

# Studies on Sustainable Policies of European Intermodal Transport System\*

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## Abstract

Transport is an important sector of government regulation. Every country has its own transport policy, but European countries are evolving a common transport policy, which has a long history.

The establishment of a consistent common policy in the EU's transport sector is still underway. The key motivations of this policy are 1) to establish and implement a common transport policy, 2) to clarify the concept of sustainability in the transport sector, and 3) to integrate transport services into a common infrastructure. One of the policy's objectives is the progressive movement towards sustainable development in the transport section.

The EU's transport policy has recognised that intermodality is a very important competitive tool. The EU's policy thrust in intermodal transport can be categorised into infrastructure, technology, and standards and rules. However, obstacles to success can be detected. Cases like that of TEN-T and Marco Polo illustrate European intermodal policies in practice.

As regards sustainability in the transport sector, intermodality can be an alternative solution to the increasing imbalance between transport modes and congestion arising from increased road use. Sustainability has been emphasised by the EU, which aims to establish intermodality in its future alternative transport systems while fostering sustainable development in the transport sector.

Therefore, intermodality can be defined as a general trend in the current transport market, drawing interest from public institutions and transport-related market players. The EU has thus made an effort to facilitate intermodality in its territory, materialised through various policy options. Therefore, looking into the EU's intermodal transport policies is worthwhile, as doing so can provide useful lessons for all concerned parties.

Keywords: European, Transport Policy, Multimodal, Sustainability, TEN-T, Marco Polo

## I. Introduction

Transport is an important sector in the European Union and it has largely contributed to economic aspects like investment, energy and employment. It is required that the European Union has to develop a common transport policy in order to cope with the appropriate demand of transport as well as to establish an efficient transport system between each close member country. The publication of the 2001 White Paper is aiming to improve infrastructure and to extend the transport network within the EU. Also, one of the objectives is a progressive activity towards sustainable development in the transport area.

The intermodality could be an alternative solution against the growing imbalance between modes of transport in the European Union, and ever-worsening congestion by increasing the success of road transport. The improvement of intermodal transport is crucial to sustainable transport policy. In that sense, various strategies can be proposed. As far as intermodal transport policies are concerned, the establishment of TEN-T has been launched to eliminate bottlenecks and to set up a network of transport infrastructure. The Marco Polo programme has been also implemented to promote intermodality. This paper will examine the European common transport policy in the first instance, and then study strategic aspects and policy alternatives of intermodal transport in order to look into sustainable policies of intermodal transport in the European Union.

## II. European Intermodal System in General

### 1. Key Policy Priority

Intermodal freight traffic is increasing globally. According to the World Bank, the number of intermodal containers passing through ports worldwide doubled over the last decade, with similar progressions in intermodal air traffic, intermodal rail traffic and intermodal truck traffic. Indeed, the development of intermodal transport has become a key policy priority and challenge at the global level.

The government's role is primarily to assure a level playing field for the market, provide a coherent and interoperable transport and logistics network of routes, corridors, ports, airports, and terminals and promote its optimized use meeting environmental requirements. Intermodal transport is being promoted through policies addressing all political levels. The policy maker's role in intermodal transport poli-

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cies is to assure an environment for a smooth functioning market, to maintain a complete and interoperable multimodal transport network and to promote its optimised use in order to minimise environmental externalities (Pekin, 2009).

In Europe, the prevailing tendency is to try to force intermodal policies through a top-down approach led by the European Commission. In many EU member countries as well as Switzerland intermodal transport is an important part and objective of sustainable transport policies often accompanied by modal shift actions diverting freight traffic from road to rail and, where feasible, to coastal shipping and waterways.

## 2. The EU's White Paper

The EU has undertaken numerous actions towards breaking down different barriers between Member States, providing more freedom for movement of people and goods between them. Removing and/or alleviating barriers have emerged as the main objectives and precondition for the overall future and smooth growth of 'Single Market'. Some of the important actions have been (1) the design and implementation of a 'Common Transport Policy'(CTP); (2) the introduction and promotion of the concept of 'sustainability' for the transport sector; and (3) integration of transport infrastructure and transport services (i.e. development of integrated transport systems).

In fact, common transport policies and tools are divergent, but they all share a set of common objectives. They all foster prosperity through innovation, sustainability, optimisation, increased profitability with lower costs (while maintaining European employment), less accidents, less congestion, and less environmental damage. In co-ordination with the White Paper target of returning to the modal split of 1998, this set of common objectives can and will foster intermodality.

The European Commission has launched a comprehensive programme for the European transport policy with its White Paper on European Transport Policy with the aim to eliminate bottlenecks in transport by building up Trans-European Networks of Transport (TEN-T) and to guarantee fair and efficient pricing of transport (Bröcker & Schneekloth, 2005).

The White Paper adopted by the Commission on 12 September 2001 sets out a comprehensive strategy aimed at delivering a sustainable transport system, from an economic, social and environmental viewpoint. A key objective of the paper is to shift the balance of transport in Europe from road and aviation towards rail, shipping and intermodal operations by 2010 <Table.1>. Intermodal transport is one of the measures to achieve this objective. A revised version of the White Paper under preparation attempts to re-balance the policy towards economic objectives focusing on a modal merge instead of a modal shift considering the general recognition that policies for modal shift are not working. The aim of the Communication, presented on 28 June 2006 in follow up to the Transport White Paper Mid-Term review is to optimize the use of all transport modes and facilitate their integration into a single supply chain (Zeybek, 2010).

<Table 1> Proposals of the Transport White Paper (2001)

Shifting the balance between modes of transport * Improving road quality: restructuring, regulation * Rail : optimal use of the infrastructure and modernization * Air integration and modernization * Sea and inland waterways integration * Intermodality: freight integrators
Eliminating bottlenecks * Multi-modal freight corridor investments * Priority links * High speed passenger network * Financing the infrastructure
Placing users at the heart of policy * Infrastructure charges * Harmonising fuel taxes * Improving passenger intermodality * Promoting urban transport
Managing the globalisation of transport * Europe must be more assertive on the world stage * Representation in international bodies * External dimension to air transport

Source : Ogorelc (2003). 198.

## 3. Sustainability

There is a growing imbalance between modes of transport in the European Union. The increasing success of road and air transport is resulting in ever worsening congestion, while, paradoxically, failure to exploit the full potential of rail and short-sea shipping is impeding the development of real alternatives to road haulage. Against the background of a predicted 50% trucking increase from 1998 to 2010, the basic challenge is to reduce road congestion. To solve this problem, two priority objectives need to be attained by 2010: - regulated competition between modes; a link-up of modes for successful intermodality. (Antti Permala, et al., 2009).

The most recent CTP (from 1995) has drawn special attention to the 'sustainable' development of transport systems in the EU. It has been believed that 'sustainability' can be achieved, apart from other measures, by changing the present market balance between dominant road transport mode on one side in favour of other non-road modes on the other, for both goods and passenger transport. Specifically, in goods transport, road market share has expected to be reduced. Use of intermodal transport options, in which non-road mode-rail, inland waterways, short-sea shipping, and pipelines - would have a dominant role, has been expected to carry out some achievements.

In such a context, integration of transport networks and transport services, and thus creation of integrated transport systems at a wider scale and scope with competitive and value-added integrated door-to-door services have been expected to significantly contribute to 'sustainability' of transport operations.

## 4. The SEM and Intermodality

Following the creation of the Single European Market (SEM) in 1993, important steps towards the reduction of barriers to international

transport operations in Europe have been realized. The SEM was seen as necessitating not only the creation of liberal transport markets to meet its overall objectives of exploiting genuine national comparative advantages in the production of goods and services within Europe, but also the need for coordination of transport infrastructure provision. These factors formed both an intellectual basis for a common transport Policy and effectively extended it beyond its original focus on transport operations.

Modal coverage has also been widened, and the initial pre-occupation with land surface transport has now been extended into the maritime and aviation sectors (Button, 1998). Today, intermodality is an important topic of European common policy and a subject to detailed analysis during the last ten years. Establishing intermodality and managing intermodal nodes to obtain sustainable cargo and passenger mobility is an essential goal for the EU member states and other European regions, like the territory of South-East and Eastern Europe (BEŠOVNIK, 2010).

### III. EUROPEAN INTERMODAL POLICIES AND CASES

#### 1. Intermodal Transport Policy

Improved intermodality is crucial for sustainable transport policies. The European Commission is a mighty defender and promoter of intermodality as part of the European Union’s Common Transport Policy for sustainable mobility. The policy vision is to develop a structured approach to intermodal freight transport in the framework of a single transport market with advanced harmonization of regulations and competition rules.

Table. 2 summarized the key elements of the EU’s basic intermodal policy. The declared goal is to optimize interdependence and complementarities of transport modes.

<Table 2> Overview of elements of intermodal policy in the EU

Infrastructure	- intermodal design of trans-European Networks (TEN) - Missing links: Intermodal priority projects - Design of intermodal transfer points
Technology	- IT system, ITS - Satellite based communication system - EDI - Value-added logistics services (esp.E-logistics)
Rules, Standards	- Intermodal competition rules - Intermodal liability, work regulations - Common charging and pricing - Interoperable systems & equipment (esp. load units)

Source : Burkhard & Toshinori (2005). 2.

Table. 3 also provides a historical list of policy and regulatory frameworks of the European intermodal transport policy.

<Table 3> Policy and Regulatory Framework

Year / Reference	Title
1992/COM(92)494	White Paper on the Future of the Common Transport Policy
1992/92/106/EEC	Council Directive on the establishment of common rules for certain types of combined transport of goods
1992/93/45/EEC	Commission Decision concerning the granting of financial support for pilot schemes to promote combined transport
1997/COM(1997)243	Communication on intermodality and intermodal freight transport in the EU
1995/COM(1995)691	Green Paper on Fair and efficient pricing
1996/COM(1996)421	White Paper A strategy for revitalising the Community’s railways
1996/1692/96	Community Guidelines for the development of the Trans-European Transport Network
1997/COM(1997)242	Communication on Rail Freight Freeways
1997/COM(1997)678	Green Paper on Port infrastructure
1998/COM(1998)466	White Paper on fair payment of infrastructure use
1998/2196/98	Council Regulation concerning the granting of community financial assistance for actions to promote combined transport
2001/COM(2001)370	White Paper: European transport policy for 2010
2003/COM(2004)56	Commission proposal for a Directive on ILUs
2006/COM(2006)314	Communication on the mid-term review of the EC’s 2001 Transport White Paper
2007/COM(2007)607	Communication on the freight transport logistics action plan
2008/COM(2008)433	Communication on the greening transport

Source: Pekin (2009), 73

#### 2. Three Levels

Intermodality does not aim or relate to a specific modal split, but addresses the integration of modes at three levels: <Table 4>

- (1) infrastructure and transport means (“hardware”),
- (2) operations and the use of infrastructure (especially terminals), and
- (3) services and regulation (from a modal-based to a mode-independent framework).

<Table 4> Key Actions towards Intermodality

Integrated infrastructure and transport means
- Intensify intermodal design of the trans-European transport networks
- Enhance design and functions of intermodal transfer points
- Harmonize standards for transport means
Interoperable and interconnected operations
- Integration of freight freeways in an intermodal context
- Development of common charging and pricing principles
- Harmonize competition rules and state aid regimes on an intermodal basis
Mode-independent services and regulations
- Harmonization and standardization of procedures and EDI
- Intermodal liability
- Research and demonstration
- Benchmarking
- Intermodal statistics

Source : EC (1997). 7.

### 3. Promoting Intermodal Transport

The promotion of Intermodality is a policy tool enabling a systems approach to transport. An efficient transport system is an essential prerequisite for the European Union's competitiveness. There is scarcely a single European transport plan which does not make the promotion of combined transport an essential objective. It expressly states that the progressive integration of the different modes, and hence intermodal transport, will bring the maximum benefits, both economic and environmental (Hanreich, 1996).

Both the Member States and the EC widely apply the policy of promoting intermodal transport. Various policy measures and projects are intended to create an awareness of the capabilities and advantages of intermodal transport among potential customers. The main objectives of intermodal transport promotion are to create an awareness among all parties of the possibilities for cooperation between transport modes and to establish virtual portals for all intermodal modes.

As far as information system is concerned, many national and international projects have been initiated to develop, test and install such information systems. A European initiative to create a global satellite navigation system, Galileo is an ongoing project of the TEN-T. The uniqueness of Galileo is its specific design for civilian use worldwide and its freely available open services.

### 4. Obstacles

A number of obstacles have been identified which prevent the extensive use of intermodal transport. These include the lack of a coherent network of modes and interconnections, the lack of technical interoperability between and within modes, a variety of regulations and standards for transport means, data-interchange and procedures. There are uneven levels of performance and service quality between modes, different levels of liability and a lack of information about intermodal services. As a result, mode-independent door-to-door transport is underdeveloped.

Since public policy concerns vary in intensity between different Countries and regions in Europe the development of continent wide solutions is very difficult to implement. These require, in addition to a package of measures which reinforce each other at national level, a degree of international co-ordination and cooperation which is not always easy to obtain. However, the success of policy aspirations to make more use of alternatives to road depends on how well the public and private sectors can combine their interests and expertise (Short, 2002).

The Commission will undertake activities to promote the opportunities for intermodal transport and raise the awareness of the relevant bottlenecks to be eliminated. It will increase its support to the development of competitive intermodal transport solutions through positive actions such as the financing of research and demonstration projects. The market must be able to identify and exploit these opportunities, and intermodal transport policy must eliminate any bottlenecks which may prevent operators from realizing such opportunities.

### 5. Intermodal Transport Strategies

A world-wide trend towards reduction of policy interventions (deregulation, privatisation, etc) has strengthen and stimulated important transport markets such as Europe, USA and Canada. Under such conditions, traditionally protected positions have been challenged and many actors had to find the appropriated "market-survival" strategies on the basis of their own strength. In such a context, complex network configurations have emerged as promising options for market survival as well as for developing creative competitive behaviour (Reggiani et al., 2000).

Implementing a European intermodal transport system requires co-ordinated development of transport policy on European, national and regional level. Some strategies such as internal market: liberalisation and harmonisation, the international dimension, infrastructure, common technical standards, modern innovations in information technology, one-stop service, motorways of the sea, will provide the necessary impetus to the development of intermodal transport in the overall context of the Common Transport Policy (ECTRI, 2006).

### 6. Challenges and Co-operation

The main challenge will lie with the market, namely to organize seamless and customer-oriented door-to-door transport services which draw on the strengths of all modes and which make use of all transport infrastructure and capacities.

The challenge for policy makers is to provide a policy framework for an optimal integration between transport modes. Interoperability and interconnectivity will enhance the efficient and effective use of transport infrastructure and capacity. This will facilitate customer-oriented door-to-door transport services which draw on the strengths of each mode.

The challenges of the transport system brought about by the future development of the EU are (Ogorelc, 2003):

- Economic growth will automatically cause an increase in the need for mobility,
- EU expansion will cause an explosion of traffic flow in the new member states,
- Huge investment in infrastructure due to saturation of main transport road in EU caused by the less developed new member states.

### 7. Cases

#### 7.1. TEN-T

##### 7.1.1. Transport Infrastructure

Establishing an efficient Trans-European Network of Network (TEN-T) is a key element in the relaunched Lisbon strategy for competitiveness and employment in Europe. If Europe is to fulfil its economic and social potential, it is essential to build the missing links and remove the bottlenecks in our transport infrastructure, as well as to ensure the sustainability of our transport networks into the future.

Furthermore, it integrates environmental protection requirements with a view to promoting sustainable development.

In view of the growth in traffic between Member States, expected to double by 2020, the investment required to complete and modernise a true trans-European network in the enlarged EU amounts to some € 500 billion from 2007 to 2020, out of which € 270 billion for the priority axis and projects. Given the scale of the investment required, it is necessary to prioritise projects, in close collaboration with national governments, and to ensure effective European coordination.

The European Community is supporting the TEN-T implementation by several Community financial instruments and by loans from the European Investment Bank.

7.1.2. Mid-Term Review 2007-2013

A mid-term review of the 2007-2013 multi-annual work programme (MAP) was carried out to see if objectives were being met and to ensure value for money was being achieved. This so-called MAP project portfolio review was based on a review of the progress of individual projects. These projects include some of the most ambitious and complex ones across Europe as well as long-term projects with specific and exceptional difficulties.

The mid-term review looked at a total of 92 projects selected under the 2007 calls for proposals and which were originally foreseen to be completed by the year 2013. The 92 projects account for approximately two-thirds of the total TEN-T budget (€5.301 billion out of a total €8.013 billion) and 78% of the total MAP for the entire 2007-2013 period. The total budgeted cost of these projects is €32.647 billion. Therefore, the TEN-T budget accounts for approximately 16% of the projects' budgeted costs. For the assessment, review panels composed of external experts and internal experts from European Commission services evaluated each individual project to see if any further action was needed. An internal review panel was established to analyse these findings (European Commission, 2010b).

8. Marco Polo Programme

8.1. Marco Polo II (2007-2013)

The Marco Polo programme, entered into force in 2003, directly subsidizes intermodal operations. Marco Polo II includes new actions such as motorways of the sea and traffic avoidance measures. The programme, which will have a budget of €400 million for 2007-2013, has been extended to countries bordering the EU <Table. 5>. There will be yearly calls for project proposals. In principle, each call will be published in the last quarter of every year and be closed in the first quarter of the following year.

Five distinct types of action will be supported (European Commission, 2011):

- Modal shift actions, which focus on shifting as much freight as economically meaningful under current market conditions.
- Catalyst actions change the way non-road freight transport is conducted in the Community.

- Motorways of the sea actions achieving a door-to-door service
- Traffic avoidance actions integrate transport into production logistics
- Common learning actions enhance knowledge in the freight logistics sector

<Table 5> Actions and Support Conditions

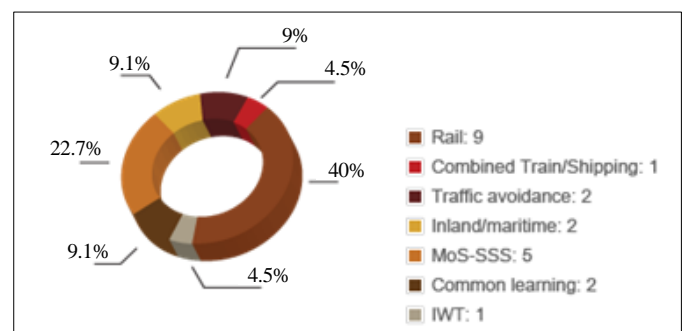
Aid to start-up services	- 1 Euro subsidy per 500 t-km shifted - min subsidy 0.5 million Euro (Subsidy up to 30%) - ancillary infrast. 20% (Subsidy up to 3 years, viable after subsidy)
Overcome structural barriers	- innovative - min subsidy 1.5 million Euro (Subsidy up to 35%) - ancillary infrast. 20% (Subsidy up to 4 years, viable after subsidy)
Co-operation, sharing of knowhow,mutual training	- min subsidy 0.25 million Euro (Subsidy up to 50%, Subsidy up to 2 years)

Source : Burkhard & Toshinori (2005). 6.

8.2. Marco Polo in Action

Over the period 2003-2009, 125 projects involving more than 500 companies have received funding from the Marco Polo programme. Between 2003 and 2006, 55 projects have been financed. The subsidies reduce the high financial risks of market players during the start-up phase of new intermodal transport services. Furthermore, incentives are given to develop innovative solutions for using intermodal transport.

Under the 2009 call for proposals, 22 projects were successful - from 70 bidders for the budget of €66.34 million. Rail was the most popular alternative to road transport, accounting for nine projects and 40.7% of the shift, followed by sea routes (five projects and 22.7% of the shift). <Figure. 1>



Source : European Commission (2010a). 1.

<Figure 1> Proposals by Mode, Call 2009

Of the 22 projects, 15 were modal shift actions, i.e. robust, but not necessarily innovative projects which take freight off the roads. Two were catalyst actions which will change the way non-road freight is transported. Two were common learning actions i.e. they innovate in ways of dealing efficiently and sustainably with increasingly complex transport and logistics solutions. Two were traffic avoidance

actions, which integrate transport and production. One was a motorway of the sea action i.e. an action offering a door-to-door service by combining short-sea shipping services with other modes of transport, preferably rail and inland waterways.

## IX. CONCLUSION

Intermodality is crucial to sustainable transport policy in Europe. The key element of European intermodal policy can be overviewed with infrastructure, technology and standards and rules, and policy and regulatory framework comes from white paper on the future of the common transport policy 1992 to communication on the greening transport 2008. Obstacles can be identified, that is, lack of coherent network of modes and interconnections and the lack of technical interoperability between and within modes, etc.

It has been required that strategic approaches of intermodality to secure market-survival strategies under reduction of policy intervention. As for European intermodal transport policy, it is important that proper TEN-T should be established, which is strongly involved with both network set-up in infrastructure and abolition of obstacles. It is also a way of assuring a sustainability of future transport network. However, Marco Polo that is newly promotion programme for intermodal transport has been launched in year 2001, with annual budget of around EUR 30 million, which could be spread over four years. This programme will be open to proposals to shift freight from road to environmentally friendly modes.

As far as the implication the EU intermodal policies are concerned, sustainable approaches by the EU should be noticed and lessoned to other countries that is in pursuit of such a intermodal policies as an alternative future transport modes. Therefore, it can be said that Europe has continuously made a efforts to policy concerns and approaches, together with promotion of sustainable intermodal transport.

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