas.

The information compiled in LinePort provides a global vision of the SSS services currently on offer in Spain and it makes possible to carry out a detailed analysis of the characteristics of these services in each port. This, in turn, provides a deeper understanding of the current situation of SSS in Spain, its limitation and possibilities as a viable alternative/complement to road transport.

LinePort is a tool to provide the port-logistics community with exhaustive quality information on the offer of SSS services, allowing it thereby to be better prepared to take decisions in its various fields of activities. It provides detailed information on the characteristics of the services (type of service, frequency, rotation, transit time, number of vessels used per service, etc....) and the characteristics of vessels used (speed, GT, maximum capacity for transporting TEUs/swap bodies, age, etc....)

Finally, it could be remarked the publication of a half-yearly newsletter on the state of SSS in Spain with global indicators of the offer of SSS services, indicators for SSS services serving as an alternative to road transport and Motorways of the Sea.

Following similar criteria and methodological approach, the Line Rail database compiles information about regular rail freight services that guarantee fixed departure schedules and itineraries and that can be either used by a customer sending high volumes of cargo or by various customers.

ANNEX 2: PRESENTATION OF THE SPANISH MODEL: A WAY TO BOOSTING RAIL FREIGHT TRANSPORT.

The internal structure of the monopolist public rail company in Spain, RENFE, changed with the incorporation, in 1990, of a horizontally structured organisation, the doing away with area organisation and the setting-up of business units.

The path taken in Turkey with the coming into force in April 2013 of the Bill ON LIBERALISATION OF RAILWAY TRANSPORTATION OF TURKEY to separate infrastructures from operation within a framework to liberalise rail transport operations, was undertaken in January 2005 in Spain with the splitting of the monopolist railway company in Spain, RENFE, into two:

- ✓ ADIF (administrator of the infrastructure and traffic manager) and
- ✓ RENFE OPERADORA (rail operation in a competitive system with other railway operators).

The latest step taken by the Spanish government in September 2013 is a new business model for RENFE OPERADORA by way of the setting-up of four state-owned companies:

- ✓ Renfe Viajeros (Passengers),
- ✓ Renfe Mercancías (Freight),
- ✓ Renfe Fabricación y Mantenimiento (Manufacturing and Maintenance) and
- ✓ Renfe Alquiler de Material Ferroviario (Rail Equipment Rental).

With a view to ensuring the coordination and efficient allocation of resources, the state company Renfe Operadora, outright owner of the capital shares of the new companies, will act as the group's parent company undertaking corporate and services' functions.

The aim of the restructuring plan is to endow Renfe Operadora with a suitable framework to tackle and promote the liberalisation process and the opening of the rail sector to competition and to encourage this by means of setting-up a new rail equipment rental company (equipped with 51 self-propelled trains, 49 locomotives and 1,000 cars to be made available to the market) to favour competition in passenger and freight transport.

The setting-up of Renfe Operadora's new company structure includes the partial splitting-up of the company, which will see the creation of new companies: Renfe Viajeros (Passengers), Renfe Mercancías (Freight) and Renfe Fabricación y Mantenimiento (Manufacturing and Maintenance). These will take the place of the current business areas. Furthermore a new company will be set up to rent out rail equipment, namely, Renfe Alquiler de Material Ferroviario (Rail Equipment Rental).

The new structure's business model is to be headed by the state company, Renfe Operadora, which will continue to exist as the parent company and will define the group's business strategy and seek efficient management by focusing on corporate functions.

The new companies will have their own direction and management bodies to define their strategy and pursue their production activity, both in Spain and abroad.

The personnel needs of the companies to come out of the operations provided for in this Agreement will be personnel exclusively from RENFE-Operadora.

The integration of RENFE-Operadora personnel into the companies to be set up will in no case represent an increase in staff, salaries, or other personnel costs for the public sector and will be implemented upon receiving a prior report approving the action from the Spanish Ministry of Finance and Public Administration.

The company structure of the new group Renfe Operadora will be as follows:

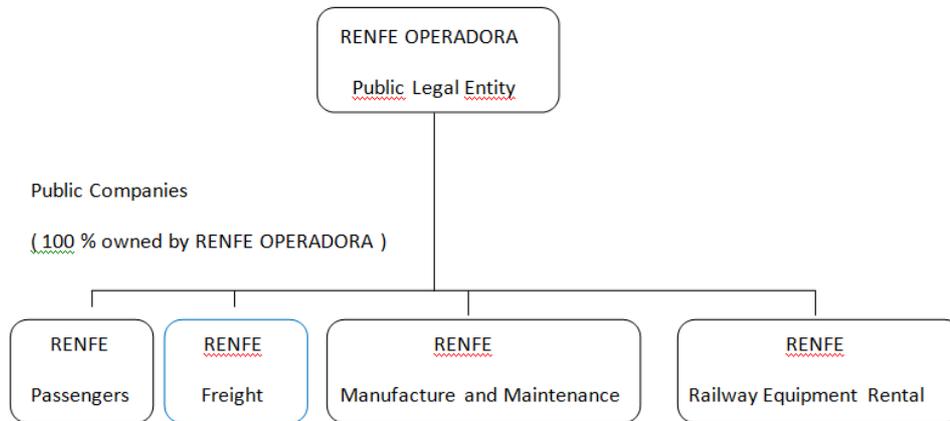


Image 19: RNF E Operadora Organization Chart

Advantages of setting up the new companies:

Deepening of private management structures.

- This is an ideal tool to participate in public-private projects, both as regards Terminal operation, as well as with respect to national and international transport and integrated logistics' projects.
- It provides access to funding structures that do not depend on the state's general budget, including the incorporation of strategic partners in joint venture companies.
- It makes it possible to diversify what the company has to offer by means of joint ventures, with the consequent effects these bring such as opening it up to better information processes and technological improvements.
- The creation of the Rail Equipment Rental company responds to the demands of private railway companies, which have conveyed to the Spanish Ministry of Public Works that the big investments that have to be made (locomotives and wagons) in order to enter this business activity is a deterrent, and one that is quite often insurmountable.

The idea behind creating this machinery pool is to reduce the start-up investments required by private operators, so as to prevent these investments becoming a barrier to competition.

On the other hand, it makes it possible to make a profitable use of existing equipment that is not being used.

The Freight division of Spain's Public Rail Undertaking, RENFE OPERADORA, has been operating in accordance with the following business unit organisational structure:

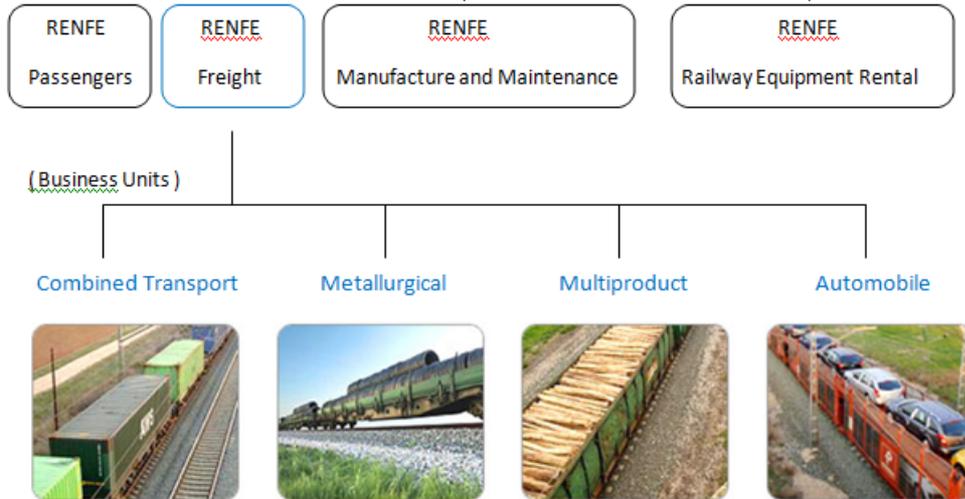


Image 20: RENFE operadora business unit organisational structure

The RENFE Freight operating division responds to a logical sectorial, or product type, division:

- ✓ Combined Transport Business Unit. : Containers, Swap-Bodies, semi-trailers.
- ✓ Metallurgical Products Business Unit: Pipes and other metallurgical products.
- ✓ Multiproduct Business Unit: Bulk, Wood, Minerals, Cement, Stone, Petrochemicals
- ✓ Automobile Business Unit: Vehicles and Machinery.

ANNEX 3: DUISPORT INTERNATIONAL INLAND PORT AND LOGISTICS HUB EXAMPLE

Duisport description

Duisport is the commercial and transportation centre of the Rhine region in Germany.

The hub is located with 30 million people living and working within 150 km from Duisberg, and 300.000 companies which are operational in the region. Of these companies, 250 are specializing in transport and logistics and offer their services in the logistics hub. The hub covers an area of 13,55 million square meters and has four container terminals with 10 container gantry cranes.

Easy access to the hub can be gained from major European waterways, railroad lines and highways and is ideal for ship, train, truck and passenger vehicle traffic.

The hub comprises four intermodal terminals and 1.2 million square meters of covered storage area. There are three modes of transport directly linked to the Duisport Logistics hub, namely waterways, railroads and highways.

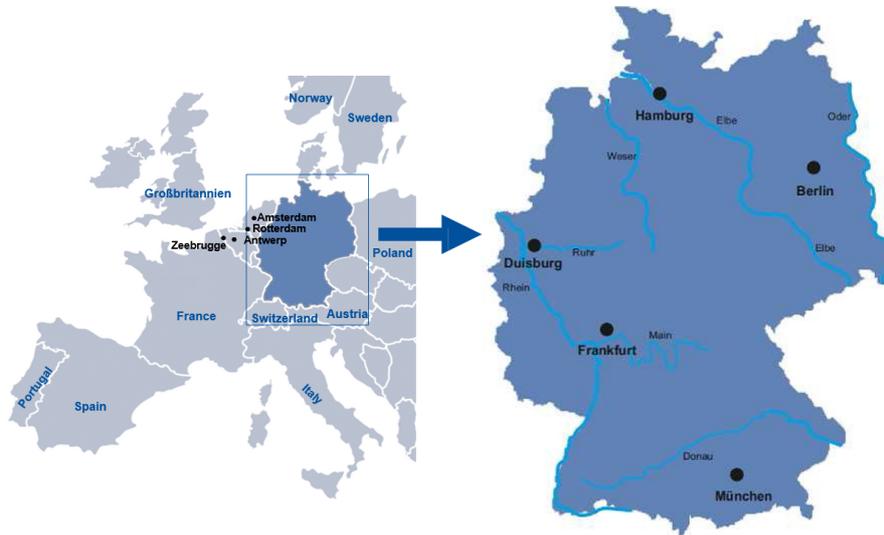


Image 21: Optimal location at the heart of Europe. Europe – Germany – Duisburg

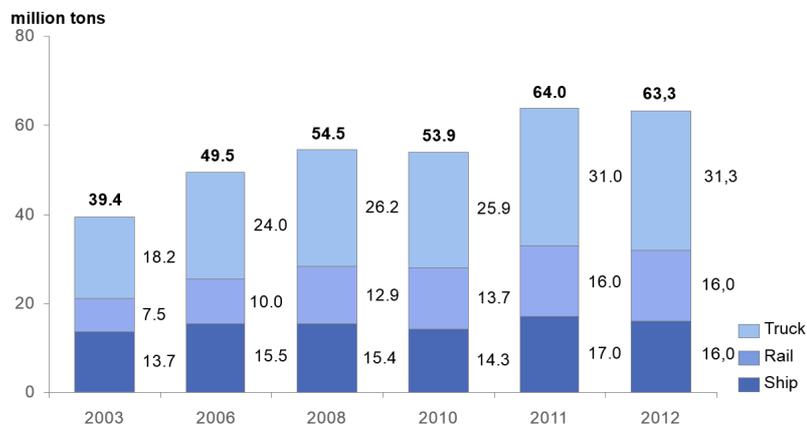
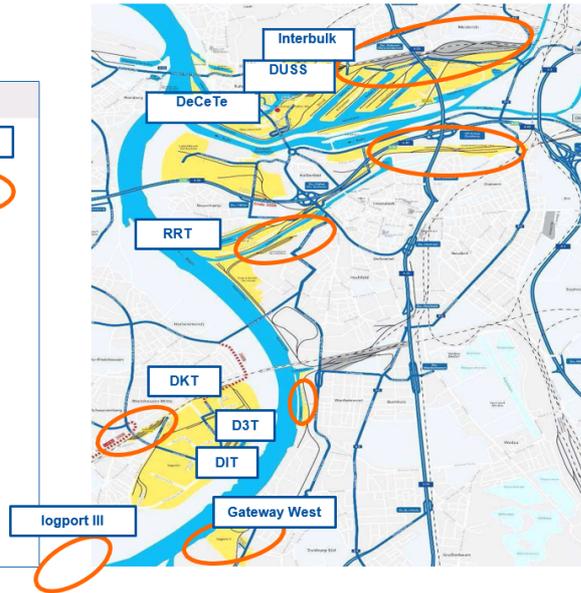


Image 22: Total Turnover of the Duisport Group. Distribution by transport mode

The Duisport Logistics Hub seized an opportunity by developing a dedicated coal blending and loading facility, five coal unloading terminals and five steel service centres for processing steel products.

Infrastructure is a prerequisite for efficient logistics

- Network in Duisburg
- 9 container terminals on approx. 85 ha
 - 7 fully developed marshalling yards
 - 5 imported coal terminals
 - 6 steel service centers
 - 130 crane facilities, up to 500 t
 - 19 liquid cargo transfer facilities
 - 2 roll-on/roll-off facilities with 220,000 m² for automobile logistics
 - 2.0 million m² roofed storage area/ 740,000 m² warehousing areas



The port of Duisberg is Germany's largest inland coal hub. There are five dedicated coal terminals with an annual capacity of eight million tons. Coal from Rotterdam or Amsterdam is moved on the Rhine River to Duisberg. imported coal is received from the USA, South Africa , Poland, Australia and Colombia and is distributed to power stations in the region or to the steel industry.

Apart from coal, the port also handles around 100 000 tons of scrap metal per month and 19 terminals handle liquid cargo.

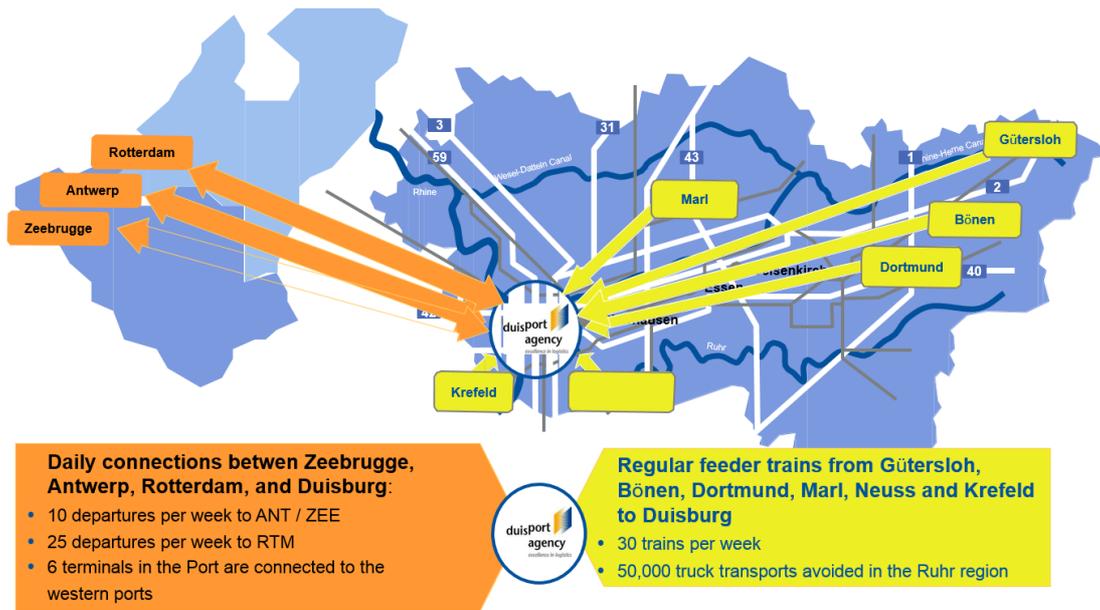
duisport offers an extensive network for Europe

- International transport network
- Excellent railway and ship connections for ZARA*- and German seaports as well as Eastern and Western Europe
 - Scheduled connections to more than 80 European and 20 national destinations
 - 25 national and international railway service providers and operators
 - Daily shuttle transportation to the seaports
 - 20,000 trains per year in the Port



duisport has excellent connections to large parts of Europe

*) Erläuterung: ZARA = Zeebrügge, Antwerpen, Rotterdam, Amsterdam



Together with customers, they are developing European railway concepts:

"United Kingdom,"

- 5 connections per week to UK via Port of Zeebrugge

"Scandinavia,"

- Daily multiple connections to Norway/Sweden/Finland

"Moscovite Express,"

- This product operates 2 x per week between Duisburg and Moscow and continues to Chongqing

"France"

- Together with our partner „Green Modal“, we offer a connection to Lyon / Marseille 4 times a week

"Southeast Europe Daily"

- We guarantee daily departures from Duisburg to the growth markets of Southeast Europe to the Bosphorus



In tune with the times—at the heart of Europe, duisport makes it possible to import goods via all major European ports allowing for a flexible, free selection of shipping companies.



International transport network

- Excellent railway and ship connections for ZARA* and German seaports as well as Eastern and Western Europe
 - 25 national and international railway service providers and operators provide connections to > 80 destination in Europe
 - Daily shuttle transportation to the seaports
- *Explanation: ZARA = Zeebrugge, Antwerp, Rotterdam, Amsterdam

Intelligent logistics concepts

- Logistic transport chains developed according to customer needs
- Attractive areas with road, rail and water access
- Support provided by Duisport for project development, object financing, construction work, authority contacts & facility management

Efficient infra/superstructure

- 9 intermodal container terminals
- 200 km company-owned rail infrastructure

Duisport – excellence in logistics. Most important hinterland hub in and for Germany:

The largest inland port in the world and Leading logistics centre in Europe

- > 110 million tons of cargo handled per year (incl. private company ports)
- > 2.6 million TEU throughput per year (TEU = Twenty foot Equivalent Unit)
- > 70 business settlements in roughly 10 years (30 from abroad)
- 1,350 ha logistics space
- 2.0 million m² roofed storage area
- > € 250 million in investments initiated by Duisport per year

Most important trade and transport turntable of the Rhine-Ruhr region

- > € 3 billion value added by the Port per year
- 20,000 ships and 20,000 trains per year in the Port

Duisport figures

- > 300 companies operating in the port

Broad supply of sustainable means of transport	-7 50,000 fewer trucks per year
<ul style="list-style-type: none">• Directly on the Rhine – Europe's most important waterway• Railway junction #1 with regional shuttle network (Chemsite Exp., OWX, GaE)• At the intersection of international motorway axes (A3, A40, A57)	
Environmentally-friendly terminal operations	-7 Relief environment/residents
<ul style="list-style-type: none">• Low-emission, state-of-the-art plants minimize noise and required power• Terminals / buildings constructed acc. to energy savings ordinance	
Emission-reducing infrastructure measures	-7 Reduction by 30%
<ul style="list-style-type: none">• Ring road east and traffic guidance system relieve residential areas and reduce traffic jams• Customer-specific transport and logistics concepts reduce emissions• Development/marketing of sustainable concepts for logistics areas in the Ruhr region• Ship can access the land power network and switch off generators	
Conservative use of resources	-7 200 t less wood used per year
<ul style="list-style-type: none">• Use of reusable wood packages in industrial packing• Use of traffic calculation devices optimizes transport efficiency	

Duisport offers a comprehensive range of logistic solutions from a single source

Learning's and Transfer abilities

From an infrastructure operator to a customer-driven service provider

- 1.- Cooperation and integration of strategic partners.
- 2.- Long-term investments in essential infrastructure interfaces, i. e. terminal and railway infrastructure.
- 3.- Establishment as an innovative customer-driven solution provider.
- 4.- Offering of various value added services, i. e. rail services, facility management, consulting.
- 5.- Build up and extension of an international transport **Network**.



ANNEX 4: FORMULATION OF RECOMMENDATIONS AND ADJUSTMENTS TO THE HASANBEY ESKISEHIR LOGISTICS CENTRE MODEL PROJECT AND LAY-OUT.

The HASANBEY ESKISEHIR LOGISTICS CENTRE model is a collection of railway functionalities and auxiliary buildings (Marshalling Yard, Railway Hangars, Freight Combined Terminals, offices, warehouses for break bulk cargo handling, etc.) grouped together in a shared space: the two Freight Combined Terminal lay-outs presented (end-of-line terminal and through terminal) must be revised and modified.

For the following reasons:

The end-of-the-line container terminal lay-out is not operational on lacking connection to the general network or reception/dispatch platform, shunting siding and/or escape tracks on the loading/unloading group (See image below).



Photograph 1: Hasanbey Centre lacking connection

The end-of-the-line Container Terminal lay-out has a limiting fence along the perimeter between the intermodal area and the stacking area that impedes efficient operation. It is recommended that this be removed.

The lighting towers must be shifted outside the railway loading/unloading area in the end-of-the-line Container Terminal lay-out.

Both Container Terminal lay-outs must be revised with respect to their railway functionality (750 m length of the loading/unloading group).

These stacking area lay-outs (slot allocation) prevent their use with RSL-type travelling cranes.

The slots are laid out perpendicularly to the movement of the crane, thus obliging unnecessary turns, making container movement manoeuvres difficult.

The space between the rows of stacking slots is not enough for RSL crane manoeuvres and does not suffice for the manoeuvring of loading/unloading truck cranes.

It is recommended that the initial plan be fully revised.

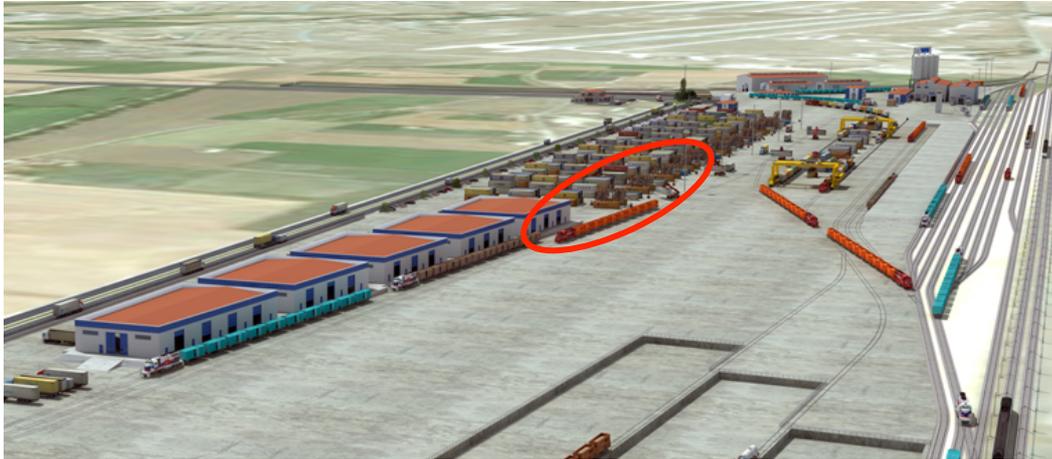
Both lay-outs are lacking a defined truck circuit that makes operational Terminal management possible.

There are no areas allocated to waiting trucks and parking.

The through Container Terminal lay-out has the container load operation at the front line of the stacking area thus completely invalidating the entire operation. It is recommended that this be removed.

As regards the Through Container Terminal the whole modal interchange area is crossed by a connecting rail line to the conventional car loading/unloading areas that interrupts the main operational purpose (See image below).

It should be removed, which implies redesigning the proposed Logistics Centre lay-out.



Photograph 2: Hasanbey Centre lay out reviewed

In order to design a proper Freight Combined Terminal lay-out, priority must be given to its definition as a place where a transport unit intermodal interchange takes place between the railway and road modes, configured for a connection between modes in the transport flow without breaking the cargo.

The General Directorate of Turkish State Railways Administration (TCDD) has developed a Hasanbey Eskisehir model Logistics Centre that brings the following functionalities together in the same space: Marshalling Yard, Freight Combined Terminal, Maintenance hangars for rolling equipment (Locomotives), Railway Terminal (Bulk Cargo) and logistics areas (offices and warehouses).

The grouping of the different railway functionalities in the same place must be founded on shared suitability premises with respect to the location of the centre for each one of the railway functionalities.

The analysis of the Hasanbey Eskisehir Logistics Centre model suggests the need to re-arrange the space and the location of the different railway functionalities in accordance with the peculiarities of each one of them (in accordance with cargo and logistics flows).

In the case of a Freight Combined Terminal, its location is essential to implementing a profitable and competitive combined transport chain.

Transport distances by road to/from the Freight Combined Terminal to the loading/unloading points of the unit cargo (in containers, swap-bodies or trailers) is a decisive factor for the combined transport chain price to have a market chance against the single mode or truck alone transport chain.

Before analysing the Freight Combined Terminal lay-out in the Hasanbey Eskisehir Logistics Centre model two basic operational premises must be laid down:

- Combined transport unit or Complete Truck.
It is essential to establish if the transport flows of the hub in question determine the feasibility of a terminal lay-out for the transfer and storage of containers, swap-bodies, semi-trailers or is open to complete truck rail transport.
Depending on the answer the lay-out can change accordingly.
- Flexibility and adaptability in the main different operations carried out at a centre (rail Freight Combined Terminal, intermodal, stacking, road) is prior to any planning of actions as regards complementary services (logistics, customs or others).

ANNEX 5: EXPERTS INVOLVED ON THE STRATEGIC PAPER DEFINITION

The people interviewed were the following:

- X İzzet Isık, Project Leader, Deputy Director of Directorate General of Dangerous Goods and Combined Transport Regulation (DG of DGCTR), Former Head of Department in DG of Road Transport Regulation Ministry of Transport, Maritime Affairs and Communications
- X Bülent Sülo lu, EU Expert- RTA Counterpart
DG of Dangerous Goods and Combined
Ministry of Transport, Maritime Affairs and Communications. Transport Regulation
- X Emre Dinçer, Head of Department of International Maritime Relations
 - Ministry of Transport, Maritime Affairs and Communications
 - DG of Maritime Trade
- X Ömer Çelik, Head of Area of Economic Research
 - Ministry of Transport, Maritime Affairs and Communications
 - TCDD
 - DG of Research, Planning and Coordination
- X Samil İrivan, Deputy Head of Area of Economic Research
 - Ministry of Transport, Maritime Affairs and Communications
 - TCDD
- X Emrah Onur, EU Expert- BS Component Leader 3
 - Ministry of Transport, Maritime Affairs and Communications
 - DG of Foreign Relations and EU Affairs
- X Hasan Boz, EU Expert
 - Ministry of Transport, Maritime Affairs and Communications
 - DG of Road Transport Regulation
- X Kenan Kayacı, Chief Engineer
 - Ministry of Transport, Maritime Affairs and Communications
 - DG of Highways
- X Önder Göçmen, Elif Akkurt, Bari Biçimseven, Gülçin İnen, Arzu Güngördü
 - Ministry of Customs and Trade
 - DG of Customs- Transit Department & DG of Liquidation Procedures & DG of Risk Management and Control
- X Demet Cavcav, Expert
 - Ministry of Transport, Maritime Affairs and Communications
 - Department of Strategy
- X Sami Gür
 - Ministry of Transport, Maritime Affairs and Communications
 - Kapıkule Border Gate- TCDD
- X İsmail Asar, Director of the station
 - Ministry of Transport, Maritime Affairs and Communications
 - Kapıkule Border Gate- TCDD
- X Burçin Yazalan, Sales & Marketing Expert
 - Çelebi Bandırma International Port Managing Inc.
- X Ali İnenel, Sales & Marketing Manager
 - Çelebi Bandırma International Port Managing Inc.
- X Mesut Uysal, Logistics Manager
 - TCDD Eskisehir Logistics Department
- X Metin Perk, General Coordinator
 - Ankara Logistics Center
- X Hakan Bezginli, General Manager
 - Ankara Logistics Center