

Ex ante Evaluation

Marco Polo II (2007-2013)

Final Report-1

Client: European Commission, DG TREN

ECORYS Transport

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Abstract

The current Marco Polo programme (2003-2006) lays the foundation for the new Marco Polo programme (2007-2013), as the new programme continues to address the issue of constraining international road freight transport through effective short-term intervention (mainly 3-4 years project support duration, with lasting effects) by the use of practical logistics services projects. The nature of the programme, providing risk-reducing subsidies to market driven services, making the programme a typical Public private Partnership, will remain.

The new Marco Polo programme refocuses itself from a pure modal shift actions programme to an innovative actions programme. This is driven by the fact that traditional Modal Shift action project opportunities will be gradually exhausted; the good projects are selected first, next projects provide less marginal benefits. Therefore, the new programme calls for a new approach in which infrastructure funding is allowed for Catalyst Actions, and three new type of actions are defined (Motorways of the Sea, Rail Synergy and Traffic Avoidance), all with a highly innovative profile. Also for these three actions, infrastructure funding is allowed. Including infrastructure funding makes the programme more expensive (total required budget is some 820 million euro for the programme period), however, without infrastructure funding the programme would not attract the innovative projects from the market that are needed to deliver the programme's objective of shifting 144 billion tonne-kilometres off the road.

The programme is expected to provide value for money through delivering its objectives (at a rate of 176 tonne-kilometres shifted per euro) and at the same time by providing saving in externalities at a level of almost 5 billion euro.

Marco Polo provides European Added Value through its complementarity to and coherence with national Member States' and other Commission's programmes. The member State programmes primarily focus on domestic transport, infrastructure provision and do not concentrate on international co-ordination, providing a strong match with Marco Polo's focus. An example of other Commission's programme complementarity is the relationship between Marco Polo and the Trans European Networks programme (TEN-T) programme. Marco Polo, market driven, focusing on services, with a short-term horizon especially is complementary to the TEN-T programme, with a long-term horizon, providing the infrastructure of which the services as supported in Marco Polo will make use.

Executive summary

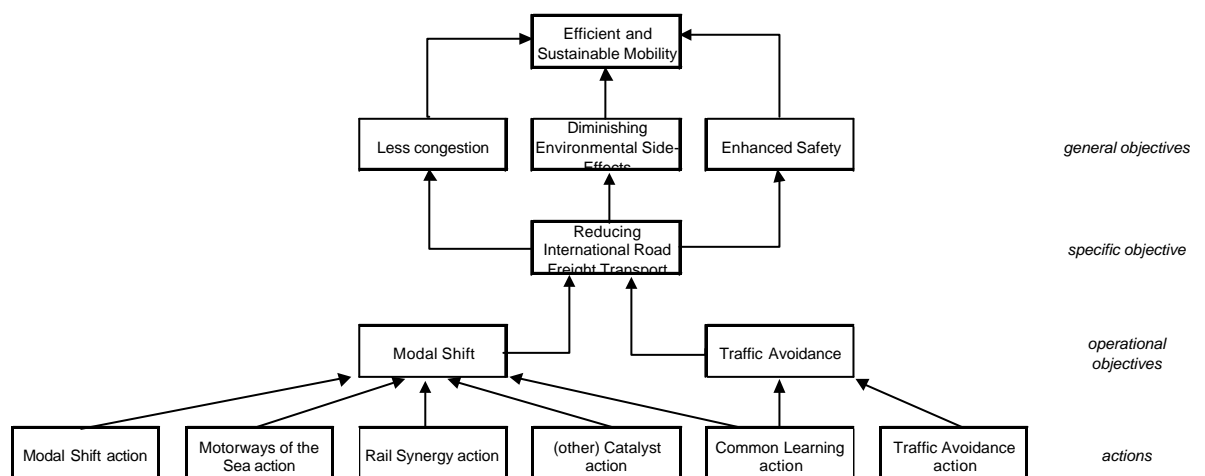
Road freight transport comes with negative side-effects and EU policy is aimed at reducing these effects ...

In an open European ‘flow’ economy freight transport is essential. Nevertheless, road freight transport is generally acknowledged to contribute to worsening congestion, a disproportionate number of accidents and damage to the environment. EU policy, as defined in the EU White paper ‘European Transport Policy for 2010: Time to Decide’, is aimed at shifting the balance of transport, amongst others through stimulating alternative modes of transport, i.e. rail, inland waterways and short sea transport.

Marco Polo II contributes to a shifted balance by shifting freight off the road ...

The *general objective* of the Marco Polo II programme is to reduce road congestion, enhance traffic safety and to improve the environmental performance of the freight transport system within the Community, thereby contributing to an efficient and sustainable transport system. The *specific objective* of the Marco Polo II programme is to shift at least the expected increase of international freight transport in the period 2007-2013 off the road.

Two main ways of delivering this specific objective are identified: modal shift and Traffic Avoidance Actions. The Marco Polo II programme defines six actions: (i) Modal Shift Action, (ii) Catalyst Action, (iii) Common Learning Action, (iv) Motorways of the Sea Action, (v) Rail Synergy Action and (vi) Traffic Avoidance Action. An overview of the relationship between the general objectives, specific objective and the six defined actions is presented below.



Scope determining aspects of Marco Polo II are:

- Marco Polo II covers the period 2007-2013.
- The main geographic scope of Marco Polo II is EU-25, i.e. the current 25 EU Member States. Additional countries can fully participate in Marco Polo II upon signing bilateral agreements.
- Marco Polo II is aimed at providing assistance in the form of risk reducing subsidies to bottom-up logistic services. Infrastructure funding can be part of the assistance in cases where this infrastructure is supporting the logistic services.

Marco Polo II is the successor of PACT (Pilot Actions on Combined Transport, 1997-2002) and Marco Polo I (2003-2006). Marco Polo II is broader in scope than its predecessors, both in terms of country coverage and type of actions included in the programme.

The *main programme indicator*, related to the specific and operational objective and the driving force for each of the actions defined, is the amount of tonne-kilometres¹ shifted off the road. Marco Polo II aims to shift at least 144 billion tonne-kilometres off the road in the period 2007-2013.

The new Marco Polo programme shifts its focus to innovation...

The new Marco Polo programme builds on experiences from the previous programmes and at the same time refocuses itself from pure modal shift actions to more innovative actions. This is driven by the fact that there is a saturation effect in modal shift actions; the good projects are selected first, next projects provide less marginal benefits. Therefore, under the new programme infrastructure funded is allowed in the Catalyst Action, which is innovation driven. Furthermore, three new actions have been defined, all with a highly innovative profile. Also for these three actions, infrastructure funding is allowed. Including infrastructure funding makes the programme more expensive, however, without infrastructure funding the programme would not be able to reach its objective of shifting 144 billion tonne-kilometres off the road.

Marco Polo II fills a market niche ...

Marco Polo II seeks to develop practical multi-modal and traffic avoidance applications within the total transport domain, which are capable of replication. It is specifically addressing the issue of constraining *international road freight transport* through effective *short-term intervention* (mainly 3-4 years project support duration, with lasting effects) by the use of *practical logistics services projects* using intermodal technologies and traffic avoidance measures. The nature of the programme, providing *risk-reducing subsidies* (with state contribution at a maximum rate of 35 percent, leaving the remainder of investment to be covered by the private sector), makes the programme a typical Public private Partnership. By doing so, Marco Polo II fills a market niche (international road freight, short-term, bottom up logistics services) and provides a funding opportunity for projects, which have limited access to financial support from national Governments, given their tight financial positions.

¹ Tonne-kilometre is defined as the transport of a tonne of freight, or its volumetric equivalent, over a distance of one kilometre.

Marco Polo II has been reviewed against a series of alternative delivery mechanisms and risk categories and has, as currently conceived, significant intrinsic strengths. Marco Polo II is intended as a robust, practical and focused programme, which builds on the existing Marco Polo programme and has the merit of expanded scope to achieve the key objectives.

Marco Polo II is complementary to and coherent with related Member States' and EU programmes ...

Comparing Marco Polo II with relevant *Member State programmes* results in the notion that Marco Polo II is coherent with the national programmes and that there is no sign of contra-productivity or large conflicts of interest:

1. The majority of Member State programmes aim at national objectives and do not take into account the added value of international coordination.
2. Marco Polo II is focusing on shifting international freight transport off the roads; this is complementary to most of the national programmes, focusing on domestic transport.
3. Furthermore, and given the fact that the potential for modal shift/intermodal transport is higher for longer (mostly international) transport chains in Europe, there is a need for a European intervention. It cannot be expected that the Member States will take up all the required action for these opportunities.
4. There is a risk for duplication, since a large amount of effort within the national programmes is spent on the same (notably modal shift) type of projects.
However, this risk can be dealt with within the framework of the Marco Polo II.

The new Member States, facing a declining rail transport market share and a rapidly developing road transport sector, may benefit from opportunities provided by Marco Polo, which could contribute to a revitalisation of the rail sector.

Marco Polo II is coherent with and complementary to *other EU initiatives*:

- The Marco Polo II programme is part of the *integral approach toward transport*; as presented in the *White Paper*, and is complementary to other measures proposed in the *White Paper*.
- The *Trans European Networks (TEN-T)* programme focuses on the development of roads, railways, inland waterways, airports, seaports, inland ports and traffic management systems in order to strengthen the creation of the Internal Market and reinforce Economic and Social Cohesion within the Union. The basic differentiation between Marco Polo and TEN-T funding is the intrinsically different nature of the two instruments. TEN-T is an instrument to construct a European infrastructure network, with long-term goals such as development of the internal market and economic and social cohesion. These considerations are largely absent from Marco Polo. Marco Polo is a market-oriented, demand driven instrument focussing on sustained modal shift achieved by transport services. Projects financed under Marco Polo are less costly and their implementation period is much shorter compared to TEN-T projects. The construction of a railway tunnel, for instance, across the Pyrenees, would take at least 15 years and cost several billion euros compared to a maritime service co-financed in the framework of a Marco Polo – Motorways of the Sea project. The beneficiaries of Marco Polo are exclusively undertakings striving to achieve short- and mid term commercial goals. Economic operators relying largely on

their own commercial initiative to set up new services for economic gains will naturally turn to Marco Polo and have the necessary infrastructures co-funded by this instrument.

- As for *Motorways of the Sea*, the White Paper states that ‘certain shipping links, particularly those providing a way around the bottlenecks in the Alps and Pyrenees, should be made part of the Trans European Networks, just like motorways or railways’. The TEN-T programme, on the one hand, should ensure hinterland connections from and to the ports, integrating the Motorways of the Sea into the TEN-T. On the other hand, Marco Polo, by supporting intermodal services to make use of the Motorways of the Sea, will contribute to raising a sufficient traffic volume to validate the Motorways of the Sea.
- The *Research Framework Programmes* and Marco Polo II can also be seen as complementary programmes. The Research Framework Programmes focus on long-term development of (technological) solutions, Marco Polo II on the short-term implementation of new concepts (for which the Research Framework Programmes may have laid the basis).

Marco Polo II needs approximately 820 million euro to meet its objective...

The objective is to shift in the period 2007-2013 the expected increase of international road freight transport, equalling *144 billion tonne-kilometres*, off the road. In the assessment of the required Marco Polo II budget the following aspects play an important role and have a substantial influence on the outcomes:

1. Number of specific projects per action expected each year.
2. Number of expected tonne-kilometres shift per project.
3. Success rate of projects recommended for funding.
4. Subsidy per tonne-kilometre of shift.
5. Infrastructure cost per specific project.
6. Percentage of Commission funding of infrastructure.

The next table presents the Marco Polo II budget calculations.

Actions	Tonne -kilometre		Costs			
	Tonne -kilometre-shift (Billion)	Share in objective	EC subsidy services (mio EUR)	EC subsidy infrastruct. (mio EUR)	Total EC-subsidy (mio EUR)	Share in costs
Modal Shift	57.5	40%	153.3	0	153.3	19%
Catalyst	23.6	16%	63.0	111.6	174.6	21%
Common Learning	-	-	15.2	0	15.2	2%
Motorways of the Sea	42.0	29%	168.0	151.4	319.4	39%
Rail Synergy	10.5	7%	42.0	61.8	103.8	13%
Traffic Avoidance	10.5	7%	35.0	18.9	53.9	7%
Total	144.1	100%	476.5	343.7	820.1	100%

The above indicates that approximately 820 million euro (117 million euro per year) is needed to deliver the Marco Polo II objectives in tonne-kilometres. Strong objective contributing actions are Modal Shift and Motorways of the Sea actions (together 69%).

Motorways of the Sea, Catalyst and Modal Shift actions together account for almost 80% of the Marco Polo II budget.

Marco Polo II has significant indirect impacts, including a substantial reduction of externalities....

Besides the direct impact in terms of tonne-kilometres, as indicated above, Marco Polo II results in a range of indirect impacts: air pollution, global warming, noise, traffic safety (accidents), congestion infrastructure, economic, social, competitiveness, crime and terrorism. Results per type of impact are presented below.

Air pollution, global warming, noise, traffic safety, congestion and infrastructure impacts are quantified, using marginal costs estimates from former DG TREN research (UNITE, RECORDIT, REALISE) and other sources (INFRAS/IWW, OECD). The analysis results in Marco Polo II having a positive impact on reduction of externalities of 4.98 billion euros. The reduction in externalities is approximately 76% (as compared to the situation without Marco Polo II). It should be noted that the external impacts are not restricted to the period 2007-2013; the impacts are also valid beyond the year 2013. Therefore the calculated impacts represent the *minimum value*, the actual impacts are higher.

Economic impacts: in relation to economic activities the following key points are presented as positive impacts from the Marco Polo II initiatives: reduced mono-modal transport dependency, energy efficiency gains and reduced excessive reliance on liquid hydrocarbon fuels for freight transport, new market options and commercial market stimulation/innovation to support more diverse inter-modal services and service structures, reduced congestion for remaining freight and passenger traffic and de-coupling of transport growth from economic development. Possible negative economic impacts could include risk of loss of EU economic growth during the transition from mono-modal to multi-modal options and negative impact on road transport manufacturing base and supporting sectors.

Employment: Marco Polo II is expected to shift employment from the road sector to alternative modes of transport, both through a direct effect (road haulage sector to alternative modes) and indirect effect (supporting industries, e.g. from truck producers to producers of rolling stock and shipyards). The net effect is determined by productivity per sub-sector and location of industries and given the multitude of effects and the different directions of effects, size of the net effect is unknown. It should be noted that Marco Polo II intends to shift the future increase in road transport to other modes of transport, leaving the current road transport sector employment opportunities intact, while creating opportunities in other modes of transport.

Competitiveness: Marco Polo II scores a green light on the competitiveness' traffic light test. Possible *negative aspects*, such as an increased compliance costs and administrative burdens through tendering and monitoring and evaluation processes and regional economic and social impacts through a redistribution of activities from the road sector to alternative modes of transport, are offset by expected foreseen *positive aspects*, such as lower transportation costs. These are likely to have a positive impact on production costs and positive spill-over effects to other sectors, contributing to innovation within the

transportation sector and contribution to development of the internal market through the international character of the programme

Crime and terrorism: International freight transport is not free from criminal activities, making Marco Polo II potentially vulnerable for crime and terrorism. Again, it should be noted that Marco Polo II is focusing on shifting future growth in international road freight transport off the road, to be replaced (for the vast majority) by alternative modes of transport, i.e. rail, inland waterways and short sea shipping. Some sub-sectors may provide opportunities for criminal actions, e.g. trafficking in short sea shipping, but at the same time, the more rigid nature of these alternative modes of transport, with fixed nodes (rail stations, ports), provides prospects for better controlling movement of freight flows. It is therefore recommended that projects under Marco Polo II should incorporate crime-preventing measures, e.g. fencing, scanning devices, etc in project design, minimising risks related to crime and terrorism.

Marco Polo II provides value for money ...

A cost effectiveness analysis has been carried out, relating direct impact of Marco Polo II (tonne-kilometre shift) and indirect impacts (quantifiable external benefits, as presented above) to required Marco Polo II budget. With a budget of approximately 820 million euro, 144 billion tonne-kilometres are shifted off the road and a total amount of 4.98 billion euro in externalities is saved. This results in the following cost effectiveness ratios:

- *Tonne-kilometre shift per euro subsidy: 176*
- *External benefits per euro: 6.07*

The tonne-kilometre shift per euro of Marco Polo II and external benefits per euro are lower than in previous programmes (PACT and Marco Polo I), because:

- *Costs* of Marco Polo II as compared to its predecessors, are at a substantial higher level, as infrastructure funding is included for the majority of the defined actions. In order to achieve the objectives, with relatively less attractive projects, as compared to the first projects of Marco Polo I, investing in infrastructure to support the enhancement of intermodal services is essential. This is reflected in the three new actions, while infrastructure funding in Catalyst Actions is also permitted.
- *The marginal revenues of tonne-kilometres shift* are reduced with the programme expansion through the principle of ‘most attractive project selected first’. This especially applies to the ‘old’ actions; the new actions provide potential for tonne-kilometre reductions, but are simply more expensive, as infrastructure funding is included.

The essential point here is that the objective of shifting the growth in international road freight transport off the road, could not be achieved by continuation of Marco Polo I, as under the ‘old’ programme, based on three actions, an insufficient number of feasible projects would be available. Marco Polo II, with its expansion in new actions that include infrastructure funding and upgrading Catalyst Actions by allowing infrastructure funding to be included, will result into significant higher overall impacts, whereas the costs increase substantially as well. This is however justified, as otherwise the objectives in terms of tonne-kilometre shift, could not be reached.

Need for practical monitoring and evaluation system, focusing on tonne-kilometres reduction ...

In monitoring of the Marco Polo II programme a balance is to be struck between the need for monitoring information and the administrative requirements for applicants, knowing the maximum size of the subsidy that can be expected.

The following formal instruments are proposed:

- Progress Reports (twice a year) during the implementation of the action, focusing on efficiency and effectiveness of implementation.
- A Project Completion Report upon finalization of the action.
- Annual Additional Progress Reports, focusing on the impact of the transport services in particular in terms of the main indicators, during three years after completion of the action.

These reports are to be submitted by the applicants to the programme management of Marco Polo II. The reports will have a standard format including a standard set of monitoring indicators, which facilitates storing the results in a database kept by the programme management.

Marco Polo II size and scope requires strong programme management ...

As Marco Polo is expected to have annual calls with applications in the range of 120-150 per call, out of which some 50 projects are selected for Marco Polo II funding, the administrative burden on programme management will increase. This effect is reinforced by the multitude of possible actions, the opportunity of infrastructure funding and the inclusion of the ten new Member States. The current size of the Marco Polo team (three officials, secretariat not included) is not considered sufficient to cope with the future tasks. Total required programme management staff (officials) is estimated at some 12-14 persons, equalling a span of control of a little less than 15 projects per person. Most programme management activities are to be carried out by Commission staff; outsourcing is not recommended given the confidential character of the activities to be carried out and the expected loss of efficiency in the work as a result of spreading project activities over more than one person.

A challenge for Marco Polo II management is to simplify management procedures in order to minimise the administrative burden, both at Commission and at contractor's level. The fact that ten new Member States have joined, also calls for simple procedures. At the same time, in order to retain Marco Polo's attractiveness, the chances for successful project applications should be significant, not dropping below 20-25 percent.

In order to attract sufficient response from the market, which is needed given the ambition level of the programme, Marco Polo management should consider strengthening its public relations activities and creating awareness for the opportunities of the 'new' Marco Polo programme. The following measures have been taken to improve public relations: organisation of an Info Day (prior to the second Call), an all-year available Help Desk, the establishment of a website, establishing Contact Points at each Member State and organising seminars in all Member States. These activities should contribute to improved awareness of the programme.

1 Introduction

1.1 Background

The Directorate General for Energy and Transport (DG TREN) is designing and preparing the proposal of the Commission for the renewed multi-annual Community programme in the field of transport, the Marco Polo II programme for the period 2007-2013. This proposal aims at updating the current Marco Polo programme, which has been approved by the European Parliament and Council decision 1382/2003 of 22 July 2003.

Part of the procedure towards getting the Marco Polo II proposal accepted is to carry out an ex ante evaluation. Through a dedicated Framework Contract on Impact Assessment and Ex ante Evaluations, DG TREN has approached the consortium led by ECORYS to carry out the ex ante evaluation for Marco Polo II.

This report builds on to the results presented in the two Interim Report. These two Interim Reports were thoroughly discussed with the Commission, providing a solid basis for the Draft Final Report. Guidelines on ex ante evaluation and impact assessment have been used as a guiding principle for the ex ante evaluation.

1.2 Objective of Marco Polo II ex ante evaluation

The objective of the Marco Polo II ex ante evaluation, as outlined below, is as defined in the Specification of Services:

‘Analyse the available policy options and their different impacts, measure and compare potential impact with relevant and credible indicators, assess the risk and uncertainty of the assumptions and provide a cost-opportunity analysis of the Community financial intervention in order to demonstrate its added values.’

1.3 Definitions and focus of Marco Polo II

In this section a number of aspects are defined, determining the focus of Marco Polo II.

Type of activities under Marco Polo II

Marco Polo II is aimed at providing assistance in the form of risk reducing subsidies to bottom-up services aimed at getting at least the expected increase of international freight transport off the road through a modal shift to rail, inland waterways and short sea or through traffic avoidance.

Six type of actions are defined in Marco Polo II, Modal Shift Actions, Catalyst Actions, Common Learning Actions, Motorways of the Sea, Rail Synergy and Traffic Avoidance, of which the second and the latter three could include the funding of infrastructure.

Geographic scope

The main geographic scope of Marco Polo II is EU-25, i.e. the current 25 EU Member States. For analytical purposes two other programme coverages are used:

- EU-15: the 15 EU Member States prior to the accession of the 10 countries per May 1st 2004. This mainly to facilitate a comparison with PACT and Marco Polo I (first call).
- EU-25+: this is EU-25 and Bulgaria and Romania and the EFTA².

Additional countries can participate in Marco Polo II once a bilateral agreement between the country and Marco Polo II is signed.

Time horizon

Duration of Marco Polo II is 7 years (2007-2013), during which a call for proposals is expected each year.

1.4 Methodology

Methodology

The methodology of the Marco Polo II ex ante evaluation is based on the European Commission document *ex ante evaluation – a practical guide for preparing proposals for expenditure programmes*. This document provides a complete overview of steps to be carried out. For specific, more in-depth guidelines on impact assessment, use is made of the document *a handbook for impact assessment in the Commission – How to do an Impact Assessment*. Annex 1 provides an overview of all documentation used as input for the evaluation.

Approach

Given the short project duration, a focused step-by-step approach is followed, based on a two-week reporting cycle, followed by a meeting with the Commission. Milestones are presented in Table 1.1.

Consultants have co-operated closely with DG TREN experts involved in Marco Polo and Marco Polo related areas. A stakeholders' consultation exercise is carried out as part of the ex ante evaluation. Main stakeholders identified are representatives of modal or sub-sector associations. An overview of stakeholders is included in Annex 9.

² The EFTA countries included are Norway, Liechtenstein and Iceland, who jointly signed an agreement with Marco Polo on April 23rd 2004. Switzerland has not signed the agreement and is therefore excluded from the group EU-25+.

Table 1.1 Milestones of Marco Polo II ex ante evaluation

Activity	Time
Project commencement	15 April 2004
Kick-off meeting	20 April 2004
First mid-term Report	30 April 2004
Meeting in Brussels	4 May 2004
Second mid-term Report	13 May 2004
Meeting in Brussels	14 May 2004
Draft Final Report-1	27 May 2004
Meeting in Brussels	28 May 2004
Draft Final Report-1	3 June 2004
Comments by Commission	8 June 2004
Final Report-1	15 June 2004
Standby for incorporating comments and delivering	Period June-September
Final Report-2	

1.5 Contents of the report

The second chapter (problem analysis and needs assessment) and third chapter (objectives and indicators) are interrelated; the second chapter provides the foundation for the Marco Polo II programme, which is spelled out in more detail in the third chapter. The fourth chapter focuses on alternative delivery mechanisms and risk management and the fifth chapter on European Added Value. The sixth chapter provides lessons from the past, both from Marco Polo II's predecessors, PACT and Marco Polo I, and related initiatives. The seventh chapter presents the results of the stakeholders' consultation.

Budget calculations are carried out in chapter 8, providing a basis for the impacts of the preferred Marco Polo II programme that are analysed in chapter 9. Results of budget calculations and impact assessment are feeding into cost effectiveness analysis in chapter 10. Chapter 11 provides insight in monitoring and evaluation requirements for Marco Polo II and chapter 12 focuses on Marco Polo II programme management.

2 Problem analysis and needs assessment

2.1 Problem analysis

In an open European ‘flow’ economy freight transport is essential. The basic rationale of the public Marco Polo II programme is to reduce a number of negative side-effects of the road dominated position:

- Contribution of (road) freight transport to congestion.
- Environmental (and noise) effects of road freight transport.
- Disproportionate number of accidents involving freight transport vehicles.

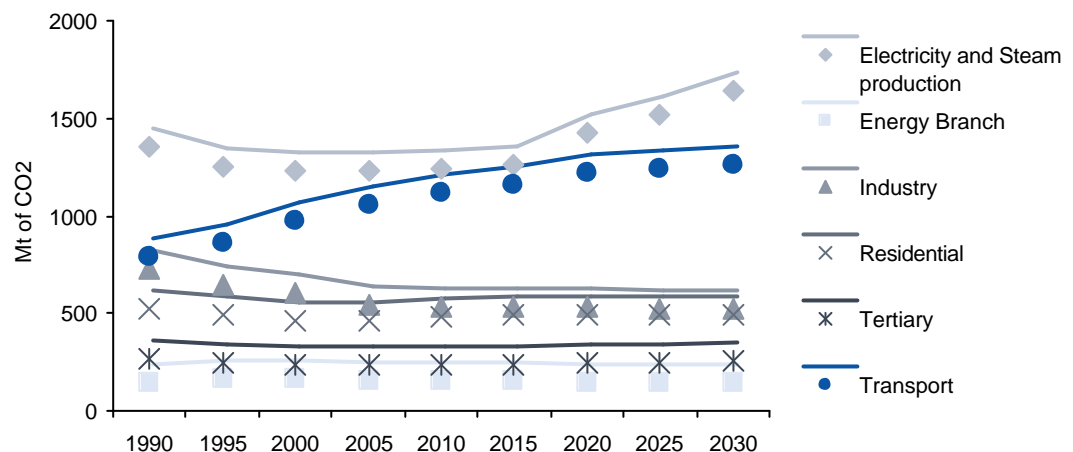
Congestion

Most of the congestion affects urban areas. According to the White Paper *European transport policy for 2010: time to decide* also the Trans European Networks (TEN-T) suffers increasingly from chronic congestion: some 10 % of this road network is affected daily by traffic jams; costs of road traffic congestion amount to 0.5 % of Community GDP. Traffic forecasts for 2010 imply that the costs attributable to congestion will relatively double to approximately 1.0 % of Community GDP.

Environment

Transport will cause a substantial and increasing part of total CO₂ emissions in Europe, i.e. some 30% in 2030 (in current 25 Member States).

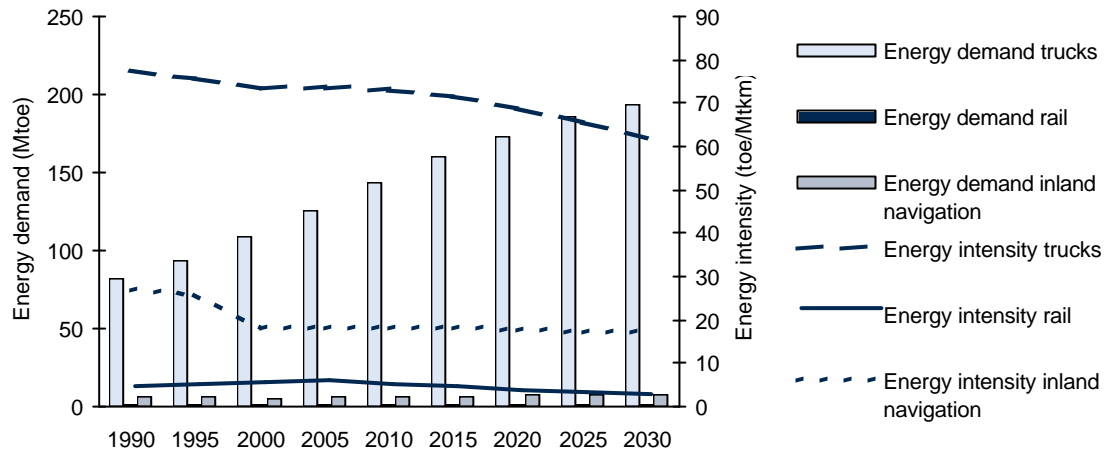
Figure 2.1 CO₂ emissions by sector in EU-25



Source: European Commission (DG for Energy and Transport), *European Energy and Transport Trends to 2030*

The amount of CO₂ emissions is closely related to the energy demand. Within freight transport the energy demand of all trucks in 2000 was about 15 times higher (in 2030 increasing to 22.8) than rail transport and inland navigation together. Not only total energy demand but also the energy intensity of road haulage is far higher than for rail and inland waterway transport.

Figure 2.2 Energy demand (Mtoe) and energy intensity (toe/Mtkm) of freight transport in EU-25

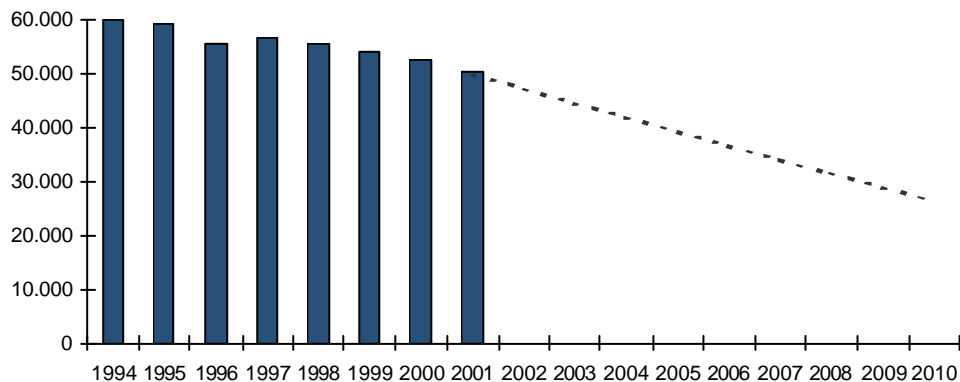


Source: European Commission (DG for Energy and Transport), *European Energy and Transport Trends to 2030*

Accidents

Though the number of deaths is decreasing, road accidents still killed over 50 000 people in the European Union in 2001. The White Paper *European transport policy for 2010: time to decide* made the following comparison: “Every year the number of deaths on the roads is equivalent to wiping a medium-sized town off the map. Every day the total number of people killed on Europe’s roads is practically the same as in a medium-haul plane crash.” As a result, road accident victims, the dead or injured, cost society tens of billions of euro on an annual basis. Figure 2.3 presents the number of traffic fatalities.

Figure 2.3 Number of traffic fatalities in EU-25



Source: CARE (historical figures); target level derived from European Commission (European road safety action Programme), *Halving the number of road accident victims in the EU by 2010: A shared responsibility*

2.1.1 Key aspects

In general, the negative side-effects of the transport system deal generally with infrastructure, technology aspects, behaviour of drivers and the amount of traffic.

Figure 2.4 Drivers for negative side-effects of transport

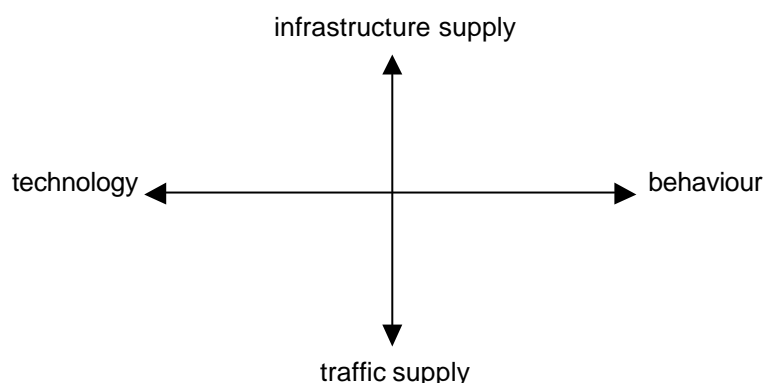


Table 2.1 General factors causing negative side-effects of transport

	Congestion	Environmental effects	Accidents
Infrastructure	Infrastructure capacity is too small to cope with traffic quantity (at certain times)	Infrastructure surface vehicle interaction causes negative side-effects	On road infrastructure there is no separating of users with different speeds and other kinds of safety design issues; low enforcement of law
Technology	Current vehicle technology prevents a more efficient use of infrastructure.	Vehicles have a substantial energy consumption, cause harmful emissions and make noise	Vehicles are not equipped with (all) available safety measures (camera's, mirrors etc.)
Behaviour	Inflexibility in working times and opening times (including "bans" during certain times of the day) prevents spreading transport over time	Traffic behaviour enlarges negative side-effects (energy consumption, harmful emissions and noise)	Many accidents deduced from traffic behaviour and low drivers skills and training (traffic speed)
Traffic supply	Demand for (road) transport itself is too large to cope with infrastructure capacity (at certain times)	Amount of (road) transport creates many adverse side-effects	Amount of (road freight) transport causes disproportionate accidents

Consequently, with infrastructure, vehicle and behaviour measures public policies can constrain the negative side-effects of (freight) transport. A fourth general measure is to reduce transport demand. The challenge is to do this without disturbing the long-term competitiveness of the European economy and to manage the impact of change.

The Marco Polo II programme focuses on reducing road freight transport. Reducing freight transport without disturbing the competitiveness of the European economy is possible by means of:

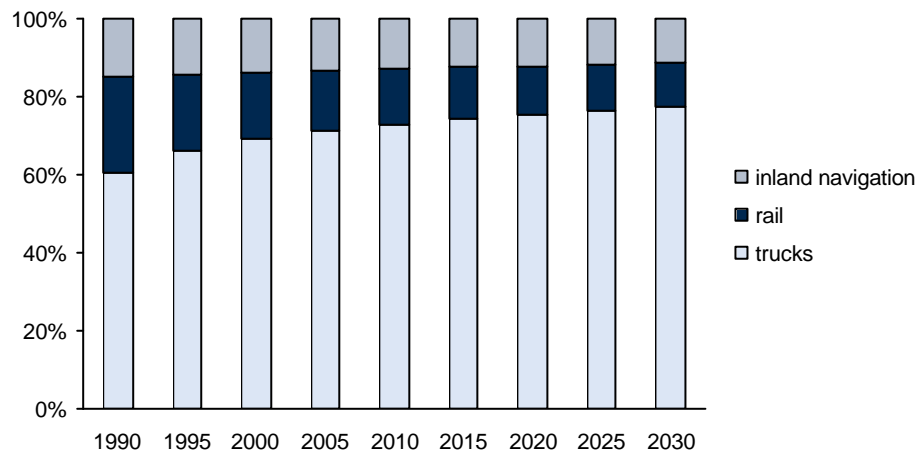
- Shifting road transport to other modes of transport (in particular rail, inland waterway and sea transport) whilst ensuring that the shipper experiences no loss of service or product qualities when using alternatives to road transport.
- Making road transport more efficient (higher load factors, less empty running).
- Avoiding road transport (by decreasing transport distances, diminishing the volume and weight of goods and savings on return flows) but still fully supporting commercial requirements.

Modal Shift was part of the Marco Polo I programme and it will be part of the Marco Polo II programme. Transport efficiency and transport avoidance are addressed in one of the new actions of the Marco Polo II programme: Traffic Avoidance Action.

Modal split

There is a growing imbalance between the modes of transport for freight transport in the European Union. The figure below shows that the share of road haulage is increasing from 60% in 1990 to 77% in 2030. The data source for this does not present data on sea transport or on pipelines. Statistics on the former EU (15 Member States) show that sea transport had a rather stable market share of about 40%.

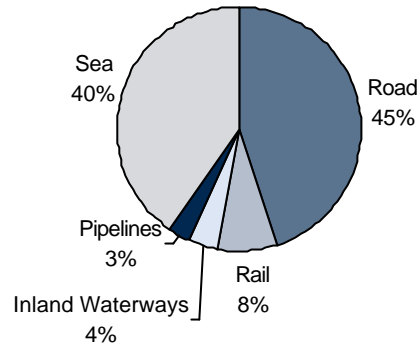
Figure 2.5 Modal split of freight transport in EU-25 (tonne-kilometres)



Source: PRIMES model, presented in: European Commission (DG for Energy and Transport), *European Energy and Transport Trends to 2030*

Note: Pipelines and sea transport are lacking in the PRIMES model

Figure 2.6 Modal split of freight transport in former EU-15 (tonne-kilometres)

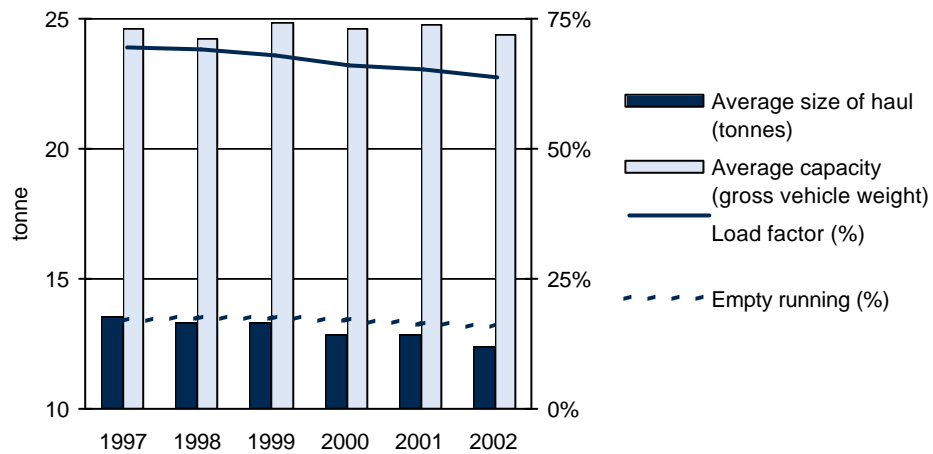


Source: European Commission (DG for Energy and Transport & Eurostat), *EU Energy and Transport in Figures. Statistical pocketbook 2003*

Transport efficiency

In general transport is considered efficient if both the loading capacity of the transport means is optimally utilised and the share of empty running is as small as possible. Regrettably, there are no European wide data available on the elements measuring the efficiency of road haulage transport and other modes. Therefore, the figure below presents some figures of Dutch haulage sector, which is a very internationally oriented industry with a rather high European market share in international road transport.

Figure 2.7 Transport efficiency of Dutch road haulage industry in international transport



Source: Dutch Central Bureau of Statistics

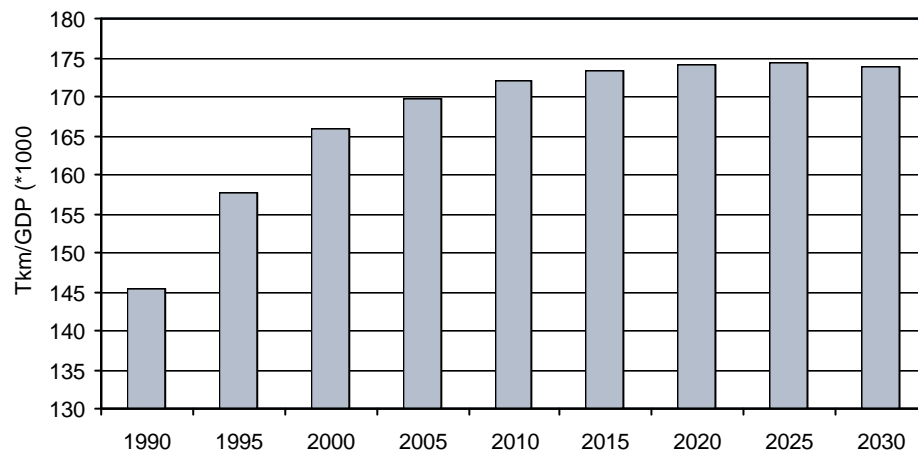
First impression is that the efficiency of Dutch road haulage industry shows a mixed picture. On the one hand the load factor declines between 1997 and 2002, whereas the average deployed loading capacity (gross vehicle weight) was rather constant. On the

other hand the share of empty running has dropped. Altogether, the average size of haul decreased from 13.6 tonnes in 1997 to 12.4 tonnes in 2002, which indicates that the efficiency of the Dutch road haulage industry in international transport has declined. This masks the changing volume/weight relationship of the commodities carried.

Transport redundancy

The increase in the ratio between tonne-kilometre of road transport and GDP as shown in the figure below implies a redundancy of (road) transport. Challenge for society is to decouple road freight transport activities from GDP.

Figure 2.8 Ratio between tonne-kilometre of road transport and GDP in EU-25



Source: European Commission (DG for Energy and Transport & Eurostat), *EU Energy and Transport in Figures. Statistical pocketbook 2003*

2.1.2 Factor analysis

The factors that have influenced the key problem are summarised under the two proposed means of combating the negative side-effects of road freight transport: Modal Shift and Traffic Avoidance.

Modal shift

Factors that possibly influence the imbalance of modes:

- Physical bottlenecks and missing links in the rail, inland waterway and port infrastructure.
- Limitations on service availability, capacity and accessibility (24/7 etc).
- Management weaknesses in the control and operation of infrastructure (congested roads and low use of rail and water options)
- Lack of terminals in ports and inland and lack of interoperability between modes and systems.
- Not all social and other system cost have been included in the price of road transport.
- Road haulage is perceived as being better adapted to the needs of a modern economy for some categories of cargo. The perceived lower quality and innovativeness of rail, inland waterway and sea transport services (in terms of time/speed, reliability,

damage, number of services etc.) is a problem to be overcome by re-positioning these modes commercially and in product and service terms.

- Lack of co-operation between transport providers of different modes.
- Insufficient knowledge of other modes of transport other than road haulage (by logistic s decision makers), including information technology issues.
- Slow service and product development time in rail and water based transport in response to market demands (e.g. JIT and Quick Response driven market sectors)

Traffic avoidance (through efficiency improvements & transport avoidance)

Factors that possibly mask some of the inefficiency in the road transport sector:

- Fierce price competition in road haulage
- Un-restricted access to the haulage industry (new enterprises and enterprises leaving the industry)
- Weight and size regulations (also local bans).
- No standardisation of vehicle sizes
- Certain logistical concepts, i.e. just-in-time and quick response that require more frequent but smaller journeys producing more vehicle miles to support JIT type activity
- Planning, tracking and tracing technology still developing
- Changes of the weight/volume ratio of goods
- Stabilisation of the empty running share

General factors that influenced the amount of (road) transport, apart from economic growth:

- Unfavourable value/weight ratio or value/volume ratio of goods.
- Increase of the handling factor in logistics, due to the interaction between production, warehouse and transport cost with falling transport cost component.
- Enlargement of distances (due to a number of reasons).
- More complex supply chains increasingly vulnerable to transport service disruption or failures.
- Complex JIT and Quick response driven logistics chains for high value time sensitive cargo have largely been beyond the competence of rail and waterborne transport.
- Desire for and policies to re-use and recycle commodities.

2.1.3 Actors analysis

Actors that (can) influence the modal split situation:

- Transport providers by offering a better quality/price-ratio for their integrated rail, inland waterway and sea transport services and new service packages equivalent to road transport.
- Logistics service providers (3PL, companies not only offering transport services).
- Shippers and receivers, due to their location decisions and purchasing decisions.
- Infrastructure administrators, both public and private.
- Public authorities because of their regulations, which may constrain potential multi-modal, service options (final mile type considerations).
- Public authorities, which may encourage alternatives to road freight transport through incentives to innovative multi-modal options.

Actors that (can) avoid or constrain road haulage traffic:

- Transport providers by efficiency measures (better loading their vehicles, route and drop planning and minimising empty running).
- Logistics service providers (by location decisions of their warehouses, due to transport planning, adapting logistical concepts); changes to or adaptations of supplier networks to minimise transport links.
- Shippers, due to their production location decisions and sourcing of supplies.
- Product and package designers through weight, volume and material considerations to minimise reverse logistics.
- Public authorities because of their regulations and control mechanisms.

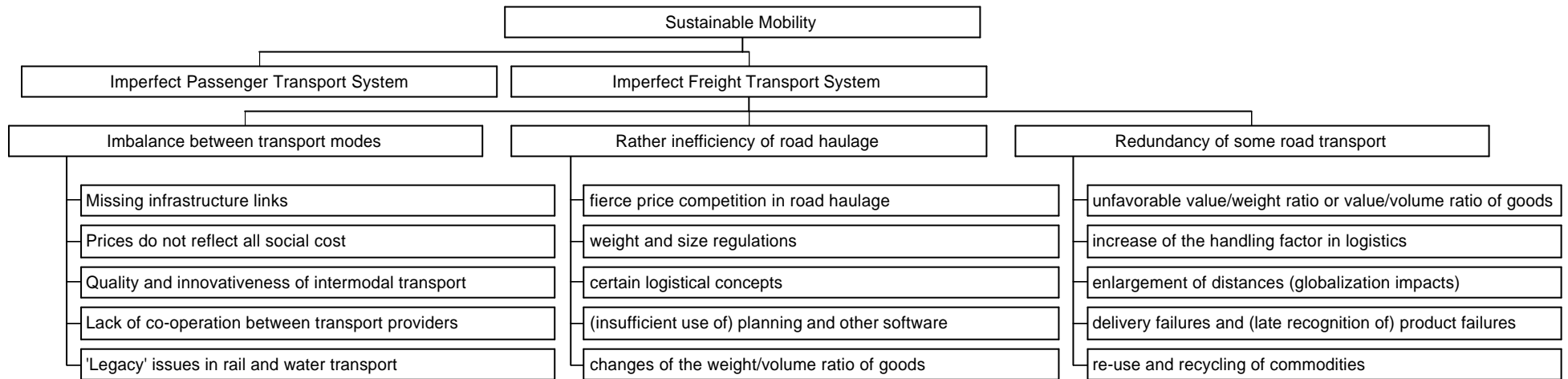
Actors that are influenced by the current road share situation:

- Transport providers, other logistics service providers, shippers, transport means providers and infrastructure providers.
- (other) road infrastructure users.
- All enterprises and organisations that are hindered by congestion.
- Neighbours of the road infrastructure because of the environmental and noise effects.
- Police and emergency services.

2.1.4 Cause-effect relations

The cause-effect relations between the factors influencing the key problem and the interest and motivations of the actors are visually presented in the problem tree(s) below. Since Marco Polo II is aiming for (i) modal shift, (ii) transport efficiency and (iii) transport avoidance a general problem tree (below) and three specific trees (in Annex 2) have been drawn.

Figure 2.8 General problem tree



2.2 Needs assessment

In order to establish a sound basis for setting measurable objectives and for choosing the most effective instruments in this section the needs and/or interests of target groups are identified and analysed. The following aspects are dealt with:

- Identification of target groups;
- Investigation of the situation, motivations and interest of the target groups;
- Needs of target groups versus objectives of the Community;
- Hierarchy of needs.

2.2.1 Target groups

For the Marco Polo II programme the following target groups are identified:

- Providers of intermodal and other transport services;
- Shippers/receivers and logistics service providers;
- Providers and managers of (intermodal) infrastructure;
- Public authorities (European/national/regional/city authorities and associated agencies).

Where necessary they are supported by other parties, for instance software providers.

The definition of the target groups is based on the **market approach**. A market can be seen as a place where supply and demand meet, where some parties have a product or service to offer to parties with a specific demand for such products or services. The same holds true for the markets on which the Marco Polo II programme will focus although the Marco Polo II programme is an intervention to induce movement towards longer-term policy (2020 Transport policy).

We have divided the market into three tiers:

1. Freight flow/shippers/receivers and logistics provision
2. The transport market (service providers)
3. The infrastructure market

Ad 1 Freight flow/logistics market

Increasingly the parties or companies involved are not the actual owners or producers of the products. More and more third (or even fourth) parties are dealing with the organization of transport links in complex supply chains. They are the parties that make decisions that can influence the split of transport across modes. They are the ultimate target group. They can make the decision to change from road to intermodal transport. They may be largely indifferent to the choices of mode selected for cargo movements and are primarily driven by commercial, profit driven imperatives.

Ad 2 Transport Market

On the transport market the cargo owners or their representatives form the demand side. They are usually identified as shippers and are the clients of logistics service providers/freight forwarders. Their cargo interests are moved by a combination of modal service providers between and within modes. For example some shipping lines own

trucking companies and effectively ‘own’ rail services as a consequence of their large market influence. Within modes relationships between companies may mask the actual assets in use, which may in turn be leased or sub-contracted. Some transport service providers also own and operate infrastructure as part of their portfolios (e.g. ship and terminal operations, train and terminal operations)

The providers of intermodal services form the supply side of the market. These parties or companies should be able to offer to their customers a service that meets the requirements (needs) of the shipper of logistic service provider at a level equivalent to the road transport-only option in terms of:

- Reliability;
- Cost;
- Availability;
- Security throughout the supply chain;
- Management credibility and competence.

Ad 3 Infrastructure Market

In order to facilitate potential providers of intermodal services to develop and sell services in a way that aligns with the specified requirements, it is vital that the appropriate infrastructure is there to be used. The past has shown that intermodal transport is only a viable option if the infrastructure (in order to facilitate the intermodality) is available, accessible and run efficiently. Too often the higher costs of intermodality prohibits a further widespread development of intermodal transport. Hence we identified the market for infrastructure as a separate market.

The providers of the intermodal services form the demand side on this market, whilst the providers of the infrastructure form the supply side.

2.2.2 Hierarchy of target groups’ interests

In order to assess the needs of the three target groups and their respective organizations a distinction between the public and private parties should be made. In general the shippers/logistic service providers as well as the providers of intermodal services are private, whilst the providers of infrastructure were predominantly public. This position is changing at different rates within the EU. Road infrastructure is normally ‘owned’ and managed by national and local authorities. Rail infrastructure is predominantly held in the public domain also although there are other models of operation (e.g. non-profit making trusts and smaller scale private lines or networks). Terminal infrastructure is also an evolving mix of public and privately owned models.

General analysis: public and private needs

In general it could be stated that any private party has one dominant goal and that is profit maximisation. All of the needs and interests that they show will in the end have the goal to maximise profit (same holds true for goals like “continuity”). Again in general there are two strategies to reach this goal:

1. Revenue optimisation: get the maximum value out of the clients on the market.
2. Cost minimisation: organize the activities in a way that minimizes the costs needed to satisfy the customer.

These two orthodox economic strategies could come into conflict. In order to optimise the revenues, a certain quality of the product or service concerned is required. This will require some additional costs, not wanted if the cost minimisation strategy is adopted. In the end it is all about a balance between quality (costs) and prices and available alternatives.

These private parties have needs that are not in conflict with the public interest (the interest of the public parties) although their respective priorities may be different. Some of the general objectives that are served by public parties are prosperity, legal framework, income, equity, job protection and creation, safety, environment, social cohesion and stability.

Needs of the target groups

The above also holds true in a transport-market in general and in the market for intermodal services and infrastructure in particular. The following hierarchy of needs can be identified:

Shippers and logistics service providers' hierarchy of needs:

1. Reliability and precision of the available services;
2. Price of the services;
3. Flexibility of the services;
4. Time involved/speed of services compared to alternatives;
5. Knowledge of the availability and accessibility of the services (24/7, 365);
6. Safety concerning the product throughout the transit;
7. Competence of the service provider.

Intermodal service providers' hierarchy of needs:

1. Sufficient well managed capacity of line-infrastructure for waterways and rail.
2. Sufficient capacity and capability for changing modes and operating within modes efficiently and effectively.
3. Competitive prices for terminal handling operations.

Infrastructure providers' hierarchy of needs:

1. Achieving a better balance between transport modes;
2. Optimal use of capacity and capability of (line) infrastructure;
3. Optimal use of capacity and capability of terminals;
4. Safety and security of the transport system;
5. Environmentally compliant.

2.2.3 Target groups' needs versus Community objectives

The perspective of the target groups above may incorporate a limited international dimension but this may not align with generic concerns and policy issues at a wider EU level.

With respect to the Marco Polo II programme, which aims specifically at shifting freight off the roads, the needs hierarchies of the target groups, as identified above, support the Community general objectives. All parties are likely to be looking for a higher share of intermodal transport systems, and all parties will benefit from this development as long as the services are equivalent to or better than the road based option.

The largely commercially specified needs of the shippers and logistics service providers (parties with cargo interest) may operate within the EU's general objectives on sustainability with limited direct intervention or involvement. They support the more specific objective of Marco Polo II (reducing international road freight traffic growth) and drive the operational objectives and related actions.

The needs of the intermodal service provider impact on public and private entities largely at national and local levels. The EU's specific objective is met at a generic level in relation to capacity and capability to serve the needs of users and is linked to modal shift operational objectives. Pricing issues are essentially commercially driven market positions.

The EU is focused on achieving an inter-modal shift and the hierarchy of needs of the infrastructure providers aligns directly with this operational objective.

Long run

An improved intermodal transport system and the avoidance of redundant freight transport aim in the long run to improve the operations of the end-client: the shipper or logistics service provider. The shipper will demand more reliable control over his transport activities, and that will help him to fulfil the needs for clients and users. Sustained reliability is the key-issue there.

The needs of the intermodal service providers and infrastructure providers are also in line. There will need to be a robust and transparent selection of credible investments that are capable of supporting the Marco Polo II objectives and for projects that will be intensively and extensively utilized to justify the Marco Polo II intervention.

2.3 SWOT analysis

The following SWOT analysis is focused on the situation addressed by intervention in the form of the Marco Polo II programme aimed specifically at Reducing International Road Freight Transport Growth.

Strengths

- Addresses a key policy issue already identified in EU 2020 transport proposals across the EU-25 spectrum;
- Acts as a short-medium term intervention using existing technologies and acts as a support to some projects that may not be commercially acceptable or for projects that require a longer development process to achieve commercial acceptance;
- Addressing the rail problems by combining freight and passenger through Rail Synergy Action;
- Aims at reducing congestion, traffic accident reduction and environmental enhancements as a composite action with reduced infrastructure damage / decreasing maintenance cost;
- Makes more efficient use of existing inter-modal/multi-modal infrastructure;
- With granting sound business plans up to 35% (total public aid) Marco Polo II capitalizes on the opportunities of public-private partnerships adequately.

Weaknesses

- Programme size, profile, short-term focus and duration may be insufficient to make desired impact on balancing modal shift away from road;
- Short-term actions may restrict innovative projects or concepts that have a longer gestation period (but < DG Research threshold);
- Equity of project judgment between EU-15 & EU-25 judgement of bulk and general cargo projects;
- Focus on tonne-kilometre output measures only;
- Risk assessment differentiation;
- Multi modal capabilities in terms of time and service may not be equivalent to road transport and user requirements/expectations;
- High implied (infrastructure) investment to support inter-modal options using existing rail and water technologies;
- Transport costs are no serious driver for traffic avoidance (therefore Marco Polo II grant is only seen as a 'bonus').

Opportunities

- Reduction of mono-modal dependency and mono-fuel dependency for transport services and to secure strategic shift of transport service supply options;
- To support EU integration, competitiveness, regional and local economic stimulation by enhanced transport service options and capabilities;
- Value for money considerations from exploitation of existing infrastructure capacity and capability;
- Support for innovative service packages not initially supported wholly by market considerations;
- Inter-modal transport efficiency gains through exploitation of inherent capabilities and capacities of rail and water transport;
- To secure product and service development initiatives in real market conditions to verify credibility and acceptance.

Threats

- Inadequacy of funding, low profile, low and skewed take up to achieve objectives;
- Low impact in market and market share rebalancing;

- Resistance to change from rail and water sectors and failure to maximise Marco Polo II opportunities;
- Skill base to implement the projects (unavailability of skilled labour);
- Road traffic growth continues for key traffic sectors with minimal inter-modal involvement;
- Quality and number of projects is inadequate;
- National railway policies resist reform;
- Less flexible logistics and economy;
- Unfair competition between Member States.

2.4 Conclusions

The planned Marco Polo II programme is aimed at a clearly identified problem. It supports the general objective of sustaining mobility with reduced congestion, reduced environmental impact and enhanced safety. The specific objective of containing the growth of international road freight is to be achieved by supporting credible projects aimed at modal shift and traffic avoidance,

The proposed reduction in road traffic tonne/ km within the planned Marco Polo II appears as a credible means of containing the negative aspects of road freight activity potentially using a range of robust, practical, visible measures designed to achieve direct and positive impacts. These could include a range of efficiency measures, traffic avoidance initiatives and the use of alternative practical inter-modal options. More new and innovative measures may also be required and Marco Polo II could stimulate such developments. Marco Polo II has the added advantage of directly addressing organizations and entities with identified problems and seeking means to a secure more efficient and effective alternatives.

It is conceivable that the operational objectives of Marco Polo II and some of the action measures could be partially met by the use of an alternative focus such as passenger vehicle transport use and growth constraint. There remain concerns over some structural and organizational issues within the alternative transport modes and their capability to respond positively to the opportunities the Marco Polo II programme is designed to realise.

3 Objectives and indicators

3.1 Objectives and actions of Marco Polo II

Setting concrete measurable objectives is fundamental to the success of the Marco Polo II programme, because it:

- Clarifies the link between the Marco Polo II programme and DG TREN wide strategies.
- Provides a common understanding why the Marco Polo II programme is important.
- Underpins the definition of the criteria for success of the Marco Polo II programme and defines the indicators with the help of which progress will be measured.
- Lays the base for later evaluations.

There are different levels of objectives to distinguish.

General objective

The general objective of the Marco Polo II programme is: *to reduce road congestion, enhance traffic safety and to improve the environmental performance of the freight transport system within the Community, thereby contributing to an efficient and sustainable transport system.*

Specific objective

The specific objective of the Marco Polo II programme is: *to get at least the expected increase of international freight transport off the road.*

Operational objectives

Two main ways of delivering the specific objective of the Marco Polo II programme have been identified: *modal shift and traffic avoidance.*

Actions

In the Marco Polo II programme six actions have been formulated to achieve its operational objectives. Modal Shift Actions ('just shifting freight off the road'), Catalyst Actions and Common Learning Actions were part of Marco Polo I. In the Marco Polo II programme Motorways of the Sea, Rail Synergy and Traffic Avoidance have been introduced as new actions. At the same time, the Catalyst Actions have been upgraded by allowing infrastructure funding to be part of this action. In Table 3.1 the six actions are presented with typical examples.

Table 3.1 Actions in the Marco Polo II Programme

	Action	Examples / Features
1	Modal Shift Action (just shift freight off road; robust, not innovative)	Setting up a new service or link Increasing efficiency at terminals and borders IT (tracking and tracing) and vehicle technology New terminals and transshipment equipment Ancillary infrastructure Financial assistance limited to 35% of total expenditure Viable after 36 months of Community funding commencement
2	Motorways of the Sea (innovative on a European level)	High frequency and high quality intermodal services Flexible and efficient port services Good access to ports and efficient hinterland connections Simplified procedures and inspections Short sea shipping, rail and inland waterways, whereas road journeys as short as possible Intermodal infrastructure completed within 18 months, cumulative subsidy limited to 50% of infrastructure expenditure Dissemination of results and methods Financial assistance limited to 35% of total expenditure Viable after 48 months of Community funding commencement
3	Rail Synergy (innovative on a European level)	Combined freight-passenger use of platforms and stations Higher utilisation of existing transport infrastructure Road journeys remain as short as possible in "door-to-door" services Infrastructure completed within 18 months, cumulative subsidy limited to 50% of infrastructure expenditure Dissemination of results and methods Financial assistance limited to 35% of total expenditure Viable after 48 months of Community funding commencement
4	Catalyst Action (overcome structural market barriers, highly innovative)	High speed and non-stop intermodal services High quality and well integrated intermodal services Tri-modal compatible and other innovative loading units Reliable transport and logistics information systems Infrastructure completed within 18 months, cumulative subsidy limited to 50% of infrastructure expenditure Financial assistance limited to 35% of total expenditure Viable after 48 months of Community funding commencement
5a	Transport Efficiency (a)	Services that increase load factors Services with less empty running Vehicle technologies with improved and enlarged cargo deck Financial assistance limited to 35% of total expenditure Viable after 48 months of Community funding commencement

	Action	Examples / Features
5b	Transport Avoidance (a)	<ul style="list-style-type: none"> Relocation of production or distribution sites Less links in the logistical chain Product design and product modifications (including packaging) in order to diminish volume and/or weight of goods Extract water or air from the goods Digitalise the goods Diminishing empty packaging Reduction of waste flows Infrastructure and fixed assets completed within 24 months, cumulative State Aid limited to 35%, except for infrastructure expenditure, which is limited to 50% Community financial assistance limited to 35% of total expenditure Viable after 48 months of Community funding commencement
6	Common Learning Action	<ul style="list-style-type: none"> Improve co-operation and sharing of know-how of Modal Split and Traffic Avoidance Feasibility studies and improving stakeholders' understanding Improving and adapting procedures and methods Training Financial assistance lasts for a maximum of 24 months Community financial assistance limited to 50% of total expenditure

(a) In the draft regulation presented as one action: Traffic Avoidance.

In PACT and Marco Polo I the modal split actions were aiming for just shifting freight off the road. The action was therein successful. Its projects were robust and rather innovative.

The second type of instrument of the Marco Polo I programme is the Catalyst Actions. These actions address important barriers for intermodal transport. One of these barriers is the lack of high frequency, high quality intermodal services. One of the newly foreseen actions in the Marco Polo II programme is the Motorways of the Sea, particularly aiming at removing this barrier. The Motorways of the Sea action might be a useful addition to the modal shift instrument, particularly because this action includes substantial investment in infrastructure. Therefore it makes sense to create a 'status aparte' for the Motorways of the Sea.

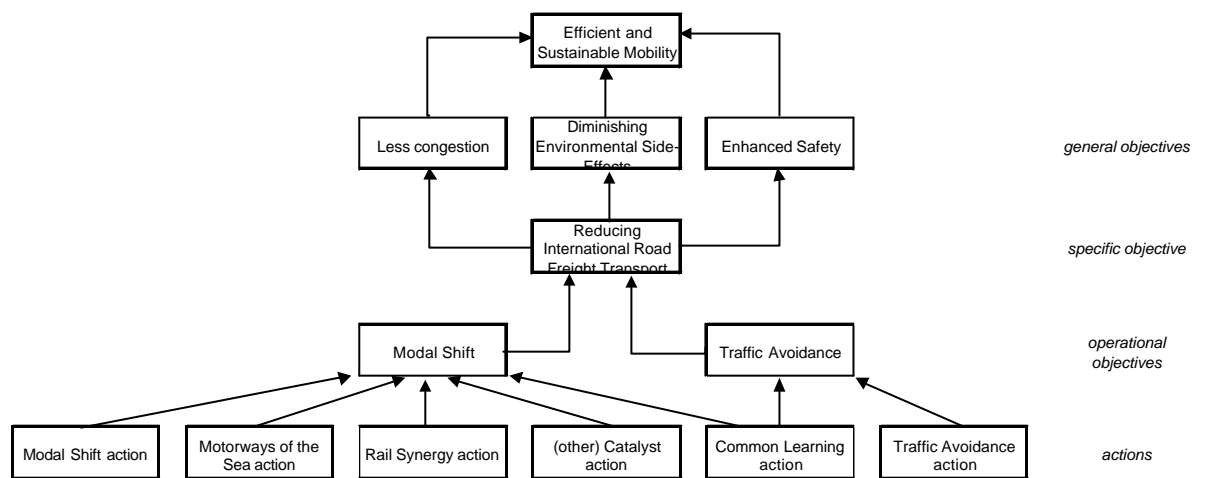
The draft Marco Polo II programme also underlines another Catalyst Action: Rail Synergy. Although part of these kind of projects (e.g. integrated freight-passenger transport services) have not been very successful in the previous PACT and Marco Polo I call nor in national projects, the potential impact of these projects is high, namely when funding of (reviving) mixed infrastructure for both freight and passenger transport is involved. It might result in a focus for "land-based" general cargo (including parcels) for the Rail Synergy action, whereas the Motorways of the Sea focuses on the 'maritime' transport of containers between major ports and the hinterland.

Granting traffic avoidance may have a high potential impact on the specific road share objective of the Commission it seems potentially a very useful addition to the

programme. This action can be divided in transport efficiency (by increasing load factors and decreasing empty running) and transport avoidance (by decreasing transport distances and by diminishing the volume or weight of goods and packaging to improve cargo payloads).

The Marco Polo I programme also included a Common Learning Action on modal shift. Within the Marco Polo II programme it has been expanded to an action for improving co-operation and sharing of know-how with respect to both modal shift and traffic avoidance. Figure 3.1 presents an overview of objectives and type of actions of Marco Polo II.

Figure 3.1 Objectives and type of actions of Marco Polo II



3.2 Indicators and target levels

The purpose of this section is to translate the objectives into more tangible quantified or otherwise measurable outcomes, and to define on what basis achievement will be measured. For this reason, indicators are developed in order to help monitor progress and to report on the objectives.

Requirements of the indicators:

- Clear link between indicators and objectives (the indicators are *relevant*).
- Data collection involves low cost (the indicators are *easy* to monitor).
- Information from the indicators is unambiguous and easy interpreted (the indicators are *credible* for those reported to).
- Indicators are discussed with the staff of the department (the indicators are *accepted*).
- Indicators are resistant against manipulation by those responsible (the indicators are *robust*).
- Benefit for monitoring and credibility of reporting outweigh cost of data gathering (the indicators are *cost efficient*).

General objective

The outcome or impact indicators for sustainable mobility (general objective of the Marco Polo II programme) are respectively: road congestion, traffic safety and environmental performance of the freight transport system.

Specific objective

The result indicator for the specific objective of the Marco Polo II programme is defined in terms of **tonne-kilometres** shifted off the road (or avoided). However, a target level measured in tonne-kilometres is weighted in favour of bulk cargo rather than containerised or general cargo projects. Another remark is that part of the Marco Polo II programme concerns transport efficiency. More efficient transport can lead to a decrease of vehicle kilometres without affecting tonne-kilometres (if just the percentage of empty running is declining). For that, (decrease of) road haulage kilometres or vehicle kilometres might be an alternative. Practically, in almost all European countries only tonne-kilometres data and forecasts are available rather than alternative indicators.

The target level for the result indicator is to get off the road at least the expected increase of international freight transport within the European Community between 2007 and 2013.

Estimations of freight transport growth have been derived from the PRIMES model that has been presented by the European Commission in the *European Energy and Transport Trends to 2030* report. The PRIMES model distinguishes 3 modes for freight transport (road, rail and inland waterways) and is one of the very few models with a wide geographical coverage (30 European countries) for freight transport forecasts.³

A split into domestic and international freight transport is missing in the PRIMES model. Therefore share of international road freight transport has been assessed by ECORYS using road freight data from Eurostat (period 1990-2001) for most current Member States and some candidate countries. This share of international road freight transport is assessed at approximately 40% (and expected to show a slight increase). In addition, forecasts for some years have been deduced by interpolation.

The tables below show transport performance measured in tonne-kilometres for, respectively, the present EU and EU-25+ for the various years between 2007 and 2013.

Table 3.1 Forecast and target level of international road transport in EU-25 (in tonne-kilometre * billion)

	2006	2007	2008	2009	2010	2011	2012	2013
Road transport	1.762	1.813	1.864	1.915	1.966	2.019	2.073	2.126
International road transport	696	717	737	757	777	798	819	840
Off the road target		20,2	20,2	20,2	20,2	21,0	21,0	21,0

³ Other European wide, multi-modal freight transport models include SCENES and NEAC only.

Table 3.2 Forecast and target level of international road transport in EU-25+ (in tonne-kilometre * billion)

	2006	2007	2008	2009	2010	2011	2012	2013
Road transport	2.017	2.082	2.146	2.211	2.275	2.344	2.413	2.482
International road transport	797	823	848	874	899	927	954	981
Off the road target		25,5	25,5	25,5	25,5	27,3	27,3	27,3

EU-25+ reflects current Member States, Bulgaria, Romania, Norway, Iceland and Liechtenstein

In the period 2007-2013 performance of international road freight transport for the **EU-25** is expected to increase by 144 billion tonne-kilometres, or an average yearly increase of approximately **20.5** billion tonne-kilometres. For **EU-25+** the expected increase is estimated at 184 billion tonne-kilometres, which is on average a **26** billion tonne-kilometres per year increase.

Operational objectives

The output indicator for the operational objective is the modal shift and other avoided road transport (practically measured in **tonne-kilometres**) on account of the Marco Polo II funds. The target level for the operational objective is that for every €1 financial assistance the reduction of international road freight transport is at least **500** tonne-kilometre.

In addition, the operational objective could also be formulated in terms of external cost avoided by every €1 financial assistance. PACT and Marco Polo I have avoided about € 12-14 external cost for every granted €1. However, this kind of calculation is very vulnerable to the assumptions made on this.

Actions

Under direct control of those managing the actions of the Marco Polo II programme is the number projects granted. In order to guarantee the 500 tonne-kilometre shift for €1 funding ratio the management of the Marco Polo II programme will only select projects that reach this threshold according to the submitted (and sound) business plan. Therefore the (qualitative) target level is that the success rate (number of projects exceeding the threshold divided by the total number of funded projects) of each of the actions is as high as possible.⁴

Any funded project must pay off shortly. Hence, Common Learning Actions ought to lead to an improvement of commercial services in the market within 24 months, Modal Shift Actions must be viable on their own after 36 months at most, whereas any other action will achieve its objectives within a period of a maximum of 48 months. If infrastructure works are included in the action, they need to be completed within 18 months from the starting date of the action (for Traffic Avoidance actions this period may be up to 24 months). The maximum duration of the projects may be normally extended by the time required to complete the infrastructure works, but in any case not longer than a total period of 62 months (60 months for project completion and two months to produce the Final report).

⁴ In chapter 6 of this ex-ante evaluation of the Marco Polo II programme we will make some assumptions on the success rate for the calculation of the required budget.

3.3 Conclusions

The Marco Polo II programme is capable of supporting the general and specific objectives set out to reinforce the overall objective of efficient and sustainable mobility. This will be achieved through a series of operational objectives and action initiatives. These will potentially be able to be tracked and measured using one central key performance indicator to verify their effectiveness.

A target performance indicator for achievement of the operational objective has been set (1 € reduces road transport by 500 tonne -km) and this is a threshold for all applicant projects to realise. The central target could be reset if required but appears to be practical and achievable. The potential inclusion of infrastructure into the Marco Polo II projects is likely to increase the threshold cost level for individual project submissions. The direct consequence is that any such project must also be able to achieve the same core target tonne -km return.

There are concerns that the use of only one central indicator may be too coarse and that the programme may be vulnerable to criticism and weakness because of the given nature of the target level for the operational objective.

4 Alternative delivery mechanism and risk assessment

4.1 Introduction

The aim of Marco Polo II is to reduce the international freight transport growth with financial assistance as *intervention strategy*. Its *instruments* concern grants mainly for services and infrastructure that can be realised in the short-term. The *levels* of the grants correspond up to 35% for both services and infrastructure. Direct support to the beneficiaries is the *channel of intervention* in Marco Polo II.

In most cases there are alternative ways for achieving a specified objective. This is also valid for the general and specific objectives of the Marco Polo II programme. This part of the ex ante evaluation focuses on the *identification and assessment of different policy tools*.

A key requirement to identify firstly is, whether the Marco Polo II programme is necessary or whether a zero-based level of involvement is sufficient and hence allowing market forces to prevail. Or alternatively, should there be a programme like Marco Polo II encouraging intermodal passenger transport services and including passenger car movement reduction measures?

An intermodal passenger programme could encourage (public) transport companies, employers, tourism organisations to start and use international intermodal passenger services for (mainly) business trips and short leisure and longer holiday trips. This by means of, among others:

- start-up of new liner services by train, bus or waterway;
- reviving obsolete rail tracks and crumbling stations;
- making alternative transport modes (like airships) commercially viable;
- public transport “on-demand” services;
- integrated passenger services, like car-ferries and auto trains;
- modal shift in tourist transport, including low cost carrier concepts

Table 4.1 Deliberating the necessity of Marco Polo II

Alternative	Effectiveness (a)				Costs (b)	Risks (c)
	Congestion	Environment	Safety	Specific Objective (Tonne-km)		
Marco Polo II	2	4	3	4	2	L
No Marco Polo II	1	1	1	1	1	L
Intermodal passenger programme	3	4	4	1	4	M

(a) 1 to 5 scale for effectiveness: 1 = not effective, 2 = slightly effective, 3 = modestly effective, 4 = very effective, 5 = extremely effective

(b) 1 to 5 scale for cost: 1 = very low cost, 2 = low cost, 3 = average cost, 4 = high cost, 5 = very high cost

(c) risk assessment: L = low, M = medium, H = high

Cost and risks are by definition low by ‘no Marco Polo II programme’, however, reaching general objectives is very uncertain with such a “laissez-faire” policy. A Marco Polo II programme for passenger transport might be more effective than a freight transport programme, since passenger transport has the biggest share in total traffic. However,

- To direct a Marco Polo programme to travellers, passengers and commuters would be far more expensive and contentious.
- The negative side effects of freight transport are normally higher per vehicle-kilometre, therefore one may expect a higher cost effectiveness ratio.
- Therefore the risk of not reaching its objectives is considerably lower for a freight rather than a passenger transport Marco Polo programme.

4.2 Alternative options

A Marco Polo programme for freight transport might be cost-effective in reaching its specific and wider objectives, the question is still whether it makes use of an appropriate *intervention strategy* with sensible *instruments* on the right *level* via the most convenient *channels of intervention*.

4.2.1 Intervention Strategy

Marco Polo II is being developed as a new and expanded programme of *financial assistance of logistic services* to reduce road freight transport in order to deliver the wider objectives of reduced road traffic congestion, improved environmental performance and enhanced safety of the transport system. Alternative intervention strategies to achieve the specific objective are:

- A price or tax policy as an alternative intervention strategy including externalities on road transport, fuel and other fiscal incentives for rail and water borne intermodal services.

- Regulations including more radical and intensive rail liberalization and reduced customs/border delay, more robust and comprehensive weight, speed and access limits, licence quotas for road transport.
- An infrastructure programme with investment, management and control measures such as traffic information systems.
- A promotion strategy based on (good practices in) intermodal transport, transport efficiency and transport avoidance and the voluntary uptake of these.

Pricing policy might be a policy tool to reduce road transport and its perceived negative side effects. The policy mentioned here should discourage the use of road transport (congestion charging, toll charge per kilometre). Related to a price policy is taxation, which could accomplish the same or reinforce the move away from road transport. Also incentive and tax concessions to move traffic from peak hour conflict into less active time bands belong to this alternative. Employment issues such as the availability of staff in warehouses to receive or dispatch traffic away from orthodox time bands could also be incentivised.

In terms of *regulations/directives*, a lot of examples exist that all focus on encouraging modal shift. Possible examples include the setting of a maximum on the number of trucks on specific corridors through vehicle route licences and more rigorous control of entry into the road freight service provider sector through the inclusion of financial and skill competence entrance requirements. Other examples could include: truck driver license restrictions and improved priority for rail freight in railway operational planning to maximise the impact of open access and other freedoms.

Infrastructure measures include e.g. road capacity and management investments in order to combat road congestion. Other measures could include: Lane Warning Driver Assistance (LDWA) systems, appoint dedicated road freight lanes on selected corridors, improve the flow of traffic by adjusting speed limits to the amount of traffic and using quiet asphalt or other innovative materials to diminish noise effects. Accurate (real-time) traffic information also contributes to combating road congestion. Whenever heavy congestion occurs on a corridor, alternative routes should be identified and made available to road users, including passenger and freight.

Promotion of good practices in intermodal transport, transport efficiency and transport avoidance is the last alternative strategy presented here. Also presenting and emphasizing the external effects of road transport are part of this alternative.

Table 4.2 Strategic alternatives for Marco Polo II

Alternative	Effectiveness (a)				Costs (b)	Risks (c)
	Congestion	Environment	Safety	Specific Objective (Tonne-km)		
Marco Polo II	2	4	3	4	2	L
Price/tax policy	2	3	3	3	2	M
Regulation	3	4	3	3	3	L
Infrastructure package	4	2	3	2	5	H
Promotion strategy	1	2	3	3	2	L

- (a) 1 to 5 scale for effectiveness: 1 = not effective, 2 = slightly effective, 3 = modestly effective, 4 = very effective, 5 = extremely effective
- (b) 1 to 5 scale for cost: 1 = very low cost, 2 = low cost, 3 = average cost, 4 = high cost, 5 = very high cost
- (c) risk assessment: L = low, M = medium, H = high

Regulation and an infrastructure package might be as effective as Marco Polo II. However, costs of implementing these alternative strategies are respectively higher and far higher for the Commission. Furthermore, the risks of not reaching the objectives are considered higher for the infrastructure package than for Marco Polo II. Strict regulation might have negative impacts on the competitiveness of Europe (see European Added Value, Section 5).

A price/tax policy as described before will have approximately equal cost but is less effective and more risky than Marco Polo II. Promotion as an intervention strategy has a similar low cost and risk profile as Marco Polo II, but is certainly less effective.

4.2.2 Instruments

Marco Polo II is essentially a risk-reducing programme. On the instruments level, alternatives for the proposed financial instrument to reduce international road freight transport growth should be defined. Alternative financial options to reach this specific objective are:

- Interest-free loans or soft loans (duration and interest rate).
- Success fee (afterwards).

The use of *loans* rather than a grant-based mechanism could stimulate more commercially robust and focused projects capable of implementation. The loans could be interest free, subsidised or be of extended duration. However, such an instrument possibly prevents submission of effective, high risk projects.

A *success fee* disbursed after the project has showed its effectiveness is another alternative for the grants within the Marco Polo II programme. However, like a loan a success fee afterwards possibly prevents submission of potentially effective, high risk

projects, which is not in line with the risk reducing nature of the Marco Polo II programme.

Table 4.3 Alternative Marco Polo II instruments

Alternative	Effectiveness (a)				Costs (b)	Risks (c)
	Congestion	Environment	Safety	Specific Objective (Tonne-km)		
Marco Polo II	2	4	3	4	2	L
Subsidized Loan	2	2	2	2	2	L
Success fee	2	2	2	2	3	M

- (a) 1 to 5 scale for effectiveness: 1 = not effective, 2 = slightly effective, 3 = modestly effective, 4 = very effective, 5 = extremely effective
- (b) 1 to 5 scale for cost: 1 = very low cost, 2 = low cost, 3 = average cost, 4 = high cost, 5 = very high cost
- (c) risk assessment: L = low, M = medium, H = high

With subsidized loans or success fees as a preferred instrument to Marco Polo II, these will be less effective entirely, because effective but high risk projects will neither be submitted nor funded. In addition, costs of paying out rather high success fees for projects that together with Commission aid would already be fully viable, is higher than for Marco Polo II.

4.2.3 Channels of Intervention

The Channels of Intervention relate to the means of support to beneficiaries. In the proposed Marco Polo II programme there is no restriction towards applicants for funding; basically any commercial legal entity involved in international freight transport could apply.

Other mechanisms towards direct assistance to main beneficiaries are assessed. The position of multiple entry by project/service developers and the role of international bodies already engaged in this generic area, may need to be re-assessed to ensure equity and good value for money is achieved.

Alternative channels of intervention for defined direct support to beneficiaries are:

- Funding through Member States national programmes, regional, state or city based measures with PPP type options.
- Funding through stakeholder associations or other intermediate actors.

Table 4.4 Alternative channels of intervention

Alternative	Effectiveness (a)				Costs (b)	Risks (c)
	Congestion	Environment	Safety	Specific Objective (Tonne-km)		
Marco Polo II	2	4	3	4	2	L
Member State funding	3	3	3	3	2	M
Stakeholder org. support	2	2	3	2	3	M

- (a) 1 to 5 scale for effectiveness: 1 = not effective, 2 = slightly effective, 3 = modestly effective, 4 = very effective, 5 = extremely effective
- (b) 1 to 5 scale for cost: 1 = very low cost, 2 = low cost, 3 = average cost, 4 = high cost, 5 = very high cost
- (c) risk assessment: L = low, M = medium, H = high

Effectiveness of indirect intervention via national, regional and local public funding is not higher than direct support to beneficiaries from the Marco Polo II programme, unless this also allows support for national freight transport (particularly for combating congestion). However, the (bureaucratic) costs of indirect funding of international freight transport might be higher, which makes indirect funding less cost-effective and relatively more risky. In addition, as a result of increased transaction costs, effectiveness of funding via stakeholders' associations is normally lower than supporting the beneficiaries directly.

4.2.4 Alternative levels

Regarding the levels of Intervention, two streams of alternatives are likely, namely variable *grant levels* and variations in the definition of the *target group*.

Alternative options for defined rate of assistance and target group:

- Maximum grant of 50% (or higher with longer project durations).
- Maximum grant of 100%.
- Restricted target group of either shippers or logistics service providers as cargo interests or intermodal and other transport service providers or just infrastructure providers.

Extension of Marco Polo II to include domestic traffic impacts could be an alternative as well. However, a considerable number of Member States has a national modal shift programme and some have transport efficiency promoting measures (see Section 5).

Table 4.5 Alternative grant and target group levels

Alternative	Effectiveness (a)				Costs (b)	Risks (c)
	Congestion	Environment	Safety	Specific Objective (Tonne-km)		
Marco Polo II	2	4	3	4	2	L
Max grant 50%	2	4	3	3	3	M
Max grant 100%	3	4	4	4	5	H
Restricted target group	2	2	3	2	2	M

- (a) 1 to 5 scale for effectiveness: 1 = not effective, 2 = slightly effective, 3 = modestly effective, 4 = very effective, 5 = extremely effective
- (b) 1 to 5 scale for cost: 1 = very low cost, 2 = low cost, 3 = average cost, 4 = high cost, 5 = very high cost
- (c) risk assessment: L = low, M = medium, H = high

Only granting a smaller target group of just companies with a direct cargo interest or intermodal transport providers or infrastructure providers, is definitively less effective than granting all beneficiaries. Furthermore a higher maximum grant is definitely more expensive and potentially more risky for the Commission than a 35% grant, whereas added value is marginal. In Section 10 the cost effectiveness of infrastructure funding is touched upon.

4.3 Risk assessment

4.3.1 Identification of risks

Risks at a generic level should include, as a minimum, consideration of the following in relation to Marco Polo II projects and their ability to deliver positively against the strategic objectives set:

- *Technical risk*: This should include an assessment of the technology or mix of technologies planned for use in any project and the likelihood of the project failing wholly or in part as a consequence of technical issues. Within the Marco Polo II programme the technical risk should be minimal as the main focus is on the short-term deployment of new services and measures based on already available and proven technologies even if these are deployed in new combinations or applications.
- *Commercial risk*: This should include an assessment of all the key commercial elements in any Marco Polo II project proposal including the financial well being of the project sponsors/supporters and the integrity of the case presented for Marco Polo II support. This area is likely to be the most risky within the context of any Marco Polo II project proposals and will require thorough and comprehensive tools for review and selection of projects for support. The business plans accompanying any Marco Polo II project proposal will need to be subjected to close scrutiny in relation to the underlying assumptions of the plan and mitigation measures proposed.
- *Management risk*: This should include an assessment of the competence and capability of the project sponsors in relation to their ability to develop and deliver the

project proposed to the Marco Polo II programme, previous experience and expertise in related fields and the use of any sub-contracted resources. Within the context of Marco Polo II the competence and capabilities of the management team with assigned responsibility for the delivery of the project (as described in a business plan) must be an explicit component of any proposal. This should then allow a judgement to be made by assessors on the competence of any proposed management team and the methods intended to deliver the project. The replacement of key management personnel during an active project is an issue that will need to be carefully monitored to ensure continuity and delivery of the project

- *Political risk*: This should include an assessment of the political acceptance of the Marco Polo II measure or project in relation to EU policy and national policy proposals to avoid the risk of projects clashing or running counter to declared policy targets. For Marco Polo II project proposals these will need to demonstrate alignment with declared EU and national policies and this position should be clearly stated. In the event of major changes of political orientation within a country with an active Marco Polo II project the implications of such changes will need to be absorbed and decisions made on the respective merits of continuing the project in the new framework or terminating the project. Decisions in this area will need to be reviewed and agreed by DG TREN in consultation with the project management.
- *Country risk*: This should assess the relative risk of investing in countries and to measure the level to which monies will be spent effectively, efficiently and without risk of loss or fraud. Existing available measures of individual country risk could be used. The Marco Polo II programme will have to establish a ranking of the measure of exposure it is prepared to accept on a country by country basis to achieve the strategic objectives of the programme and to ensure that any funding is secure and applied only to the agreed project programmes. Existing country risk profiles are used by other major international funding bodies and could form the basis of any such ranking.

Other risk items could be built into any assessment process. It should be noted that the risks should also be reviewed in combination, as well as individually to identify possible combinations of risk. The use of mitigation and insurance measures to offset perceived or identified risks should form part of the process of project development and assessment.

4.3.2 Likelihood of risks

This will be a matter of judgement and assessment by the project team developing new proposals under Marco Polo II and by Marco Polo II assessors, using a mix of quantifiable measures (e.g. country risk, commercial risk) and qualitative assessments for other identified parameters. The use of an agreed ranking mechanism (numeric or based on high, medium and low ratings) could be used to support decision-making.

The use of a matrix approach to calibrate the respective weightings of an individual project proposal against the risk categories and the spread of actions proposed under Marco Polo II might assist in this process using a mix of quantitative and qualitative measures.

Technical risk is the least likely given the use of existing technologies albeit in new circumstances and combinations of operation. Commercial and management risk are the two potentially highest risk areas. This will be most acute in countries without an established track record of commercial project development and management governed by financial management and audit/review methodologies. Political risk needs to be recognised to accommodate any major swings in political orientation and priorities that may have an adverse impact on any sanctioned projects.

4.3.3 Potential Impact of risks

The potential impact of individual categories of risk will need to be ranked against each project proposal to identify where the key risk elements are located and whether these are potentially fatal individually or in combination to any proposed project. There should be, as part of any project proposal, a risk mitigation strategy to minimise the impact of individual projects in the event of them failing wholly or in part to achieve their declared objectives. The liability for any failure should be very clear and attributable.

The impact of risks will need to be monitored throughout any sanctioned Marco Polo II project as an integral part of any review process. The risk profile of a project will be subject to change as it develops and any increasing risk category will need to be clearly identified and mitigation measures exercised. The risks could lead, at one extreme to the abandonment of a project, which has already expended EU funding support or at the other to a re-orientation and re-casting of a project to accommodate a new risk profile. This could delay the take up rate of projects and lead to a re-prioritisation of projects in favour of those deemed to be least at risk.

The impact of risks on the overall Marco Polo II programme will also need to be addressed to ensure a target level of successful projects and cumulative performance against measurable objectives. There are generic potential programme management risks relating to the achievement of the declared objectives in the time frame specified and the management of any over or under performance as the programme proceeds. Reviewing the overall performance of the programme on a frequent and regular basis at a detailed level should be an integral part of Marco Polo II with the ability to withdraw from failing projects and if necessary to suspend or close the whole programme if this is not working as intended.

4.4 Conclusions

The proposed Marco Polo II programme is seeking to develop practical niche multi-modal and traffic avoidance applications within the total transport domain, which are capable of replication. It is specifically addressing the issue of constraining road freight transport through effective short-term intervention by the use of practical projects using inter-modal technologies and traffic avoidance measures. These are generally intended to be cost-effective projects, using existing technologies, methods and systems with low risk profiles.

The cost profile of individual projects, identified under Marco Polo II may not be the lowest, but this will be mitigated by the manageable risks these projects carry, compared with other low cost proposals. Very low cost project alternatives may not be able to generate the wider project benefits, e.g. environmental, social impacts, compared to individual higher cost project proposals.

Marco Polo II has been reviewed against a series of alternative delivery mechanisms and risk categories and has, as currently conceived, significant intrinsic strengths. Marco Polo II is intended as a robust, practical and focused programme, which builds on the existing Marco Polo programme and has the merit of expanded scope to achieve the key objectives.

5 Analysis of European Added Value

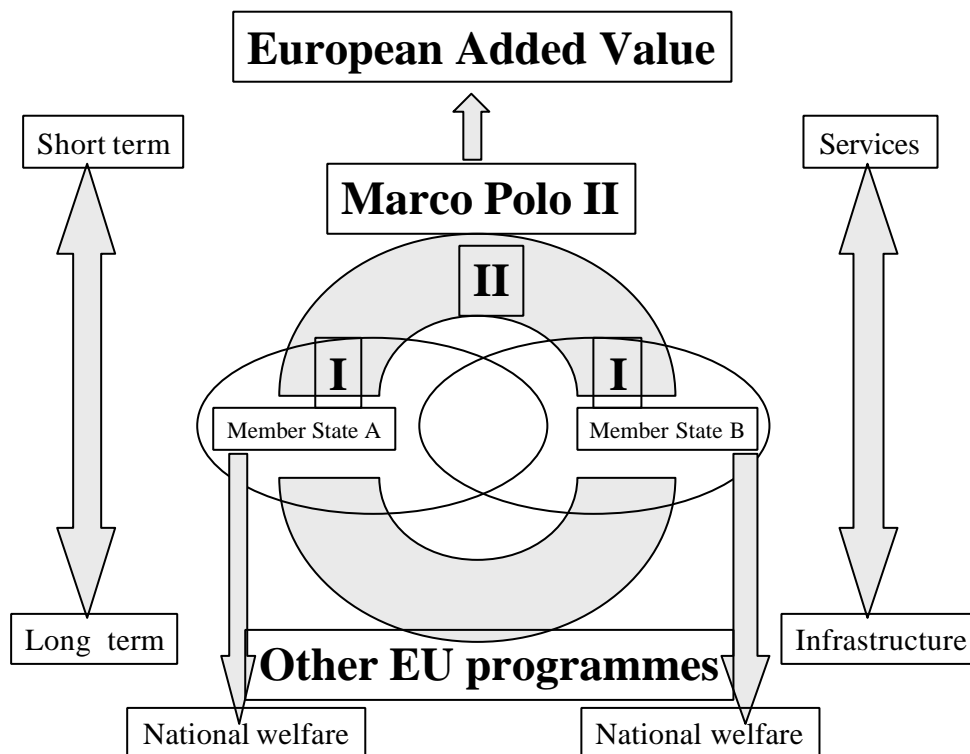
5.1 Introduction

The reason to analyse the European Added Value of Marco Polo II is to demonstrate that there is a rationale for taking action at EU level and that the instrument used adds value to what is done elsewhere (particular on national level). There should be synergy between interventions at national and EU level.

In order to define whether this synergy exists, the following approach is followed:

1. Inventory of modal shift and traffic avoidance programmes carried out at Member State level and other EU programmes/projects;
2. Comparison on complementarities (no duplications) and coherency (no undermining, conflict of interest or contradictions). Based on these two comparisons a conclusion on synergy can be drawn.

These two steps are dealt with subsequently in this section. Firstly the hypothesis on the Added Value of Marco Polo II is given.



5.2 Hypothesis on the European Added Value of Marco Polo II

The picture above gives the general idea on the European Added Value of Marco Polo II. It compares the several national programmes and puts them in perspective.

The reasoning or hypothesis behind this picture is that:

- National programmes will aim at creating added value for that particular country.
- Modal shift (intermodality) in general is more successful on long distances routes, thus international.
- National programmes will partly already provide international solutions.
- Any European programme, including Marco Polo II, which will not be an exception, will have solutions that have national impacts.
- Other EU programmes also focus more on the long-term prospects.
- Marco Polo II will create synergy within the several national programmes on modal shift and traffic avoidance (area I in the picture).
- Marco Polo will aim more at the service level on international transport chains, area II in the picture (more short/medium term) and not that much on nationally oriented infrastructure (medium to long-term), and therefore it will be complementary.

5.3 Inventory of programmes

5.3.1 Inventory of Member State programmes

There are several questions that need to be answered regarding the Member State level interventions on modal shift and traffic avoidance. These questions are based on the general scheme as presented in the last subsection. The questions are:

1. What are the goals of these national programmes, and do they aim at domestic traffic more than at international traffic?
2. Are the national programmes coordinated between countries?
3. What elements do the national programmes contain: infrastructure or services?
4. Would any of the programmes or projects be duplicated by Marco Polo II?
5. Would any of the programmes or projects be undermined by Marco Polo II?

In Tables 5.1-5.5 the result of the analysis is presented. The analysis has been done both in qualitative as in quantitative terms, and is based on a description of these programmes made for the **EUTP** project⁵. These descriptions can be found in Annex 4. The information that was taken from this project has been updated in order to have the most recent information available. The quantitative analysis gives the percentage of the Member States programmes or projects for each of the possible answers.

⁵ Thematic Network to support European intermodal freight transport research

Table 5.1 Answers to question 1: What are the goals of the national programmes, and do they aim at domestic traffic more than at international traffic?

Focus on domestic traffic	Focus on international traffic
78%	22%
<p>Description</p> <p>Most of the analysed programmes are relatively more focused on the domestic transport solutions. They have a long-term view, aiming at sustainability and accessibility of their regions. In some countries the investments are even made by the regional authorities, not nationally.</p>	<p>Description</p> <p>Some countries do have a relatively high focus on preparing for international traffic. Not surprisingly, they are the so-called “transit-countries” like Germany, Austria. But also Italy has a high focus on the international traffic.</p>

Table 5.2 Answers to question 2: Are the national programmes coordinated between countries?

National programmes coordinated with other countries	National programmes not coordinated with other countries
28%	72%
<p>Description</p> <p>A few programmes have an explicit international coordination task. Sweden is one of the examples; the coordination is mainly aimed at the Baltic region.</p>	<p>Description</p> <p>The majority of the programmes are not coordinated with other countries or with the EU in general. They are mostly initiated, controlled and monitored by the national ministries of Transport. This does not mean that there is no international coordination at all, but the specific programmes do not seem to be internationally coordinated.</p>

Table 5.3 Answers to question 3: What elements do the national programmes contain: infrastructure or services?

National programmes focus on services	National programmes focus on infrastructure
33%	67%
<p>Description</p> <p>A third of the programmes have a relatively high aim at services within the modal shift/intermodal area. Most of these programmes recognize the importance of integrating the services.</p>	<p>Description</p> <p>The majority, though not as big as with the other questions, of the programmes aims at infrastructure as a means to enhance intermodality or to change the modal shift. This is often seen as the essential task of the national governments regarding transport measures.</p>

Table 5.4 Answers to question 4: Would any of the national programmes or projects be duplicated by Marco Polo II?

Risk of duplication between national programmes and Marco Polo	No risk of duplication between national programmes and Marco Polo
33%	67%
<p>Description</p> <p>For less than 30% of the programmes it was concluded that there is a risk of duplication, in other words, the measures or project within the programme could also potentially be part of a project within the Marco Polo II.</p>	<p>Description</p> <p>Again for the majority of the programmes there seems to be no duplication.</p>

Table 5.5 Answers to question 5: Would any of the national programmes or projects be undermined by Marco Polo II?

Marco Polo undermines national programmes	Marco Polo does not undermines national programmes
0%	100%
<p>Description</p> <p>A clear result: none of the programmes should be undermined by Marco Polo II. The intended goals are not contradicting, and also the specific measures taken look to be in line.</p>	

New EU-Member States

The EUTP project did not involve any new Member States. However, the direction of the answers as stated in the previous section, is believed to be more or less the same in the new Member States, i.e. focus on domestic programmes, little international co-ordination and infrastructure focus. Duplication and undermining of Marco Polo II are not likely; on the contrary, Marco Polo II is expected to be complementary to the national programmes.

The pre-transition period has left most Central and Eastern European Countries with a relatively well-developed rail sector and a relatively underdeveloped road sector. In the transition period this picture is rapidly changing with strongly increasing road sector performance, both in freight and passenger transport and political priority being placed on road infrastructure development. Marco Polo II, by focusing on intermodal rail services, provides a basis to retain (some of) the attractiveness of the rail sector; this in co-ordination with infrastructure programmes, i.e. Trans European Networks.

For the entire Marco Polo II programme, it is likely that the inclusion of the new Member States will provide further opportunities, since long distance transport to and from these countries are well suited for intermodal transport. Based on experience within other projects, it is concluded that the new Member States are likely to turn to intermodality as a viable transport solution.

5.3.2 Inventory of other EU-programmes

In September 2001 the Commission submitted White Paper: "European transport policy for 2010: time to decide". In this White Paper the Commission has proposed measures to develop a transport system capable of shifting the balance between modes of transport, revitalising the railways, promoting transport by sea and inland waterways and controlling the growth in air transport. In this way, the White Paper fits in with the sustainable development strategy adopted by the European Council in Gothenburg in June 2001.

The White paper has a specific objective, analysis of the problems and measures for each of the target transport modes. Table 5.6 presents the objectives.

Table 5.6 Objectives in the White Paper

Mode	Objective
Road transport	To improve quality, apply existing regulations more efficiently by tightening up controls and penalties.
Rail Transport	To revitalise the railways by creating an integrated, efficient competitive and safe railway area and to set up a network dedicated to freight services.
Air Transport	To control the growth in air transport, tackle saturation of the skies, maintain safety standards and protect the environment.
Sea and inland waterway transport	To develop the infrastructure, simplify the regulatory framework by creating one-stop offices and integrate the social legislation in order to build veritable "Motorways of the Sea".
Intermodality	To shift the balance between modes of transport by means of a pro-active policy to promote intermodality and transport by rail, sea and inland waterway.
Bottle necks and trans-European networks	To construct the major infrastructure proposed in the trans-European networks programme, identified by the 1996 guidelines, as well as the priority projects selected at the 1994 Essen European Council.
Users	To place users at the heart of transport policy, i.e. to reduce the number of accidents, harmonise penalties and develop safer, cleaner technologies.

In Annex 5 more detailed information on these subjects can be found. In this description also the measures proposed are identified. It can be stated that Marco Polo II is part of an integral approach towards transport in Europe. Together with programmes, such as the Trans European Networks, it aims at achieving the overall objective of the White Paper: 'to strike a balance between economic development and the quality and safety demands made by society in order to develop a modern, sustainable transport system for 2010'.

Research Framework programmes

Next to the measures, programmes and projects directly related to the White Paper, the Commission initiates Research Framework Programmes. These Research Framework Programmes focus on new and innovative (technological) solutions, within a long-term perspective. Within the Research Framework programmes these solutions are defined and tested. The Marco Polo programme will build on the expertise of these Research Framework Programmes.

5.3.3 Trans European Networks

On July 1996 the European Parliament and Council adopted Decision N° 1692/96/EC on Community guidelines for the development of the trans-European transport network (TEN-T). These guidelines comprises roads, railways, inland waterways, airports, seaports, inland ports and traffic management systems which serve the entire continent, carry the bulk of the long distance traffic and bring the geographical and economic areas of the Union closer together⁶.

The legal basis for the TEN-T is provided in the Treaty on the European Union. Under the terms of Chapter XV of the Treaty (Articles 154, 155 and 156), the European Union must aim to promote the development of trans-European networks as a key element for the creation of the Internal Market and the reinforcement of Economic and Social Cohesion. This development includes the interconnection and interoperability of national networks as well as access to such networks.

The Commission, to take account of Enlargement and expected changes in traffic flows, recently proposes a more fundamental revision the TEN-T Guidelines. New outline plans for 2020 are drawn up with the aim of efficiently channelling trans-European traffic in an enlarged Union. In this context the Commission will consider, amongst others, the idea to concentrate on a primary network made up of the most important infrastructure for international traffic and cohesion on the European continent and to introduce the concept of *Motorways of the Sea*.

5.4 Comparison

5.4.1 Member State programmes

Based on analysis of the Member States programmes, the following conclusions can be made:

1. The majority of Member State programmes aim at the national objectives and do not take into account the added value of international coordination.
2. Marco Polo II is focusing on shifting international freight transport off the roads, this seems to be complementary to most of the national programmes.
3. Furthermore and given the fact that the potential for modal shift/intermodal transport is higher for longer transport chains, mostly international, in Europe, there is a need for a European intervention. It cannot be expected that the Member States will take up all the required action for these opportunities.
4. There is a risk of duplication, since quite a large amount of effort within the national programmes is also spent on the same type of projects. This risk could, however, be dealt with within the framework of the Marco Polo II. This is a change to create a higher level of efficiency and effectiveness.
5. It is absolutely clear that the Marco Polo II will be coherent with the national programmes; there is no sign of contra productivity or large conflicts of interest.

⁶ Source: website EC on TEN-T.

5.4.2 Other EU programmes

Based on analysis of the other relevant EU programmes, the following conclusions can be made:

1. The Marco Polo II programme is part of an integral approach toward transport, it is complementary to other measures proposed in the White Paper, such as the trans-European networks;
2. The goals of Marco Polo II are thus also in line with the measures proposed in the White Paper, Marco Polo II will therefore be coherent with the other programmes;
3. The Research Framework Programmes and Marco Polo II can also be seen as complementary programmes. The Research Framework Programmes focus on the long-term development of (technological) solutions, Marco Polo II on the (short-term) implementation of new concepts.

5.4.3 Trans European Networks

The Trans European Networks programme focuses on the development of roads, railways, inland waterways, airports, seaports, inland ports and traffic management systems in order to strengthen the creation of the Internal Market and reinforce Economic and Social Cohesion within the Union. The *Trans European Networks* (TEN-T) programme focuses on the development of roads, railways, inland waterways, airports, seaports, inland ports and traffic management systems in order to strengthen the creation of the Internal Market and reinforce Economic and Social Cohesion within the Union. The basic differentiation between Marco Polo and TEN-T funding is the intrinsically different nature of the two instruments. TEN-T is an instrument to construct a European infrastructure network, with long-term goals such as development of the internal market and economic and social cohesion. These considerations are largely absent from Marco Polo. Marco Polo is a market-oriented, demand driven instrument focussing on sustained modal shift achieved by transport services.

Projects financed under Marco Polo are less costly and their implementation period is much shorter compared to TEN-T projects. The construction of a railway tunnel, for instance, across the Pyrenees, would take at least 15 years and cost several billion euros compared to a maritime service co-financed in the framework of a Marco Polo – Motorways of the Sea project. The beneficiaries of Marco Polo are exclusively undertakings striving to achieve short- and mid term commercial goals. Economic operators relying largely on their own commercial initiative to set up new services for economic gains will naturally turn to Marco Polo and have the necessary infrastructures co-funded by this instrument.

Motorways of the Sea are a particular field of interest. As stated in the White Paper: ‘certain shipping links, particularly those providing a way around the bottlenecks in the Alps and Pyrenees, should be made part of the Trans European Networks, just like motorways or railways’. The Trans European Networks programme, on the hand, should

ensure hinterland connections from and to the ports, integrating the Motorways of the Sea into the Trans European Networks. On the other hand, Marco Polo, by supporting intermodal services to make use of the Motorways of the Sea, will contribute to raising a sufficient traffic volume to validate the Motorways of the Sea.

5.5 Conclusions

Modal shift and traffic avoidance programmes at a national Member State level are complementary to and coherent with the Marco Polo programme, as these national programmes primarily focus on domestic transport, infrastructure provision and do not concentrate on international co-ordination. For the new Member States, of which many are geared towards road infrastructure development, Marco Polo provides a basis to retain (some of) the position of the rail sector.

Marco Polo, as part of the integrated approach towards transport in Europe, as defined in the White Paper, is coherent with other EU programmes, including the Research Framework programmes. Marco Polo, focusing on services, especially forms a strong combination with the Trans European Networks programme, providing the infrastructure of which the services will make use.

6 Lessons from the past

6.1 Introduction

The Marco Polo programme is formally the successor of the PACT (Pilot Actions on Combined Transport) programme, and broader in scope, budget and ambition level. PACT started on 1 January 1997 and came to an end on 31 December 2001.

On 4 February 2002, the European Commission has proposed the Marco Polo programme⁷. The Commission had this proposal adopted by the European Parliament and the Council in July 2003. In order to bridge the gap between the two programmes, and to test certain features and ideas of the Marco Polo programme, the Commission issued the Mini-Call Catalyst Action 2002.

Marco Polo II will succeed the first Marco Polo programme. In order to learn from best practices, PACT and Marco Polo I, as well as selected national programmes, are evaluated in this chapter. The complete evaluation can be found in Annex 6.

6.2 Brief overview of PACT and Marco Polo

Both PACT and Marco Polo I are geared towards promoting commercially oriented services in the freight transport market. Infrastructure measures are not included in either programme.

The new Marco Polo II programme will continue to broaden the scope. The activities started with the Marco Polo I programme will be continued, enhanced and new activities are to be included. Furthermore, it will provide support to a wider range of countries. The programme shall also be open to participation by the EFTA⁸-countries, all countries on the Mediterranean and Black Seas, the western Balkan countries and Belarus, Ukraine, Moldavia and Russia, on the basis of supplementary appropriations in accordance with procedures to be agreed with those countries⁹. Under the new Marco Polo II programme, funding of supporting infrastructure for selected actions is allowed.

Table 6.1 provides a brief overview of the different programmes.

⁷ COM 2002(54) final.

⁸ EFTA countries: Iceland, Switzerland, Norway and Liechtenstein.

⁹ Source: 'Amendment (EC) no XXX to the Regulation (EC) No 1382/2003 of the European Parliament and of the council', draft 02-04-2004.

Table 6.1 Overview of PACT, mini-call, Marco Polo I and Marco Polo II

	PACT	Mini-Call Catalyst Action 2002	Marco Polo I	Marco Polo II
Period	1997 to 2002	2002	2003 to 2006	2007-2013
Budget	€35 million	€2 million. The Commission envisages to fund not more than 3 projects under this call	€75 million ¹⁰ for EU-15 and €100 million for EU-25 for programme duration	Annual budget calculated at some €120 million ¹¹ per year
Objectives and eligibility conditions	To give financial assistance to innovative projects which contribute to increased use of combined transport and encourage modal shift (from road to more environmental friendly modes of transport) through: increasing the competitiveness of combined transport; promoting the use of advanced technology in combined transport; and improving the possibilities of supplying combined transport services.	To give financial assistance to Catalyst Actions in the non-road transport market to lead to a modal shift from road to short sea shipping, inland waterways or rail. Actions are to contribute reducing congestion in the road freight transport system and/or to a better environmental performance of the transport system. The action must have an international character (project is situated on the territory of at least two Member States). Catalyst action here means any innovative action aimed at overcoming structural barriers in the market for freight transport which impede the efficient functioning of the markets, the competitiveness of short sea shipping, rail or inland waterways and/or the efficiency of transport chains making use of these modes.	To give financial assistance to actions that reduce road congestion and improve the environmental performance of the freight transport system within the Community and to enhance intermodality. Three types of actions are featured: 1 Modal Shift actions: just shift freight off the road 2 Catalyst actions: to overcome structural market barriers in European freight transport through a highly innovative concept: causing a break-through. 3 Common Learning actions: improvement of co-operation and sharing of know how: Coping with an increasingly complex transport and logistics market.	See Marco Polo I. The programme is not only aiming to contribute to the three type of actions under Marco Polo I but also on: 4 Motorways of the Sea: actions that shift freight from road to short sea shipping, rail, inland waterways or a combination of modes of transport, including the creation of the necessary infrastructure, to rapidly implement a very large volume, high frequency intermodal transport service. 5 Rail Synergy Action: to implement a rapid, high frequency intermodal transport service using the same transport services and intermodal infrastructure for freight and passenger in order to shift freight from the road to other modes (short sea, rail, inland waterways) 6 Traffic Avoidance Action: integrating production into transport logistics to avoid a large percentage of transport of any mode, including the creation of the necessary infrastructure, including production infrastructure and equipment.

¹⁰ Source: 'PACT and Marco Polo', European Commission, DG TREN, Brussels, 2004.

¹¹ See Section 8.2: Assessment of Marco Polo II budget.

6.3 Relevance of strategy

With regard to the strategy of PACT, Marco Polo I and Marco Polo II the following conclusions can be drawn:

- The strategy has slightly changed over time. To give financial assistance is still the core of all three programmes; the type of initiatives that can receive financial assistance has broadened in time. In PACT only combined transport actions are supported, in Marco Polo II this has evolved into six types of actions of which five can be characterized as Modal Shift Actions, the other is aimed at transport reduction.
- The strategy of all three programmes is short-term and bottom-up. Projects have to be viable within in the short period that a subsidy is given. In order to preserve and maintain the successfulness of a project, a critical factor is the sustainability of the projects (after the subsidy has stopped). In order to determine this, projects should be monitored for a longer time.
- Goals have not been quantified in PACT, which makes it difficult to determine the effectiveness. In Marco Polo I and Marco Polo II the tonne-kilometre objective is quantified; the external benefits are based on calculations.
- Programmes do not specifically focus on certain branches and types of companies. The effect of the programmes could benefit from specific attention given to companies with for example a high environmental ‘attitude’, companies who have a good image or are integrators.
- The programmes now aim at a pull strategy; i.e. reduction of costs by giving a subsidy. A push strategy can enhance the effects (environmental awareness, sound behaviour, image).
- Emphasize the relevance of dissemination in the strategy. Based on the website of the current Marco Polo programme and the evaluation of the PACT programme it appears that the transfer of knowledge and information to the companies and broad (combined) transport community that may replicate the experiences from projects performed could be improved. For example on the Marco Polo website no (summary) reports can be found on the experiences of projects.

6.4 Effectiveness

PACT and Marco Polo I contribution to shift in international road freight

Effectiveness refers to the changes/effects resulting from executing a project or a programme compared to the goal of this project or programme. As mentioned in the previous paragraph the goal of the PACT programme is not quantified. The effectiveness of PACT is therefore determined by assuming that PACT pursues the same goal as Marco Polo I, i.e. to shift an amount of cargo corresponding to the whole anticipated growth of international road haulage to alternative modes.

Table 6.2 indicates the contribution of PACT and Marco Polo I in shifting international road freight off the road.

Table 6.2 Effectiveness of PACT and Marco Polo I

	PACT	Marco Polo I
(Expected) result: shift in tonne-kilometres	11 billion in 5 years	13.65 billion (only first call in 2003)
Increase in international road transport (tonne-kilometres)	Period 1997 – 2001 (5 years period): 58	2003-2006 (4 years period): 48
Annual % contribution of the programmes	19%	>100% (only based on first call)

Remarks based on the above:

- The expected result in tonnes shifted is based on the Marco Polo I first call (2003).
- For PACT the increase in international freight transport is based on EU-15 average annual increase figures in the period 1998-2013, i.e. 186 billion tonne-kilometres /16 year equalling 11.6 billion tonne-kilometres /year.
- For Marco Polo I the increase in international freight transport is based on an average increase in international road transport of 12.0 billion tonne-kilometres /year.
- Marco Polo I (first call) is more effective than PACT (>100% vs. 19%), reflecting the different ambition levels of the two programmes.
- Based on the results of the first call and the expected total Marco Polo I budget, Marco Polo I could be in a position to deliver the objective in terms of shifted tonne-kilometres off the road for the entire programme duration.

External benefits of PACT and Marco Polo

In PACT no estimate is made of the environmental effects of the shift in tonne-kilometres. For both PACT and Marco Polo I external benefits are calculated, based on the tonne-kilometres shift, resulting in considerable impacts.

Mini-Call projects failed as a result of lack of infrastructure funding

The Mini Call that was launched in 2002 resulted in three Catalyst Action projects. All three projects failed. Although all three projects had their own characteristics and were unique in a way, all projects suffered from the inability of having infrastructure funded under the Mini-Call.

6.5 Efficiency

Efficiency in tonne-kilometre shifted off the road

To compare the efficiency (EU subsidy per tonne-kilometre shifted off the road) of the PACT and Marco Polo I programme the following table has been constructed:

	PACT	Marco Polo I
Shift in tonne-kilometres	11 billion in 5 years	13.65 billion (6.83 billion)*
EU-subsidy	30 million in 5 year	14.94 million
Tonne-kilometre shifted per euro	367	914 (457)*

* If a success rate of 50% is applied, modal shift is reduced from 13.65 to 6.83 and tonne-kilometre shift per euro is reduced from 914 to 457 (see also Section 10.27 cost effectiveness).

Remarks based on the above:

- The PACT figures are based on completed projects, reflecting actual tonne-kilometre shift. Marco Polo figures are based on ongoing projects of which some may fail (see next bullet).
- Marco Polo I figures only refer to the first 2003 Call. Total Marco Polo I budget (2003-2006) is estimated at 75 million euro for EU-15, 100 million euro for EU-25. As Marco Polo I projects are ongoing and some projects may not be successful, the tonne-kilometre shift should be adjusted by applying a success rate. Based on a success rate of 50 percent, total tonne-kilometre shift would amount to 457.
- It can be concluded that the tonne-kilometres shifted off the road per euro has increased in Marco Polo I compared to PACT, highlighting the increased efficiency of Marco Polo I, as compared to PACT.

External benefits

Analysis of the Call 2003 of Marco Polo suggests that the average environmental benefits are estimated at 15 euro for 1 euro of EC-subsidy. The ex-ante evaluation of PACT concluded that the programme was cost-effective in terms of avoided carbon dioxide emissions. Section 9, impact assessment provides information on Marco Polo II external benefits.

6.6 Critical factors

There are many critical factors that determine whether a programme like Marco Polo can be characterized as a success or not. In this section, only the critical strategic factors that have played a role in the performance of PACT and Marco Polo I (only the first call) are mentioned.

Quantification of goals

Marco Polo II objectives need to be defined and quantified (as verifiable as possible) in order to determine the effectiveness of the programme.

Data requirements

The Commission needs to specify data requirements in order to be able to determine the effectiveness and efficiency of the new Marco Polo II programme in its tender procedure.

Feasibility and sustainability

In general, feasibility addresses the practicability of a project. A project is comprised of a set of activities aimed at certain objectives, and depends on the use of a number of resources. A project is feasible if the availability of these resources can be secured, and if they are used in such a way that the project objectives are achieved. Feasibility concerns the entire lifetime of a project.

Sustainability, on the other hand addresses the continuation of the project itself after donor support has ended. Projects that only provide short-term benefits should be rejected. Formulated in this way, sustainability focused on the long-term is a particular aspect of feasibility focused on the entire lifetime of a project.

In order to preserve and maintain the successfulness of the Marco Polo II programme, a critical factor is the sustainability of the projects. In order to determine this, projects should be monitored for a longer time beyond the initial support duration.

Dissemination

The evaluation of the PACT programme indicated the need to strengthen dissemination of results. This requires a clear strategy defining the roles of all participants in the project. Dissemination of the success stories also supports objectives such as replication and common learning.

Management

The expected increasing budget in Marco Polo II, compared to Marco Polo I and PACT, could be a risk for proper management. From PACT it was also concluded that record keeping on progress monitoring activities and Steering Group meetings was relatively low. This needs to be encouraged, since it makes the records of projects more transparent and accessible to staff new to the programme, especially when the number of participants and project budget increase and human resources to manage the programme are limited.

Infrastructure funding

One key reason for the failure of the three Catalyst Actions in the Mini-Call is the inability to fund infrastructure under the 'old' programme. Including infrastructure funding in Catalyst Action projects in the 'new' programme will improve the attractiveness of Catalyst Action projects.

6.7 Lessons from other sources

Not only on a European scale are efforts being made to improve the environmental performance of the freight transport system, also in the individual countries efforts are made by introducing special programmes. Here the main findings of two programmes are described (more information can be found in Annex 6).

Transport reduction

The project Transport reduction in The Netherlands is partly comparable with the Traffic Avoidance Actions in Marco Polo II. The transport reduction project was introduced in 1998 and aims at reducing the transport of goods without impeding economic growth. Two clusters of measures exist in order to reduce the transport of goods: reduction of volume and/or weight and reduction in distances travelled. Projects that receive subsidies are feasibility studies, demonstration projects and knowledge transfer projects (consciousness-raising project). More on the transport reduction programme can be found in Annex 6. The main findings of the programme are:

- Most of the projects concern feasibility studies (57%) followed by demonstration projects (41%).
- A total of 70 projects have been performed during a 4-year period with a total of 16,5 million euro of project costs.
- To get spin-off, the case studies must be very specific: other companies must recognize their possibilities in order to be able to apply them.

- The resulting modal shift impact from the project is unknown, the same accounts for the environmental impacts.

The external evaluation recommendations following the Transport Reduction programme are:

- Set targets: what is the amount of tonne-kilometres reduction that a project is aiming to achieve.
- More systematic monitoring of the projects.
- Improve dissemination of the results.
- Give more attention to knowledge transfer projects as they play an important role in the raising of consciousness and behavioural changes.
- Stimulation of innovative projects needs good guidance during the preparation of proposals and the providing of assistance to project leaders.

Freight Facilities Grant (FFG)/Access Grant (TAG)

In the United Kingdom two types of grant are available to help meet the extra costs generally associated with moving freight by rail in order to achieve environmental and social benefits. Grants are made towards the capital costs of rail freight handling facilities (FFG) or track access grants (TAG). Grants up to 100% of access charges are not uncommon while for FFG grants offered are typically around 50%. In some circumstances, however, much higher levels of FFG have been offered.

The volume of traffic moved from the road to rail as a result of grant support, both FFG and TAG, was in 2002 at its highest level since recording began, totalling over 9.6 million tonnes of bulk, 961.000 containers and 189.000 automotives.

Between 1 February 2001 and 31 March 2002, 23 offers of FFG were formally accepted, the average FFG per project amounted to 2,3 million euro. These grants will save an estimated 554 million lorry kilometres over the next five to ten years. This results in a UK-subsidy per lorry-kilometre shifted of 0,09 euro.

In the same period 21 formal offers of TAG were accepted with around a grant of 570.000 euro per project. These projects will remove around 219 million lorry km, i.e. a grant of 0,06 euro per lorry km shifted. In the period 2002/2003 the TAG amounted to 0,12 euro per lorry km shifted.

An external evaluation of TAG led to the following conclusions:

- TAG is effective at the tactical level in supporting the transfer of freight to rail.
- TAG represents value for money.
- The scheme is efficiently administered.
- The scheme should be reviewed again in the future once the new track access charges structure have been fully implemented.
- Small changes to the economic methodology should be implemented.

A review and update of the economic methodology for FFG and TAG is near completion.

6.8 Conclusions

PACT and Marco Polo I (first call only) provide valuable lessons to be learned for Marco Polo II in a range of areas, e.g. strategy, accessibility and selection procedure, effectiveness, efficiency and programme management. In addition, specific national initiatives, such the transport reduction programme in the Netherlands and the freight facilities and access grants in the United Kingdom, provide more practical experience from which the new programme can draw. Details on lessons learned are presented in Annex 6.

7 Stakeholders' consultation

7.1 Introduction

This section comprises results of the stakeholders' consultation, based on interviews and completed questionnaires, reflecting the opinion of the consulted people. A list of stakeholders consulted and the questionnaire used for consultation is included in Annex 9.

7.2 Experiences with PACT and Marco Polo I

PACT is seen as an initial programme with a rather limited scope, opening up the way for follow up programmes with a broader orientation that resulted in MP. Also, PACT opened the way for new funding schemes on a national level. PACT is considered to have been a well-managed programme, with fast decisions on contractual subjects and professional people involved. On the other hand, it lacked funding of accompanying infrastructure. Some respondents see PACT as a flexible programme: the rules were practically oriented, which made different types of projects possible. PACT is considered to have opened the discussion on incentivising modal transfer, and to have shown the need for and relevance of a long-term approach of modal transfer pushed by political imperatives, whereas commercial parties tend to focus on immediate and short-term goals thereby ignoring the big picture.

On the other hand, Marco Polo I is thought to be more broadly oriented than PACT, not only being oriented at standard combined transport. A positive point that was mentioned is that the Common Learning Actions could create more awareness of multimodal transport with decision makers and thus have a positive long-term effect. Also the other actions that were new compared to PACT were positively valued. One respondent praised the EC for their understanding of the key issues, their anticipation of the likely trends and their ability to plan accordingly. The principles are well directed, the challenge now is to convince business that the MP programmes are essential tools in transport planning.

The more critical sounds to be heard about Marco Polo I focus foremost on its much more complex application procedures. Thus, SMEs in particular have less chance to participate in the programme, due to the high funding thresholds, and the high costs involved in coping with the administrative procedures and getting bank guarantees. This does not lead to improvement of the contents of the programme, at best only to procedural improvement. It must be said that some respondents also considered PACT as having a high barrier to SME access. The budget is generally considered as too small: only 1 out of 10 projects will actually receive funds and the budget is insufficient to create major changes in attitudes across all Member States. The profiling of Marco Polo I on the

market was also considered insufficient by some respondents, as many senior people within the industry seem to be unaware of the programme.

The tonne-kilometre reduction criterion is thought to be too inflexible and to rule out some potentially successful projects that do not involve shifting heavy goods. In rail, the focus should be on fast moving consumer goods and reefer traffic, instead of on moving low value bulk commodities. A combined criterion also involving volume or number of trucks could solve this. Alternatively, the criterion could be expanded to take into account where the tonne-kilometre shifted off the road come from; e.g. do they come from highly congested or sensitive areas? The current criterion also favours mainly long distance projects, whereas short distance projects could really help alleviate congestion. The costs for extra handling of cargo in the intermodal transport chain should be considered in short distance cases, since it does not relate to distance but does impact modal choice. The tonne-kilometre criterion also does not fit very well to the Common Learning Actions that should be judged by other measurable criteria.

There are doubts about the formula used to calculate the environmental benefits of a project. Especially the railway community fears it favours short sea shipping projects through a too positive calculation of the environmental burden of ships as compared to truck. When comparing modern truck engines with outdated ship engines or high-speed ship engines, the environmentally favourable option might even be road.

7.3 The Marco Polo II programme

Marco Polo II target groups and beneficiaries

Generally said, the target groups should be those involved in shifting cargo (operators, shippers, logistics organizers) and who bear the risk of the projects. The beneficiaries should be transport users, because they need the incentive to shift their cargo. It was also suggested that the shippers should be the focus of the Common Learning Actions, as they make the decisions. Other target groups of the Common Learning Actions could be Chambers of Commerce and regional or local authorities. Other actions would best be aimed at the forwarder. Beneficiaries could also be inland terminals, be it rail or inland waterways, with support for infrastructure costs (new or adapted). The project should also consider the new Member States in 2007 and preferably allow inclusion of services from and to CIS states.

It was stressed that Marco Polo II should not be seen as an alternative to market liberalization, especially in rail. This aim should not be lost, but meanwhile Marco Polo II should provide support in cases where the market is not yet functioning freely and there are market obstacles for developing services.

Involving the beneficiaries

The opinions on whether the programme is well known or not differ. Some respondents say it's relatively well known, others say it is far from that. Using its success stories to promote it could enhance this. Open consultations, working groups on specific issues, Europe wide seminars, round table activities at different levels, or tailor made dissemination of aid opportunities, could all help reach the beneficiaries, often with the

help of stakeholders' organizations. Next to promoting the programme, the goal should also be to raise the level of debate and to have the industry migrate from short-termism to longer term strategies.

Possible negative side-effects and risks

A possible negative side effect could be the funding of projects that are limited in time and effect after the aid period. A penalty system could avoid non-viable projects from being submitted or from using public funds. Also mentioned as possible negative side effect is distortion of competition, but the remark is that any public funding project will lead to a certain distortion, which is considered justified as long as its contributing to general benefits in the context of sustainable growth. Creating too high expectations are another risk, as the programme will certainly be judged on living up to these expectations, compared with the budget spent on it. It should be recognized that many companies may be very insular in their aims and participate in the programme whilst ignoring its political imperatives on congestion and environment. Marco Polo II should try to counteract this.

Another possible negative side effect is shifting cargo from one alternative mode to the other, or shifting tonne-kilometres off the road whilst losing more somewhere else. Thus the programme could seem successful with quick successes, but at the same time lose cargo. Hence, the focus should not be on shifting alone, but also on keeping traffic (rail still has a declining market share).

The 18 months prerequisite for the infrastructure building makes applications for grants from different countries depend on the performance of their respective national administrations (e.g. building permits) and market conditions. This rule should therefore be more flexible.

Expectations form the programme and contribution to objectives

In general, experience of the Marco Polo I, first call should be taken into account and the new programme should, if necessary, be adapted accordingly. The inclusion of certain infrastructure funding will certainly contribute to improve the programme, whereas the risk that Marco Polo II is mixed up with an infrastructure-funding programme per se should be seen; infrastructure funding should always be embedded in an overall modal shift context. Other expectations are: an effective programme management with short reaction time on contractual issues and payment, effective and lasting shifts, excellent opportunities to include inland waterway transport.

Others say the objectives might be an illusion. The framework conditions are still in the way and need to be changed. Marco Polo II can only be a programme on the side, helping out until framework conditions have been improved, but even for this the budget may be too limited. Major steps will still have to come from liberalization. Also the new members states invest heavily in road infrastructure, which will inevitably lead to shifts to road.

Added value of Marco Polo II on European level

Due to the cross-border character of a large part of freight transport, it has to be carried out on a European level. However, some consider the multi-nationality criterion a bit artificial, as freight transport is not per se between different countries, but between

different industrial centres. Others consider it a necessity to be able to speak of a European programme. The Marco Polo II programme but should look for interaction and complementarity with national schemes.

7.4 The defined actions

Modal Shift Actions

These are considered a good complementing approach of the Catalyst Actions, as they offer the possibility to shift cargo in a very short period of time. The charm is in the absence of highly sophisticated solutions; these actions lead to making smart combinations of existing, proven solutions. A danger is that after the subsidy period the project falls back into its previous state and thus no longer contributes to Marco Polo II goals. They could probably be considered cost effective if all external costs are taken into account. The rail community fears this is the only action that can be offered by rail.

Catalyst actions

As opposed to Modal Shift Actions, the innovative character of Catalyst Actions offers the possibility to provoke long-term shifts through innovative concepts and can be seen as very useful to initiate new traffic patterns. Others think the innovative character is artificial and could create “Concorde” type of solutions: technically superior but economically unfeasible. Catalyst actions tend to require higher involvement of stakeholders in the development process, therefore possibly have a slightly less feasibility than Modal Shift Actions. Still, these actions could possibly serve as role models on how structural barriers can be overcome, and therefore the market should have a per se interest in CA.

Motorways of the Sea

There is no reason to introduce “Motorways of the Sea” as a separate instrument within Marco Polo II. As all alternative modes of transport (Rail, IWT, Short Sea) should be treated equally, a privileged situation of one market cannot be justified. The overall goal is a more balanced, less congested and sustainable transportation system. Enhancing a seamless operating integrated transportation chain will bear more fruit than privileging one part of this chain. This action runs a substantial risk of shifting cargo from rail to sea. Therefore market acceptance is thought to depend on the integration into a holistic transport concept, including hinterland connections via inland navigation and rail, if it remains a service from sea port to sea port without any concept related to the hinterland it will not be accepted by the market.

Rail synergy¹²

This action is received with great scepticism. Cargo and passengers are considered to have different needs without any market synergy. In rail, the point would be exactly the opposite: separating passengers from freight as freight operations are now dictated by passenger operations. Also, a good step would be combining conventional freight with containers. Some possibilities are seen in the field of courier and parcel services, but then

¹² By the time of consultation, this action was defined as integrated freight-passenger transport services, which was narrower than railway efficiency.

the evidence is against these ideas: in most European countries the post has meanwhile taken these services from rail onto the road or into the air. Only ferries are considered to fit within this action, but the goal of Marco Polo II can't be setting up new ferry lines.

Common Learning actions

As an instrument of dissemination and creating awareness this type of action is very successful. There is a strong need for better education, dissemination of best practice and cooperation in transport logistics. The budget line should be maintained, but the threshold for individual projects may be too high. Not all successful dissemination practices require such a high budget. Also, they will not directly shift cargo, but focus on the long run.

Transport avoidance

The correlation between the other actions and this one is clearly seen: transport avoidance could be addressed in an integrated manner with shift practices. A critical issue in this respect is also empty running, regardless of modes, especially in peripheral zones. However, some doubts arise on the feasibility, since it requires administrative action on the one hand and collection of sensitive data on the other. Much will depend on a major public relations exercise to attempt to change attitudes. Others fear this is embedded in the market: by trends of outsourcing, the search for cheaper labour, and is not easily eradicated by a programme as Marco Polo II.

Contribution of the actions in general

These actions may very well contribute to the goals and help reach them, but a focus on the three original actions of Marco Polo I should be kept. The wider possibility of co-funding infrastructure is a good step forward. The focus should be not so much on innovation, but rather on making existing systems work.

Alternative actions

Intermodal promotion centres, a more extensive use of the success stories of PACT and Marco Polo I, national funding schemes, maybe e-learning on intermodality, all could be alternative actions to reach the goals of Marco Polo II.

7.5 Programme management

Suggestions on procedures

The project officers should get the liberty to judge contents of a project, instead of focusing on procedures. Delays in decision-making could ruin a project and should be avoided.

Funding mechanism

Start-up aids are a good mechanism to reduce the risk of new services and to break into new markets. Other instruments will neither contribute to share the risk between public and private organisations in the same way nor will they be an incentive to start innovative and capital intensive services in an alternative mode of transport. The budget may be higher to be more in line with the ambitious goals. Some funding of missing infrastructure that is vital to modal shift is considered appropriate, but the main focus

should be on helping the operating companies that bear the risks to engage in modal transfer.

7.6 Appreciation of the stakeholders' comments

It is the consultant's strong belief that the contributions of the stakeholders provide valuable input in the design of the new Marco Polo programme. Many remarks obviously make sense and are incorporated in the ex-ante evaluation, e.g. in the Section on programme management. Consultants would like to comment on the following aspects:

- *Complex application procedures*: if one is not familiar with submitting application forms, the procedure indeed might be difficult. However, a solid argumentation of the rationale and benefits of the proposed project is essential, if it were only to support a transparent project selection process. Moreover, comparing the application procedures of Marco Polo to other Commission initiatives, Marco Polo's procedure, consisting of a one-page sheet, a 10-page report and five annexes, seems reasonable.
- *Promotion of the programme*: indeed the first Call could have been promoted better. However, the first Call in October came very close after the start of the programme, leaving very little time (with little staff) to promote the programme. It is believed that the second Call will be better communicated. The following measures have been taken in this respect: an Info Day (prior to the second Call), a all-year available Help Desk, a Website, a Contact Point at each Member State and seminars in all countries. More on this issue in Section 12.2.2.
- *Infrastructure building within 18 months*: Marco Polo is designed to be a fast-track, market driven, service-oriented programme. The focus is on supporting services; infrastructure can be funded if this is supportive to the development of the services. If infrastructure can be developed quickly, the Marco Polo programme is in a position to fund the infrastructure. Extending the infrastructure building period would limit the fast-track character of the programme.

7.7 Conclusions

The stakeholders consulted are representatives from modal or sub-sector associations, representing a wider group of stakeholders. Most stakeholders were, generally speaking, appreciative of the Marco Polo II predecessors; PACT and Marco Polo I. Critical remarks regarding these programmes focus on (i) complex application procedures and low budget availability, impacting on success rate of proposals submitted, (ii) the tonne-kilometre reduction criterion and (iii) the formula used to calculate external benefits. Furthermore, Marco Polo, according to a number of stakeholders, could be better promoted in order to reach the beneficiaries.

Expectations of Marco Polo II are high. The six defined actions are expected to strongly contribute to the defined objectives. The infrastructure funding opportunity is welcomed. Innovation should not be the leading principle; instead making existing systems work should be the overriding aim.

8 Budget calculation

8.1 Introduction

The starting point for the budget calculation is the objective measured in tonne-kilometres as indicated in Section 3, focusing on objectives and indicators. In the period 2007-2013 the expected yearly aggregate increase of international road freight transport should be shifted off the road. For EU-25 the expected yearly increase is 20,5 billion tonne-kilometres on average, which makes it 144 billion tonne-kilometres for the whole period 2007-2013. For EU-25+ expected yearly increase is around 26 billion tonne-kilometres, respectively 184 billion tonne-kilometres for the 7 year period.

8.2 Calculation and assumptions

In the calculation of the Marco Polo II budget the following aspects play an important role and have a substantial influence on the outcomes:

1. Number of specific projects per action expected each year;
2. Number of expected tonne-kilometres shift per project;
3. Success rate of projects recommended for funding;
4. Subsidy per tonne-kilometres of shift;
5. Infrastructure cost per specific project;
6. Percentage of funding for infrastructure.

For each aspect a certain value is used to calculate the budget. We will give a further clarification of each aspect, by providing justifications on the values used for these calculations.

Number of specific projects per action

The total number of projects we expect to be submitted each year is 150 at maximum. Assuming a selection rate of around one-third, 50 projects at maximum might be recommended for funding. The share of Modal Shift Actions is expected to be high, because of the entry of 10 new Member States, which most likely will submit proposals for modal shift projects rather than proposals for complete new, highly innovative actions (i.e. Motorways of the Sea, rail synergy and traffic avoidance). Further to that the number of innovative services might be relatively low, because such projects involve higher risks (investments are higher because of necessary innovation) compared to projects which do not involve innovative aspects. Catalyst action projects will be rather stable, whereas Common Learning Action projects will increase compared to previous programmes. Table 8.1 presents the allocation of projects to action types and has been used as starting point for the budget calculations.

Table 8.1 Allocation of projects to actions

	Yearly number of projects	Short sea	Rail	Inland waterways	Combined transport	Road and others
Modal Shift	18	6	7	2	3	-
Catalyst	6	2	2	2		-
Common Learning	6	2	2	2	-	-
Motorways of the Sea	6	-	-	-	6	-
Rail Synergy	6	-	6	-	-	-
Traffic Avoidance	5	-	-	-	-	5
Total	47	10	17	6	9	5

Allocation of projects under the current action types (modal shift, catalyst, common learning) to modalities is based on information from the Marco Polo I, first call. For Motorways of the Sea combined transport by sea and inland waterways or rail is foreseen. Rail Synergy Actions aim to shift tonnes from road to rail. Traffic Avoidance does not focus on modal shift, however strives for less tonne-kilometres on the road. Typical projects are defined in more detail in Annex 8.

Number of expected tonne-kilometres shift per project

The expected number of tonne-kilometres of shift for the first three action types is based on the Marco Polo-Call 2003 and the minimum threshold that can be derived from the draft regulation for Marco Polo II, whereas the expected shift for the three new action types should at least be equal to the minimum threshold. More details on the expected tonne-kilometres of shift are presented in Annex 7.

Success rate of projects recommended for funding

For the success rate per action type a distinction is made between the relatively low-risk projects under the first three action types (modal shift, catalyst, common learning) and relatively high-risk projects under the three new action types (Motorways of the Sea, rail synergy, traffic avoidance). Experiences gained during the PACT and Marco Polo I programme enables the Commission to select projects from the first three actions, which are potentially (highly) successful. Therefore, success rate is assessed at 75% for modal shift, catalyst or common learning projects. Because such experience lacks for the three new action types, success rate is assessed to be lower, for Motorways of the Sea and Rail Synergy Actions around 50%¹³. For traffic avoidance a success rate of 60% is assumed, because this action type is more directly related to business objectives (increase business efficiency), and thus business' drive to make such projects successful will be of more influence on the success rate compared to other new actions.

¹³ Equal to overall success rate of the 65 PACT actions; Proposal for a Regulation of the European Parliament and the Council, Brussels 04.02.2002, page 5, point 9.

Subsidy per tonne-kilometres of shift

For each 500 tonne-kilometres of shift, an initial budget of 1 euro is necessary¹⁴. The first call of Marco Polo I achieved tonne-kilometres shift per euro that exceed the 500 ratio¹⁵. However, we think ratios from previous programmes might not be fully representative for the Marco Polo II objective. Saturation effects have to be taken into account. PACT and Marco Polo I were the start of the modal shift programmes, reflecting the easier shifts. For Marco Polo II it will be more difficult to attract projects with the same easy shifts. At the same time, Marco Polo II has broadened its scope, allowing for new type of projects. All in all, the 500 tonne-kilometres shift per euro is used as a basis for calculation, as indicated in Annex 7.

Infrastructure cost per specific project.

Four of the six action types (Catalyst, Motorways of the Sea, Rail Synergy, Traffic Avoidance) include preparatory measures and necessary infrastructure to achieve the objectives. To calculate the budget for funding the necessary transport infrastructure, typical projects have been defined that might be proposed under the Marco Polo II-programme. Annex 8 provides a detailed description and quantification of the necessary infrastructure for each typical project. Table 8.2 summarizes the infrastructure cost for the defined specific projects.

Table 8.2 Infrastructure costs per typical project (in million euro)

Action and specific projects	Infrastructure costs
Catalyst ¹⁶ :	
1. Rail Catalyst Action	7,6
2. Inland Waterway Catalyst Action	7,6
3. Short sea shipping Catalyst Action	7,6
Motorways of the Sea:	
1. New short sea terminal combined with rail (short sea shipping and rail)	15,5
2. New inland waterway terminal combined with short sea (short sea shipping and inland waterways)	7,6
3. Upgrading of existing port (short sea shipping and inland waterways/rail)	7,8
Rail Synergy:	
1. Upgrading rail infrastructure for freight service	10,4
2. Integrated freight-passenger	7,0
3. The last mile	2,0
Traffic Avoidance:	
1. New machinery for product modification	0,8
2. Relocation of distribution centre	2,7
3. Rearrangement of logistics chain	0,6

¹⁴ Amendment to the Regulation No 1382/2003 of the European Parliament and the Council, point 3, page 12.

¹⁵ The 2003 Call recorded a ratio of 914, however, this does not include the success rate of the projects. Total ratio, therefore, is expected to be reduced, as outlined in Section 6.5.

¹⁶ For Catalyst Actions no typical projects are defined. The project costs are assumed to be equal to the new inland waterway terminal combined with short sea, as defined in Motorways of the Sea.

Because Catalyst Action projects were not very successful in the first call of Marco Polo I, funding of necessary infrastructure in future catalyst projects under Marco Polo II is also foreseen. The amount of infrastructure investments necessary in catalyst projects is treated as equivalent to upgrading of existing port and terminal infrastructure or investment in new ports or terminals (see Motorways of the Sea).

8.3 Assessment of Marco Polo II budget

The assumptions described in the previous section lead to the assessment of the Marco Polo II budget for the EU-25, as presented in Table 8.3.

Table 8.3 Marco Polo II budget

Actions	Annual number of projects	Number of projects 2007-2013	Success rate of projects	tonne-kilometre-shift (billion)	tonne-kilometre-share	EC subsidy for services (mio EUR)	EC subsidy for infrastructure (mio EUR)	Total EC-subsidy cost (mio EUR)	Subsidy share
Modal Shift	18	126	75%	57.5	40%	153.3	-	153.3	19%
Catalyst	6	42	75%	23.6	16%	63.0	111.6	174.6	21%
Common Learning	6	42	75%	-	-	15.2	-	15.2	2%
Motorways of the Sea	6	42	50%	42.0	29%	168.0	151.4	319.4	39%
Rail Synergy	6	42	50%	10.5	7%	42.0	61.8	103.8	13%
Traffic Avoidance	5	35	60%	10.5	7%	35.0	18.9	53.9	7%
Total	47	329		144.1	100%	476.5	343.7	820.1	100%

Total EC-funding of the Marco Polo II programme is assessed at **820 million EUR** for the whole period, or **117 million EUR per year**.

Although the Marco Polo II programme is open to EFTA and EEA Member States, western Balkan countries, Belarus, Ukraine, Moldova, Russia and all countries on the Mediterranean and Black Seas, this will not have an effect on the Marco Polo II budget, as these countries can only participate on the basis of supplementary budget.

8.4 Sensitivity analysis

The yearly expected number of projects per action is probably the most uncertain factor in the budget calculation. Therefore this section quantifies what budget consequences occur if the number of specific projects per action type diverges from the one presented in

the previous section. Table 8.4 presents the division of projects to actions for the base case and the two alternatives presented hereafter.

Table 8.4 Results sensitivity analysis

Actions	Base case	Alternative 1	Alternative 2
Modal Shift	38%	20%	62%
Catalyst	13%	17%	19%
Common Learning	13%	13%	19%
Sub-total	64%	50%	100%
Motorways of the Sea	13%	17%	0%
Rail Synergy	13%	15%	0%
Traffic Avoidance	10%	18%	0%
Sub-total	36%	50%	0%

These assumptions lead to the following cost estimates in both alternatives for EU-25:

Table 8.5 Cost estimates alternatives

EU-25 Actions	Alternative 1				Alternative 2			
	tonne - kilome tre- shift (bio EUR))	EC subsidy services (mio EUR)	EC subsidy infra (mio EUR)	Total EC- subsidy (mio EUR)	tonne - kilometre -shift (billion)	EC subsidy services (mio EUR)	EC subsidy infrastruct. (mio EUR)	Total EC- subsidy (mio EUR)
Modal Shift	28.9	77.0	-	77.0	92.1	245.7	-	245.7
Catalyst	31.5	84.0	148.8	232.8	35.4	94.5	167.4	261.9
Common Learning	-	15.2	-	15.2	-	22.8	-	22.8
Motorways of the Sea	56.0	224.0	208.0	432.0	-	-	-	-
Rail Synergy	12.3	49.0	78.9	127.9	-	-	-	-
Traffic Avoidance	18.9	63.0	30.5	93.5	-	-	-	-
Total	147.5	512.2	466.2	978.4	127.5	363.0	186.0	530.4

Just as the base case, the objective of 144 billion tonne-kilometres of shift is within reach of Alternative 1. Costs of Alternative 1 are around 1 billion euro and significantly higher than costs of the base case (0.8 billion euro). On the one hand Alternative 1 foresees relatively more 'infrastructure' funding within projects, because share of projects under the new actions (Motorways of the Sea, rail synergy, traffic avoidance) is higher than in the Base case. On the other hand the success rate of such new projects is expected to be lower than projects under the current actions (modal shift, catalyst, common learning), so in terms of tonne-kilometres of shift, Alternative 1 is likely to result in a lower *tonne-*

kilometres / EUR-subsidy ratio, which makes it a rather expensive alternative compared to the Base Case.

Alternative 2, which to a certain extent (if infrastructure for catalyst projects is being excluded) could be compared with the current Marco Polo I programme, only foresees projects under the Modal Shift Actions, Catalyst Actions and Common Learning Actions. Because only infrastructure funds for catalyst projects can be requested, this alternative is cheaper, whereas the expected modal shift is still significant (approximately 88% of the tonne-kilometres objective). If the expected projects per year could be increased with 5 modal shift projects, the objective of 144 billion tonne-kilometres of shift could be achieved, with a total cost of around 575 million euro. However, this alternative seems far from realistic, because gaining such a large number of modal shift projects with a success of 75% seems impossible, knowing that Marco Polo I has already resulted in a large number of modal shift proposals. Because of this saturation effect, efforts and thus budget of gaining successful modal shift projects would dramatically increase (or success rate would dramatically decrease). Assuming that success rate would decrease to 50%, at least 53 modal shift projects and 12 catalyst projects per year (in stead of 34 projects respectively 9 projects in Alternative 2) would be necessary each year to achieve the tonne-kilometre objective, funding would accordingly rise to 0.8 billion euro, which is the same budget as estimated for the base case. The figures are presented in the next table.

Table 8.6 Costs per action

Actions	Number of projects 2007-2013	tonne - kilometre-shift (billion)	EC subsidy services (mio EUR)	EC subsidy infrastruct. (mio EUR)	Total EC-subsidy (mio EUR)
Modal Shift	53	113.1	452.2	0	452.2
Catalyst	12	31.5	126.0	223.2	349.2
Common Learning	9	0	22.8	0	22.8
Motorways of the Sea	0	0	0	0	0
Rail Synergy	0	0	0	0	0
Traffic Avoidance	0	0	0	0	0
Total	74	144.6	601.0	223.2	824.2

8.5 Conclusions

The objective in the Marco Polo II-period (2007-2013) is to shift the expected increase of international road freight transport measured in tonne -kilometres off the road. For the EU-25 this means a shift of 144 billion tonne -kilometres off the road to other transport modes or combinations.

Table 8.7 presents the Marco Polo II budget calculations.

Table 8.7 Marco Polo II budget calculation

Actions	tonne-kilometre		Costs			
	tonne-kilometre-shift (billion)	Share in objective	EC subsidy services (mio EUR)	EC subsidy infrastruct. (mio EUR)	Total EC-subsidy (mio EUR)	Share in costs
Modal Shift	57.5	40%	153.3	0	153.3	19%
Catalyst	23.6	16%	63.0	111.6	174.6	21%
Common Learning	-	-	15.2	0	15.2	2%
Motorways of the Sea	42.0	29%	168.0	151.4	319.4	39%
Rail Synergy	10.5	7%	42.0	61.8	103.8	13%
Traffic Avoidance	10.5	7%	35.0	18.9	53.9	7%
Total	144.1	100%	476.5	343.7	820.1	100%

Two alternative cases have been assessed; alternative one having a different distribution of projects over the six defined actions, emphasizing the three new defined actions and alternative two continuing the Marco Polo I programme, without including the three new defined actions. Comparing the base case and the two alternative cases, it can be concluded that the base case is the most balanced and therefore the most realistic approach to reach the targeted 144 billion tonne - kilometres shift.

9 Impact Assessment

9.1 Introduction

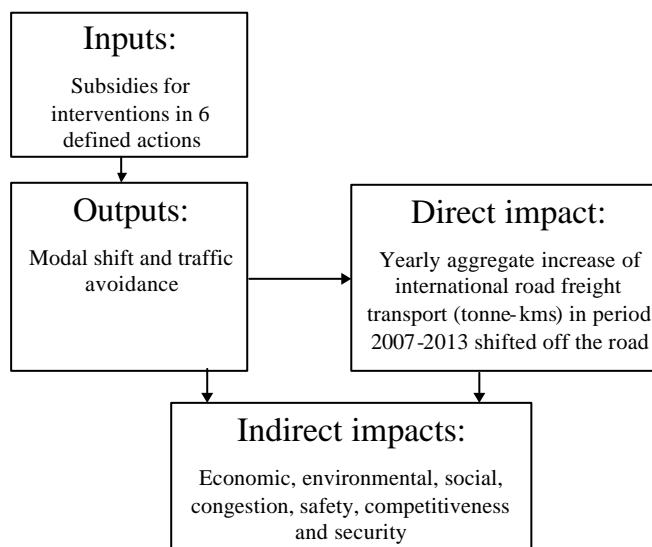
This section focuses on the impacts of the Marco Polo II programme. The following steps are applied (i) identification of the *type* of expected impacts, (ii) identification of the *level* of expected impacts and (iii) identification of *distributive effects* of expected impacts. The results of analysing the impacts will, together with Marco Polo II cost estimates, feed into the cost effectiveness analysis, as presented in Section 10, providing insight in the extent to which Marco Polo II provides value for money.

9.2 Type of impacts

Direct and indirect impacts

In the impact assessment a distinction is made between direct and indirect impacts. According to the handbook for impact assessment¹⁷ *direct impacts* are impacts that are directly related to the programme objectives, i.e. the shift of at least the aggregated increase in international road freight traffic, measured in tonne-kilometres and resulting from measures taken in the programme. All other impacts are *indirect impacts*. These impacts are defined in a number of areas, i.e. economic, environmental, social, competitiveness and crime and terrorism impact. Figure 9.1 presents a graphical illustration.

Figure 9.1 Direct and indirect impacts



¹⁷ A Handbook for Impact Assessment in the Commission-How to do an Impact Assessment.

9.2.1 Direct impacts

The direct impact, the shift of at least the aggregated increase in international road freight traffic, measured in tonne-kilometres, is estimated for all six actions as indicated in chapter 7. The following direct impacts are estimated for the six defined actions.

Table 9.1 Direct impact of six defined Marco Polo II actions (billion tonne-kilometres)

Action	Shifted to	Total modal shift
Modal Shift	Rail	26.0
	Short Sea Shipping	22.1
	Rail-Inland Waterways-Short Sea	9.5
	<i>Sub-total</i>	<i>78.8</i>
Catalyst action	Rail	7.9
	Inland Waterways	7.9
	Short Sea Shipping	7.9
	<i>Sub-total</i>	<i>23.7</i>
Common Learning	Not applicable	-
Motorways of the Sea	Short Sea Shipping – Rail	14.0
	Short Sea Shipping – Inland Waterways	14.0
	Short Sea Shipping – Inland	14.0
	Waterways/Rail	
<i>Sub-total</i>	<i>42.0</i>	
Rail Synergy	Rail	10.5
Traffic Avoidance	Not applicable	10.5*

* For Traffic Avoidance the figure represents road tonne-kilometres saved due to increased efficiency (e.g. higher load factors) and transport avoidance (e.g. less links in the logical chain).

Based on Table 9.1 it can be concluded that the Modal Shift Action contributes the most of all actions to the shift of tonne-kilometres, followed by the Motorways of the Sea. More details on how this impact is built up is provided in Annex 10.

9.2.2 Indirect impacts

The following indirect impacts are addressed:

- Externalities, i.e. air pollution, global warming, noise, traffic safety (accidents), congestion, infrastructure¹⁸;
- Economic;
- Social;
- Competitiveness;
- Crime and terrorism.

Of these, air pollution, global warming, noise, traffic safety, congestion and infrastructure impacts are quantified using marginal costs estimates from former DG TREN research (UNITE, RECORDIT, REALISE) and other sources (INFRAS/IWW, OECD). The other types of impacts are assessed on a qualitative level.

¹⁸ Strictly speaking, marginal infrastructure costs (cost to infrastructure managers of additional traffic using it, principally maintenance and renewal).

Quantification of impacts

The impacts are defined as the difference between the reference situation (without Marco Polo II) and the situation in 2013 with Marco Polo II. For each of the six actions of Marco Polo II, the expected tonne-kilometres (TKM) shift off the road has been estimated (see chapter 7). These TKMs are either shifted to other modes (rail, inland waterways, short sea shipping) or through avoidance of transport. In order to assess the external and safety impacts the following methodology is applied:

1. Define the total road TKM shifted to rail, inland waterways, short sea shipping and avoidance (per action separately).
2. Calculate the total externality costs for the road TKM by multiplying with the marginal cost estimate per TKM.
3. Calculate the total externality costs for the TKM shifted to rail, inland waterways, short sea shipping by multiplying with the respective marginal cost estimate per TKM.
4. Calculate [2] – [3]

The purpose of the impact assessment is to compare the six actions. The calculations provide the input for the assessment. It should be noted that preferably the calculations should be used for ranking only, since some previsions on transferability and other assumptions are needed. In Annex 10 an overview of the calculation method applied is provided including all assumptions. In order to have consistency with previous calculations, the values used for the marginal cost estimates are the same as used by DG TREN for their calculation of external costs for the first Marco Polo Call for proposals.

It should be noted that the external impacts are not restricted to the period 2007-2013: the impacts are also valid beyond the year 2013. Therefore the calculated impacts represent the **minimum value**, the actual impacts are higher. A second note is made on the new infrastructure and its residual value in 2013. In order to address both the impacts beyond 2013 and the residual value of the infrastructure, a socio-economic cost-benefit analysis (CBA) should be carried out for a period of 25-30 years¹⁹. However, such a CBA is not made for this impact assessment, since detailed information on project level is not available.

Table 9.2 presents the external benefits of the different actions expressed in billion euro.

¹⁹ Depending on the type of project. Reference is made to the "Guide to Cost Benefit Analysis of investment projects" prepared for the Evaluation Unit of DG Regional Policy

Table 9.2 Indicative external benefits in billion euro

Action	External Impacts						Total
	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	
Modal Shift	0.22	0.02	0.14	0.21	1.30	0.04	1.92
Catalyst action	0.08	0.03	0.06	0.09	0.54	0.02	0.81
Common Learning	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motorways of the Sea	0.14	0.08	0.11	0.15	0.95	0.03	1.46
Rail Synergy	0.05	-0.02 ²⁰	0.02	0.03	0.24	0.01	0.32
Traffic Avoidance	0.09	0.03	0.03	0.05	0.24	0.05	0.48
Total	0.58	0.12	0.35	0.52	3.26	0.14	4.98

Based on Table 9.2 the following can be concluded:

- Modal Shift action represents the highest benefits of all actions. The Motorways of the Sea provide the second highest impact²¹.
- The congestion benefits represent around 65% of all quantified benefits. It should be noted that congestion is highly time- and location specific, which is not covered in the calculation. Therefore it is recommended to assess the congestion impacts on a project level, rather than on a programme level.
- If the Marco Polo II programme is not carried out, the total monetary value of externalities of the growth in international road freight transport equal 6.57 billion, compared to 1.59 billion in the case of the Marco Polo II programme (the difference is 4.98 billion euro as presented in the table above). Therefore the reduction in externalities of the Marco Polo II programme for the growth of international road freight transport in the period 2007-2013 is approximately 76%²².

A sensitivity analysis on the calculation of the external benefits is carried out. In this analysis the average load factors are downscaled and an adjustment is made for the distribution of international road traffic over urban and interurban areas (details see Annex 10, section on sensitivity analysis). As a result the monetary value for external benefit is estimated at 6.99 billion euro. In order to be able to compare the calculated values with previous programmes, the value of 4.98 billion euro will be the leading indicator.

Economic impacts

In relation to economic activities the following key points are presented as positive impacts from the Marco Polo II initiatives:

- Reduced mono-modal transport dependency.
- Energy efficiency gains and reduced excessive reliance on liquid hydrocarbon fuels for freight transport.

²⁰ The negative impact for global warming is a consequence of the marginal cost estimates used as provided by DG TREN: 0.0026 euro/tonne-kilometre for road and 0.0046 euro/tonne-kilometre for rail. An appreciation of these figures led to some modifications of values. This resulted into a sensitivity analysis, which is presented in Annex 10.

²¹ This coincides with the impact in terms of tonne-kilometres shifted of these two actions.

²² See Annex 10 for more detailed calculations.

- New market options and commercial market stimulation/innovation to support more diverse inter-modal services and service structures.
- Avoidance or deferral of road infrastructure investment.
- Reduced congestion for remaining freight and passenger traffic.
- De-coupling of transport growth from economic development.

Possible negative economic impacts could include:

- Risk of loss of EU economic growth during the transition from mono-modal to multi-modal options.
- Negative impact on road transport manufacturing base and supporting sectors (see also section below on social impacts).

Social impacts

Social impacts of Marco Polo II are assessed by making reference to defined EU policy in the following fields:

- *EU Strategy for Sustainable Development*²³: this strategy identifies 6 main threats to sustainable development of which the following could be relevant for Marco Polo II; (i) the ageing of population, threatening the European social model and (ii) the increasing socio-economic polarisation between regions (cohesion)²⁴. Marco Polo II is not expected to impact ageing and related aspects. Given the international and multi-Member State character of the programme, Marco Polo is expected to contribute to increased cohesion within the EU.
- *Lisbon, Nice and Stockholm summits, major objectives of the Community policies*: employment targets. More on employment is provided below.

As for all other impacts, it should be noted that Marco Polo II is geared towards shifting future growth in road traffic off the road. It therefore, has an impact on future growth opportunities, more than affecting the current size of the sub-sectors. Employment impact of Marco Polo II can be divided in impacts through *modal shift* and *traffic avoidance*.

In *Modal Shift Actions*, the majority of Marco Polo II, a substitution effect is foreseen from the road sector to alternative modes of transport. This goes for both the direct employment effect, relating to the people directly involved in freight transport, and the indirect employment effect, relating to supporting services, i.e. truck building industries or manufacturers of rolling stock. There is a range of effects working in opposite directions and the net effect is unknown; a targeted in-depth study would be required to determine the total effect. Effects are outlined in Table 9.3.

²³ See COM (2001) 264.

²⁴ According to *Analysing the Social Impacts of the Commission's Initiatives*, EU Employment and Social Affairs, October 2002.

Table 9.3 Employment impact of Marco Polo II

	Negative employment effect	Positive employment effect	Net effect
Mode of transport	Road	Rail, inland waterways, short sea shipping	
Direct effect	A reduction of staff involved in international road haulage (planners, drivers, etc)	An increase in staff involved in international freight transport (drivers, engineers, vessel crew, etc)	Effects going in opposite directions; net effect unknown and depending on productivity per sub-sector (employment/tom-km). Marco Polo may impact employment on a regional basis, providing benefits to regions with a strong intermodal focus and not benefiting strong international road haulage regions. To reduce staff in road transport in which there is a tendency to use truck drivers from non EU Member States and to substitute these with mostly EU Member States based staff involved in alternative modes of transport may have a positive overall effect on employment.
Indirect effect	A reduction in employment in supporting industries , e.g. truck producers	An increase in employment in supporting industries , e.g. producers of rolling stock, shipyards	Determining factors are (i) productivity per sub-sector and (ii) location of industry (in or outside EU). Assuming that both truck producers and producers of rolling stock and shipyards are located within the EU and productivity is comparable, again the net effect is unknown. The location of the industries impacts the regional employment effects.

Traffic avoidance, through its direct reduction in tonne-kilometres in international road transport, is expected to result in a decrease in direct employment (staff involved in international road haulage, e.g. drivers) and indirect employment, i.e. the supporting industries. On a temporary basis, Traffic Avoidance Actions, e.g. relocation of distribution centres, will create job opportunities. Given the size of the Traffic Avoidance Actions (7 per cent contribution in total tonne-kilometres reduction, see Section 8), the total size of the employment effect is expected to be relatively small.

Other social impacts of the Marco Polo II programme are the following:

- Reduced physical and social divisiveness and access to services resulting from excessive road freight transport in urban areas.
- Reduced traffic accident risks from road based freight activities in sensitive or vulnerable areas (proximity to schools, play areas etc).
- Creation and delivery of training and education needs for new inter-modal transport skills.
- Opportunities for skill transfer, creation of new skills and support services in EU-25.

Competitiveness

The competitiveness analysis is becoming a regular element in impact assessment in order to ensure that new programmes or regulation are consistent with the Lisbon objective.

A competitiveness scan has been conducted. Based on this scan the likely negative impact on competitiveness of Marco Polo II is limited to:

- Some rather low compliance costs and administrative burdens through the tendering and monitoring and evaluation process.
- Impact on employment in the international road freight sector through a reduced growth in international road freight traffic. This, however, could be counterbalanced by a growth in employment in alternative modes of transport (rail, inland waterways, short sea).
- Impact on regions or countries in case of regions or countries with strongly developed road haulage sector and relatively poorly developed alternative modes of transport.

Furthermore, the Marco Polo II programme provides a number of possible positive impacts on competitiveness, i.e.:

- Lowering transportation costs, having a positive impact on production costs and positive spill-over effects to other sectors.
- Contributing to innovation within the transportation sector.
- Contribution to development of the internal market through the international character of the programme.

The above results in a green light score on the traffic light test. A more comprehensive assessment through a competitiveness test²⁵ is therefore not deemed essential.

Crime and terrorism

International freight transport, the focal area of the Marco Polo programme, is not free from criminal activities, making crime and terrorism serious aspects in relation to the development of the new programme. An additional reason to do so is the enlarged EU (since May 2004), resulting in EU Member States directly bordering to Russia and other CIS countries, which have higher risk profiles in terms of criminal activities and terrorism.

It should, however, be noted that Marco Polo II is focused on shifting future growth in international road traffic off the road, for the vast majority to be replaced by alternative modes of transport, i.e. rail, inland waterways and short sea shipping. Therefore, the question is more on how these alternative modes compare to road transport in terms of crime and terrorism. On the one some sub-sectors, notably short sea shipping, is vulnerable to trafficking. On the other hand, the more rigid nature of these alternative modes of transport, with fixed nodes (rail stations, ports), provides opportunities for better controlling movement of freight flows. It is therefore recommended that projects under Marco Polo II should incorporate crime-preventing measures, e.g. fencing, scanning devices, etc in project design, minimising risks related to crime and terrorism.

²⁵ See Outline of a proposed competitiveness test in Impact Assessment, European Commission, March 2004.

9.3 Conclusions

This section presents conclusions based on the impacts assessed in the previous sections and focusing on the way the effects are distributed over stakeholders involved and society as a whole.

Direct beneficiaries: rail, inland waterways and short sea

The direct beneficiaries are service providers in the alternative modes of transport. As indicated in previous sections, these service providers are expected to benefit economically through market opportunities created through Marco Polo II, positively impacting job opportunities. Supporting industries may profit consequently. The actions modal shift and Motorways of the Sea are expected to result in most tonne-kilometre reductions, providing a strong basis for notably short sea shipping and rail.

The location of the impact is determined by the location of the Marco Polo II funded projects and supporting industries.

Road sector

The opposite story regarding expected social impacts for the direct beneficiaries can be told for the road sector. A total volume of approximately 144 billion tonne-kilometres shifted off the road in the period 2007-2013 would negatively affect the road haulage sector and its supporting industries in terms of economic performance and job opportunities.

Society as a whole

The Marco Polo II programme is designed to reduce negative externalities of road transport, affecting society as a whole. Section 9.2.2 indicates that Marco Polo II is successful in reducing negative effects in air pollution, global warming, noise, traffic safety (accidents), congestion and infrastructure use. The total value related to this is estimated at approximately 5 billion euro.

10 Cost-effectiveness

10.1 Introduction

The cost effectiveness analysis relates the effects of the Marco Polo II programme to the total costs needed to produce the effects. The inputs from chapters 8 on budget calculations and 9 on impact assessment are used as input. Costs used in cost effectiveness calculations are the total EC subsidy for projects; programme management costs and costs borne by the contractors are not included.

The indicators obtained from the analysis on Marco Polo II level are compared to preceding programmes in order to judge the cost effectiveness. An assessment of the cost effectiveness of the different actions within the programme is also carried out.

10.2 Cost-effectiveness compared to other programmes

In the Impact Assessment a distinction is made in direct and indirect impacts. The direct impacts refer to the number of tonne-kilometres shifted off the road. Together with the total EC subsidy needed for this modal shift, the *tonne-kilometres shift per euro EC subsidy* is calculated.

The external impacts are also quantified and if divided by the total EC subsidy, the *external benefits per euro EC subsidy* is determined, which is the second cost effectiveness indicator used.

Marco Polo II is compared to PACT and Marco Polo, as assessed in chapter 6. Table 10.1 presents the results.

Table 10.1 Cost effectiveness indicators Marco Polo II compared to Marco Polo I and PACT

	EC subsidy request (million euro)	Modal Shift (billion tonne-kilometre)	External benefits (billion euro)	tonne - kilometre shift / euro	External benefits / euro
Marco Polo II	820.1	144.1	4.98	176	6.07
PACT	30	11	-	367	± 15***
Marco Polo I	14.94*	13.65 (6.83)**	-	457**	± 15***

* Only the first call 2003 taken into account.

** A success rate of 50% is applied, reducing the modal shift from 13.65 to 6.83).

*** These programmes have indicated ratios of some 1:15.

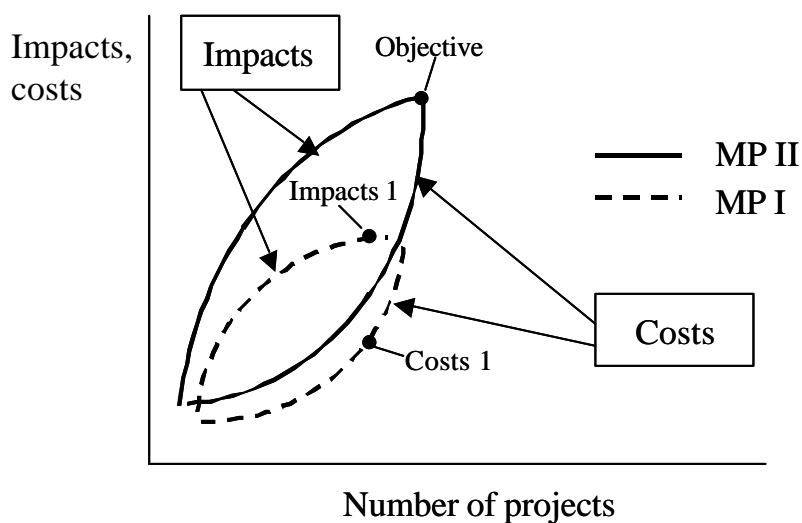
Table 10.1 shows that the tonne-kilometres shift per euro of Marco Polo II is lower than PACT and Marco Polo I. The tonne-kilometres shift per euro of Marco Polo II and external benefits per euro are lower than in previous programmes, because:

- *Costs* of Marco Polo II as compared to its predecessors, are at a substantial higher level, as infrastructure funding is included for the majority of the defined actions. In order to achieve the objectives, with relatively less attractive projects, as compared to the first projects of Marco Polo I, investing in infrastructure to support the enhancement of intermodal services is essential. This is reflected in the three new actions, while infrastructure funding in Catalyst Actions is also permitted.
- The *marginal revenues of tonne-kilometres shift* are reduced with the programme expansion through the principle of ‘most attractive project selected first’. This especially applies to the ‘old’ actions; the new actions provide potential for tonne-kilometre reductions, but are simply more expensive, as infrastructure funding is included.

It should be noted that in this cost effectiveness calculation the benefits beyond 2013 and the residual value of the infrastructure are not taken into account. If corrected for these aspects, the actual cost effectiveness is expected to be higher than the values presented.

The essential point here is that the objective of shifting the growth in international road freight transport off the road, could not be achieved by continuation of Marco Polo I, as under the ‘old’ programme, based on three actions, an insufficient number of feasible projects would be available. Marco Polo II, with its expansion in new actions that include infrastructure funding and upgrading Catalyst Actions by allowing infrastructure funding to be included, will result into significant higher overall impacts, whereas the costs increase substantially as well. This is however justified, as otherwise the objectives in terms of tonne-kilometre shift, could not be reached. Figure 10.1 represents the above statements.

Figure 10.1 Relationship between number of projects and their costs and impacts



The figure represents the relationship between the number of projects and their costs and impacts. The more projects are carried out, the higher the total impacts, although the marginal contribution per project decreases.

At present the indicative costs and impacts of Marco Polo I are illustrated by ‘Costs 1’ and ‘Impacts 1’. The maximum total impact is not achieved yet; in order to achieve this an increase in the number of projects is needed. However the marginal costs of these projects are higher than the previous ones. More important, the objective to shift the growth in international road freight transport growth off the road in the period 2007-2013 could not be achieved by continuation of Marco Polo I.

The alternative for continuation of Marco Polo I is the foreseen expansion with three new actions (Marco Polo II), together with a geographical expansion. This will result into significant higher impacts, whereas the costs increase substantially as well. This is justified because otherwise the objectives could not be reached.

10.3 Cost-effectiveness of actions within Marco Polo II

On an action level the cost effectiveness indicators are calculated, which are presented in Table 10.2.

Table 10.2 Cost effectiveness indicators of the different actions within Marco Polo II

	EC subsidy request (million euro)	Modal Shift (billion tonne - kilometre)	External benefits (billion euro)	tonne - kilometre shift / euro	External benefits / euro
Modal Shift	153.3	57.5	1.92	375	12.51
Catalyst	174.6	23.6	0.81	135	4.63
Common Learning	15.2	-	-	-	-
Motorways of the Sea	319.4	42.0	1.46	132	4.56
Rail Synergy	103.8	10.5	0.32	101	3.07
Traffic Avoidance	53.9	10.5	0.48	195	8.87
Total	820.1	144.1	4.98	176	6.07

In terms of *tonne-kilometres shift per euro EC subsidy* (direct impact) the Modal Shift action provide the best value for money. The value for the Modal Shift action of 375 tonne-kilometre per euro is more than twice the value of the overall programme. If compared to PACT and Marco Polo I this value is also more in line. The Traffic Avoidance Action is second in place.

In terms of *external benefits per euro EC subsidy* (indirect impact) the results per action are the same as for the previous indicator. Each euro spent in the Modal Shift action, provides an external benefit to the European Union of 12.59 euro. This ratio is 8.87 for the Traffic Avoidance Action.

10.4 Conclusions

Marco Polo II provides value for money, although the programme is less cost-effective as compared to previous programmes

The cost effectiveness in terms of tonne-kilometres shifted per euro of the Marco Polo II programme is lower than the previous PACT programme and the first call of Marco Polo I. The most important reason is that costly infrastructure funding is included for selected actions. This is needed in order to achieve the objectives, which cannot be achieved by continuation of the present Marco Polo I programme due to the principle of ‘most attractive project selected first’ (saturation effect).

Modal Shift action provides highest value for money of all actions

The Modal Shift action within Marco Polo II provides the best value for money of all actions both in terms of tonne-kilometres shift per euro EC subsidy (375) and in terms of external benefits per euro EC subsidy (12.51). The Traffic Avoidance action is the second best action, Motorways of the Sea and the Catalysts action provide almost the same scores (third and fourth place) and the Rail Synergy action provides the lowest scores on cost effectiveness although the difference with Motorways of the Sea and Catalyst action is small.

11 Planning future monitoring and evaluation

11.1 Introduction

Goals of monitoring and evaluation

Monitoring and evaluation of the actions are important aspects of the Marco Polo II programme, given its concentration on the short-term impact of the various types of actions. To measure impact reliable data has to be collected from the start of the actions regarding implementation of the actions and their immediate results. Because the financial contribution from the Commission is for most types of actions set in relation to their expected impact, the basis for the monitoring and evaluation is laid in the application stage.

Monitoring is required to check progress of actions, follow their inputs and outputs and identify whether action is needed and taken to achieve full implementation of the action.

The main goals of monitoring activities for Marco Polo are to:

- Follow progress of actions during their implementation, in relation to the original time schedule, inputs and scope.
- Assess whether actions are indeed generating the identified output and results.
- Identify whether actions are required, and taken, to achieve full implementation of the action.

The monitoring information can form the basis for the annual report on financial execution of the programme and status of all actions under the programme.

Evaluation is a legal requirement. Evaluation reports of the Marco Polo II programme shall be presented to the European Parliament, the Council, The European Economic and Social Committee and the Committee of the Regions. The main aspects of such an evaluation shall be efficiency, effectiveness and impact of the programme. Also the innovativeness of the programme and dissemination of its results will be part of the evaluation task.

Evaluation is further used to give feedback on the programme and draw lessons for the future. Specific aims of the evaluation of actions are to:

- Report on the implementation of the action in relation to the original scope, timing and inputs used.
- Report on the output of the action, for instance in terms of the identified transport service.
- Report on the result of the action, in terms of the identified result indicator (i.e. tonne-kilometres shifted off the road, reduction in tonne or vehicle-kilometres).
- Analyse the effectiveness and efficiency of the project in reaching the objectives.

- Check whether the other requirements have been fulfilled, such as innovation character of the action and dissemination of the results.
- Give feedback to the programme management in terms of lessons learned, best practices and/or amendments to the programme rules.

In the monitoring and evaluation of Marco Polo II, a balance is to be struck between the (legal) need for monitoring and evaluation on the one hand, and the requirements for applicants on the other hand, knowing the maximum size of the subsidy that can be expected. This means that the monitoring and evaluation tools should provide the necessary information at the desired level and with the desired speed, while not being too cumbersome nor lead to high administrative costs for the applicants.

11.2 Monitoring in Marco Polo II

Monitoring of Marco Polo II is to be carried out on the basis of interim reports. In addition a Mid-Term Evaluation Visit by the programme management is foreseen.

Progress reports

The *Progress Reports* are to be written according to a fixed structure and to be submitted *every six months* by the contractor, starting with the date of signing of the subsidy contract between the contractor and the Commission.

The Progress Reports should be concise and contain the main elements required for monitoring. It should thus provide the basic information on implementation of the action and expected impacts and results. For the reports a standard set of indicators is to be used which will include among others:

1. Degree of progress of the action in relation to planned scope, timing and inputs.
2. Expected output of the action.
3. Expected result of the action in terms of the objectives of the Marco Polo II programme (e.g. shift in tonne-kilometres from road to other modes, reduction in tonne-kilometres, damage to the environment, etc).

On top of the crucial monitoring information, the interim reports should describe more general aspects of the project, such as:

1. Activities carried out in implementing the action during the reporting period.
2. Difficulties encountered in implementation and action taken.
3. External factors influencing the potential impact of the action, potential risks.

Mid-term monitoring visit

These formal Progress Reports are to be supplemented with a formal visit by the programme management. The aim of such a *Mid-Term Monitoring visit* is to confirm and validate the information provided by the contractor in the Application and the Progress Reports, in particular with respect to outputs and impacts. In addition, the visit can ensure that the programme management has intimate knowledge of the project. Further, during these visits, feedback can be acquired on specific issues (risks, external factors; innovation), which can be used to improve project selection and management of the programme.

Project completion report

A next step in the monitoring process is the submission of the *Project Completion Report* within one month of completion of the action and/or initiation of the transport service (the earliest of the two times). The Project Completion Report should contain updated information on similar issues like being handled in the Progress Reports:

1. The degree of completion of the action in relation to planned scope, timing and inputs.
2. The realised output of the action in relation to the expected output.
3. The expected result of the action in terms of the objectives of the Marco Polo II programme (e.g. shift in tonne-kilometres from road to other modes, reduction in tonne-kilometres, damage to the environment, etc).

It should also demonstrate the innovative character of the action (if applicable) and the actions foreseen in the field of dissemination. Further, the project completion report should contain a short review of the:

1. Difficulties encountered in implementation and action taken.
2. External factors influencing the potential impact of the action, potential risks.
3. Financial viability of the service.

Additional progress report

However, the monitoring does not end with the Project Completion Report. Given the objectives of Marco Polo II to realise a lasting reduction in road congestion and tonne-kilometres moved on the EU road network, it is quite important that monitoring is continued some time after the completion of the action. Therefore, during the three years after the completion of the action annual *Additional Progress Reports* are to be submitted by the Contractor. Such Progress Reports are expected after 12, 24 and 36 months after completion of the action. The aim of these Additional Progress Reports is to verify the expected impact of the action, as well as of dissemination activities and viability of the service.

The results from the interim reports, completion report and progress reports are to be fed into database, kept by the programme management, which tracks the following main indicators:

1. Rate of completion as compared to original plan (in time, in money terms).
2. Original and realized financial budget of the action.
3. Result of the action in terms of the specified output indicators.
4. Utilization of the services in relation to their capacity and in relation to the original plan.
5. Financial key ratios, like revenues/expenditures of the service.

The database can be used to assess key ratios for the programme, such as:

1. Shift or reduction in freight tonne-kilometres per euro of subsidy.
2. Cost of subsidy per tonne of carbon dioxide avoided (or other externalities).

11.3 Evaluation

Two types of evaluations are to be carried out, a *mid-term evaluation* and an *ex post evaluation*.

The mid-term evaluation is to be carried out in 2010. Its aim is to review the functioning of the programme and the quality of the actions. It should cover issues such as the efficiency, effectiveness and impact of the projects. It should give insight in the relevance of the various types of actions foreseen and draw conclusions on application and selection procedures, selection and co-financing criteria and the financing thresholds. The mid-term evaluation should shed light on the contribution of the various types of actions towards the goals of the Marco Polo II programme. Its conclusions could lead to adjustments in procedures and budget allocations.

The ex post evaluation of the Marco Polo II programme is important in the light of accountability towards the Council and Parliament. The aim of the evaluation is review the whole process of actions, from application until finalisation of the projects, as well as to review the Marco Polo II programme in its entirety. It will enable the drawing of lessons with a view to future (similar) programmes. In the ex post evaluation the effectiveness, efficiency and impact of the programme is to be reviewed, as well as issues regarding Community Value Added (dissemination, innovativeness).

Both the mid-term and ex post evaluation of the Marco Polo II programme are to be carried out by independent outsiders. This is needed to ensure an objective judgement on the mentioned issues.

11.4 Conclusions

In monitoring of the Marco Polo II programme a balance is to be struck between the need for monitoring information and the administrative requirements for applicants, knowing the maximum size of the subsidy that can be expected.

The following formal instruments are proposed:

- **Progress Reports (twice a year) during the implementation of the action, focusing on efficiency and effectiveness of implementation.**
- **A Project Completion Report upon finalization of the action.**
- **Annual Additional Progress Reports focusing on the impact of the transport services in particular in terms of the main indicators (e.g. shift in tonne - kilometres from the road, reduction in road tonne -kilometres), during three years after completion of the action/inauguration of the service.**

These reports are to be submitted by the applicants to the programme management of Marco Polo II. The reports will have a standard format including a standard set of monitoring indicators, which facilitates storing the results in a database kept by the programme management. The reports will of course be supplemented by regular contact between the projects and the programme management.

In addition to the reports, two evaluations are proposed, both to be carried out by independent outsiders:

- **A *Mid Term Evaluation* during the Marco Polo II programme, focusing on the functioning of the programme and the quality of the actions. Its conclusions should enable possibly needed minor amendments to the selection of projects and balancing between types of actions.**
- **An *Ex Post Evaluation* specifically aimed at evaluation of the effectiveness, efficiency and impact of the action, as well as aspects of Community Added Value (innovativeness of the action, dissemination activities).**

12 Programme management

12.1 Management structure

12.1.1 Human resources

Size of programme management

Three persons (officials, without secretariat) currently carry out Marco Polo programme management, providing a rather small basis for this relatively large programme.

Programme management activities can be summarised in three main clusters, as done in the PACT evaluation²⁶: (i) project selection, including preparation of the call for proposals and contract negotiation (ii) project monitoring and (ii) dissemination and awareness-raising. Given the expected broadened future scope of the programme, both in terms of size (increase in the number of projects, size of budget) and complexity (new Member States, new action types), an increase in the Marco Polo workload is anticipated and allocating additional staff to the programme is deemed necessary. A staff level of 12-14 persons (officials, without secretariat) seems in line with expected workload, also taking into consideration that Marco Polo management needs to pay due attention to public relations (see section on public relations below). Table 12.1 presents a global calculation to establish the staff size.

Table 12.1 Calculation of staff size Marco Polo II programme management (officials, without secretariat)

Component	Size in days/year (number of staff ²⁷)	remarks
Project selection	800-900 (4,0-4,5)	See second bullet below table
Project monitoring and evaluation	1.400-1.600 (7,0-8,0)	See third bullet below table
Others, including dissemination and awareness raising	200-300 (1,0-1,5)	See fourth bullet below table
Total	2.400-2.800 (12,0-14,0)	

Table 12.1 is based on the following assumptions:

- The average project duration of a Marco Polo II project is 3,36 years (weighted average of project duration of the five defined actions). Based on 47 projects per call (per year), the total number of projects in the normalised situation is 158 projects.
- The days spent on monitoring in the PACT programme is 5,2 days per project per year. Based on the 158 projects as defined above, this results in some 820 days per year in project selection for Marco Polo II.

²⁶ Evaluation of the Implementation of Council Regulation 2196/98 (PACT), AEA Technology Environment, 2000.

²⁷ Number of staff is calculated based on an average 200 working days per year.

- The ratio between project selection and project monitoring in PACT is 1:1,71 (See PACT evaluation²⁸). This results in some 1.400-1.600 days per year for monitoring and evaluation in Marco Polo II.
- Some 10 per cent of time is estimated to be needed for other programme management issues, i.e. dissemination and awareness raising, resulting in some 200-300 hours per year for Marco Polo II.
- Total time calculated for project selection and monitoring and evaluation (on average 2350 days per year) and a calculated number of projects of 158, results in a span of control of 14,9 projects per person. This is considered on the high side, yet still manageable in an efficient operating team.

Outsourcing

Staff employed by the Commission is to be preferred, given the confidential character of most of the programme management activities. At the same time, efficiency gains can be realised if Marco Polo staff follow projects from inception (proposals) to completion (completion report-additional progress report, see Section 10.2). Marco Polo staff will act as account managers for a range of projects (maximum of 15 projects, as indicated above). If activities are outsourced, additional transfer costs are to be expected. Still, some activities can be outsourced, e.g. ex post evaluation, however, this is expected to be a relatively small amount of work.

12.1.2 Member States' representation

Member States are represented through a Management Committee. This committee, meeting each year, in which all 25 Member States are represented, is responsible for:

- Placing political priorities in the calls, e.g. in the first call of Marco Polo I political priorities within Catalyst Actions emphasized certain type of projects.
- Checking the selection procedures followed and whether the shortlists are established properly.

The Management Committee does not have any decisive authority over project selection; this is contrary to the so-called Regulatory Committee, in which the Member States do have a say in project selection. The Regulatory Committee model is considered inappropriate for Marco Polo management, as it would slow down processes too much, preventing a timely delivery of programme objectives.

For Marco Polo II management a continuation of the Management Committee structure is recommended, with annual meetings looking forward to placing political priorities in the next call and looking back at the last call's procedures.

²⁸ In the PACT evaluation 252 days/year are allocated to project selection and 147 days/year to project monitoring.

12.2 Managerial aspects

12.2.1 Selection procedure

Submitting and selecting projects is a demanding and time consuming task, both from the Commission's point of view, and from the applicants' point of view. There are pressures to keep the selection procedures simple in order to attract a sufficient amount of proposals from the market. At the same time, selection criteria should ensure high quality projects and should be applied in such a way that the process is transparent and eliminating cases of fraud. The challenge is to balance both elements and to develop a sound and robust evaluation system. Marco Polo management has attempted to minimise the administrative burden by requesting a relatively simple application package, i.e. a one-page form, with a ten-page main text and a total of five annexes, including a map of diverted traffic, a business plan, letters of interest and CVs of leading managers. Especially, in comparison to other Commission initiatives, this can be considered a rather robust application procedure.

Although a certain spread of projects over the six defined actions is considered desirable, if only to accommodate the various modalities. A target for dividing the projects over the six defined actions is not considered feasible, as it would take away flexibility in selecting an optimal package of projects. In the annual meetings of the Management Committee, certain priorities regarding the six actions can be agreed upon.

Eligibility criteria

In the first call of Marco Polo I, the following eligibility criteria were included, providing the basis for Marco Polo II eligibility:

- *Eligible type of legal entity*: commercial undertakings only.
- *Eligible to participate in a project consortium, if entity situated in*: (i) EU Member States, (ii) "Close third country", e.g. Candidate countries, EEA&EFTA, Mediterranean Countries.
- *Eligible for EC-funding if costs arise only on territory of*: (i) EU Member State, (ii) Candidate State prior to accession after Memoranda of Understanding, (iii) Candidate State after accession is a EU Member State and (iv) EFTA & EEA States after conclusion of specific agreement(s).
- *European dimension*: (i) international trajectories, involving the territories of EU Member States and "Close third countries" and (ii) at least two independent undertakings situated in two different eligible countries, of which at least one must be in EU.

Selection criteria

The selection of projects takes into account the contribution in terms of tonne-kilometres shifted off the road, as well as the relative environmental merits of the proposed actions and their contribution to reducing road congestion. The way to calculate the external benefits is explained in the tender documentation. At the same time projects are evaluated on the quality of the business plans and the readiness of projects to be carried out (as illustrated in the business plans).

The emphasis on tonne-kilometres shifted off the road is present throughout the Marco Polo programme and is therefore an evident basis for evaluation. Regarding tonne-kilometres as primary selection criterion, the following remarks can be made:

- The tonne-kilometres criterion is *biased towards long distance transport*, not taking into consideration local or regional circumstances, i.e. congestion and environmental problems that may have a more local character. A project aimed at shifting freight off the road between Rotterdam and Antwerp may have a considerable impact in terms of congestion relief, while at the same time, the tonne-kilometre criterion may be difficult to meet, given the relative short distance.
- The tonne-kilometres criterion is *biased towards bulk transport*. Vehicle kilometres are a more accurate criterion to assess external benefits.
- *Transport efficiency* is not measured through tonne-kilometres, but rather through the quotient of tonne-kilometres and vehicle-kilometres.

Notwithstanding the above, tonne-kilometres is regarded a practical criterion that provides a relative good indication and therefore is useful in project selection. It is however recommended not to apply the tonne-kilometre criterion too bluntly and provide room for selecting good projects that do not provide top scores in tonne-kilometres reduction, but score well in other categories, e.g. vehicle kilometres reduction and have high external benefits.

Project award rate

The first call of Marco Polo I resulted in a project award rate of some 20 per cent. In order to remain a market ‘interesting’ programme 20 per cent is considered a minimum value. Going below this threshold will seriously damage Marco Polo’s attractiveness and will negatively impact the submission of good proposals.

A balanced portfolio

An additional relevant issue for project selection is to come with a balance project portfolio, in terms of:

- Regional and country coverage, also including the new Member States.
- At least a minimum spread over the six defined actions.
- A spread over the alternative modes of transport to which cargo is shifted.
- A spread of high risk, high return projects and more modest projects.

12.2.2 Public relations

Given the large number of projects that need to be submitted on an annual basis in order to meet Marco Polo II objectives, the market needs to be aware of the opportunities and the requirements of the programme. Marco Polo awareness should be (further) increased, especially given involvement of the new Member States. Amongst others, the current website could be used to include successful projects, to indicate the type of projects that are eligible for funding. The following measures have been taken to improve public relations: organisation of an Info Day (prior to the second Call), an all-year available Help Desk, the establishment of a website, establishing Contact Points at each Member State and organising seminars in all Member States.

12.3 Conclusions

Marco Polo is currently run by three persons; given broadened future scope of the programme, both in terms of size and complexity, an increase in the Marco Polo workload is foreseen and consequently a larger number of staff (12-14 persons).

A balance needs to be established in the tendering procedure, through which a sufficient number of high quality projects will be submitted on an annual basis. Procedures should be understandable and transparent and selection criteria should provide a strong basis for evaluation, while at the same time the procedures should not become a (too large) threshold to submit good proposals. Tonne-kilometres shift remains a strong criterion, although some critical remarks can be made, i.e. bias towards long distance transport and bulk transport and the underperformance of transport efficiency projects in tonne-kilometres reduction achieved. There should be also room to accommodate a balanced Marco Polo II portfolio, with a regional spread of projects (with different risk profiles), over the six defined actions, and the various modes of transport.

As raising a sufficient amount of projects will be important, Marco Polo will need to (continue to) promote itself. Awareness should be raised, especially with new Member States. Another important aspect regarding attracting sufficient market interest is to raise the project award rate from the 20 per cent, as scored in the first call of Marco Polo I.

Annexes

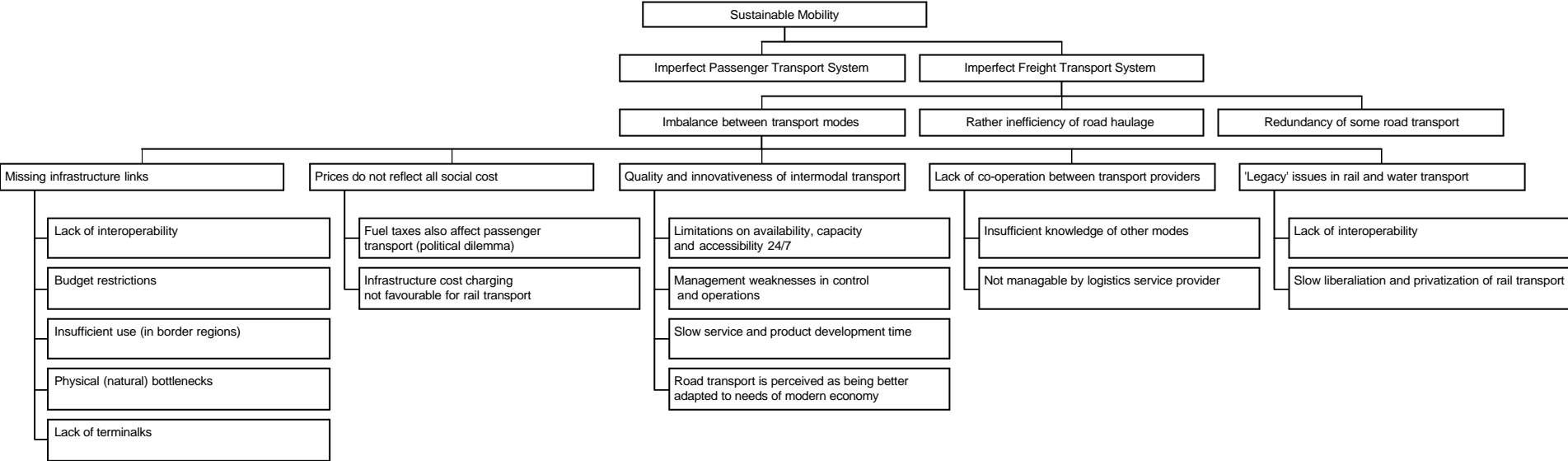
1. Literature
2. Problem trees
3. Logframe matrix
4. Analysis of national programmes
5. Summary of EC White paper
6. Lessons from the past
7. Budget calculation-parameters
8. Budget calculation-investments costs for typical projects
9. Stakeholders' consultation
10. Impact assessment

Annex 1 Literature

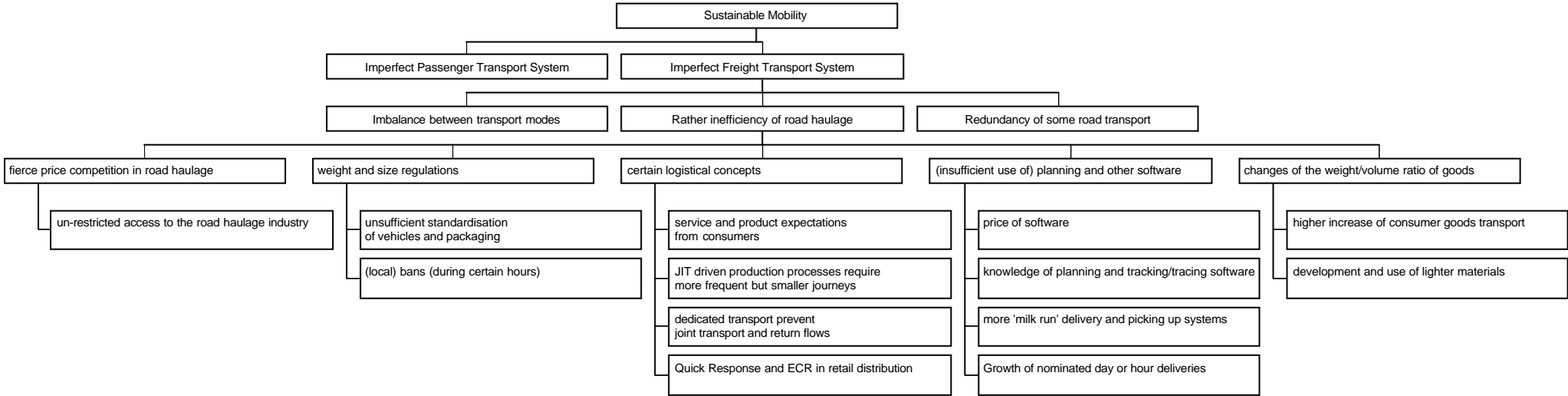
Nr	Name document (source, year)
1	Request for services in the context of the Framework Contract for impact assessments and evaluations (EC, 1 st , 2 nd and 3 rd draft, 2004)
2	Terms of Reference Marco Polo II (EC, March 2004)
3	Evaluation of the implementation of Council Regulation 2196/98 (PACT) (EC, November 2000)
4	The Marco Polo Programme – Update: first call for proposals (EC, October 2003)
5	Calls for proposals for modal split, catalyst and Common Learning Actions under the Marco Polo programme (EC, ?)
6	Regulation (EC) No 1382/2003 on granting of Community Financial assistance to improve the environmental performance of the freight transport system (Marco Polo programme) (EC, 22 July 2003)
7	Amendment (EC) no XXX to the Regulation (EC) No 1382/2003 on the granting of Community Financial assistance to improve the environmental performance of the freight transport system (Marco Polo II) (EC, 31 March 2004)
8	Communication: Building our common Future Policy challenges and Budgetary means of the Enlarged Union 2007-2013
9	Proposal ECORYS ex ante evaluation Marco Polo II
10	Call for proposals for Catalyst Actions in the sector for alternatives to international road freight (2002/C 110/10)
11	Press release: Commission decides to fund three transport actions following the Mini-Call Catalyst Action 2002 “test call”
12	Inventory of the State of the Art, EUTP II, August 2001
13	Proposal database first call Marco Polo I (EC, 2003)
14	Proposal recommenced for funding based on first call Marco Polo I (EC, 2003)
15	Marco Polo Programme – Call 2003 – Project Overview Forms (EC, 2003)
16	Pact and Marco Polo, internal DG TREN evaluation
17	Proposal for a regulation of the European Parliament and of the Council on granting of Community Financial assistance to improve the environmental performance of the freight transport system (Marco Polo programme) (EC, 04.02.2002)
18	Annex of project proposal of SAMS (as part of mini call)
19	Annex of project proposal of EUROCOMBI (as part of mini call)
20	Annex of project proposal of ARKON SHIPPING (as part of mini call)

Annex 2 Problem trees

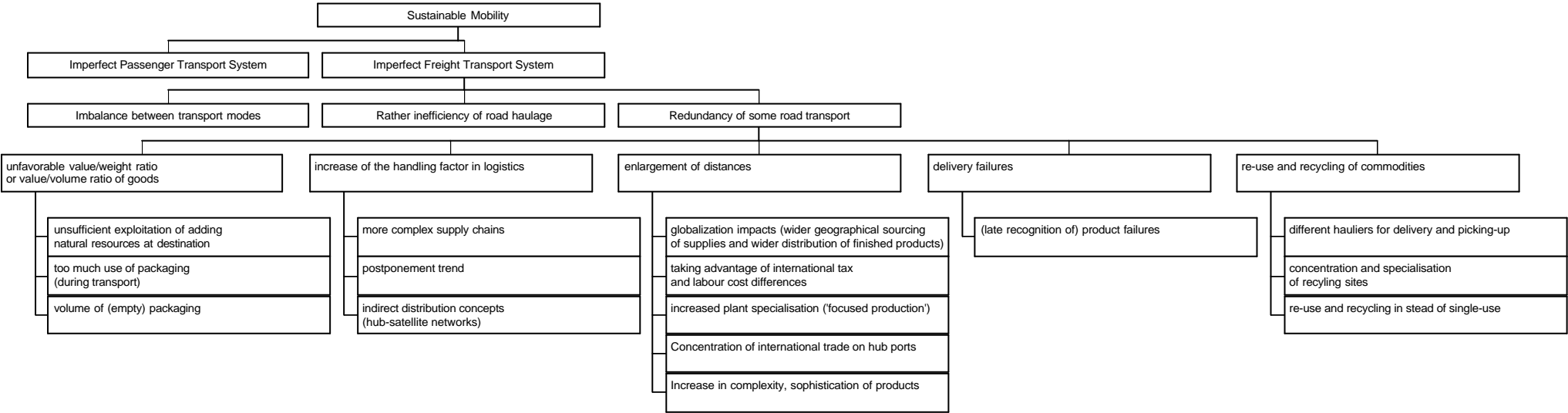
Imbalance between transport modes



Inefficiency of road haulage



Redundancy of road transport



Annex 3 Logframe matrix

Intervention Logic	Verifiable Indicators	Means of Verification	Assumptions/Risks
<u>General objective (overall objective)</u> To reduce road congestion, enhance traffic safety and to improve the environmental performance of the freight transport system within the Community, thereby contributing to an efficient and sustainable transport system.	Reduction of growth in air pollution (SO ₂ , CO ₂ , NO _x emissions), reduction of growth of road congestion and traffic accidents.	Statistics on environmental performance, congestion and traffic safety of the transport system in EU-25.	
<u>Specific objective (purpose)</u> To get at least the expected increase of international freight transport in the period 2007-2013 off the road.	Total decrease of international road freight transport of 144 billion tonne-kilometres for EU-25 in the period 2007-2013.	Interim/mid-term evaluations Ex-post evaluations Monitoring	<ul style="list-style-type: none"> • Development of international transport in period 2007-2014 in line with forecasts • Well performing alternative modes of transport, i.e. rail, inland waterways, short sea transport (organisation, infrastructure, etc)
<u>Operational objectives (results)</u> 1 To achieve modal shift from road to other modes 2 To avoid road traffic	1 Tonne-kilometres shifted to rail, inland waterways and short sea shipping 2 Tonne-kilometres off road traffic avoided	Ex-ante, interim and ex-post assessment of impacts of each project	<ul style="list-style-type: none"> • Technical risk • Management risk (competence and capability of project sponsors) • Political risk (on programme and project level) • Country risk (level to which EC subsidy is spent effectively, efficiently and without risk of loss or fraud)
<u>Actions (activities)</u> 1. Modal Shift Actions 2. Catalyst actions 3. Common Learning actions 4. Motorways of the Sea actions 5. Rail Synergy Actions 6. Traffic Avoidance Actions	1. 140 Projects, EC subsidy 146 mio euro 2. 42 Projects, EC subsidy 174.6 mio euro 3. 42 Projects, EC subsidy 15.2 mio euro 4. 42 Projects, EC subsidy 316.8 mio euro 5. 14 Projects, EC subsidy 64.0 mio euro 6. 70 Projects, EC subsidy 92.6 mio euro (see Chapter 7 Budget Calculation)	Number of projects submitted and approved Approved EC subsidy	<ul style="list-style-type: none"> • Success rate of projects in terms of achieving the expected decrease in tonne-kilometres • Sufficient interest from the private sector to develop services • Strong quality proposals

Annex 4 Analysis of national programmes

Source: EUTP

Country reports

1. Austria

The overall competencies for RTD policy in Austria are currently split up in two ministries:

- The Federal Ministry of Science and Transport;
- The Federal Ministry for Economic Affairs.

Traffic and transit in sensitive regions as well as social and environmental acceptability have always been the basis for the Austrian transport policy, due to the geographical and topographical situation of Austria within Europe. Thus RTD activities within sustainable transport and intermodality have a high political priority.

One of the Austrian transport policy goals in relation to intermodality is to focus more on the integration of environmentally friendly transport means for the long haul and to shift road traffic volumes especially to rail, inland waterways and combined transport (as defined by CEMT). Long-term basic research is primarily undertaken by universities, while small-scale studies, accompanying measures and demonstration projects are undertaken by transport planning institutes, consultants, experts from universities etc.

The Overall Austrian Transport Concept (GVK-Ö) was published seven years ago. This sets out the basic features of a transport policy. It aims to create an infrastructure, which meets every transport requirement and makes it possible to switch traffic to environmentally friendly modes of transport. At the same time an effort is made to avoid unnecessary traffic. The Federal Government intends that new, future investment in transport infrastructure should be consistently geared to these objectives and it decided to set clear priorities for the development of a sophisticated modern transport infrastructure on an intermodal basis. As a result the Federal Government and the Austrian Parliament instructed the Transport Minister to prepare a Federal Transport Infrastructure Plan (BVWP).

The Master Plan embodies the essential thrust of this Federal Transport Infrastructure Plan. Based on a calculation of optimum results, it states requirements as to how the railway and road network should evolve by the year 2015. Thought is also given of course to the Danube as a waterway and to the country's airports. The main message of

the Master Plan concerns the structure of the network. A survey points to sizeable regional differences in accessibility - especially by rail. A clear correlation was also identified between the accessibility of a region and its economic vigour. Being hooked into the transport system is a factor of major local and regional importance. Additions to the network are thus needed above all in areas where many Austrians suffer by being poorly accessible.

The Master Plan includes all the modes of transport and their associated links. Development of waterway transport on the Danube will dovetail with measures taken by neighbouring countries both up- and downstream, and the main focus is thus on road and rail. Major improvements are needed in broad areas of the rail network. Measures will aim to eliminate bottlenecks (if possible using intermodal transport) and slow sections of track and remedy inadequacies in regional development. The Federal Transport Infrastructure Plan and the Master Plan should be regarded as the practical implementation, as far as sophisticated modern transport infrastructure is concerned, of the 1991 Austrian Overall Transport Concept (GVK-Ö).

The principal transport objectives of the Concept include:

- Avoiding unnecessary traffic;
- Switching traffic to environmentally friendly forms of transport;
- Opening up regions to which access has previously been poor;
- Involving the populations affected, in order to secure public acceptance of transport policy.

In concrete terms the Master Plan contains general stipulations as to what the capacity and quality of the transport network and its links should be. The future network will link up to the Trans European Networks (TEN-T, TINA) as an integral part of them, but will also play an active part in shaping their future development.

The largest transport programme in Austria to date is LOGISTIK AUSTRIA (technologies for logistics and intermodal transport chains). This programme has been a successful platform for Austrian participation in the 4th and 5th Framework Programme. Among the activities can be mentioned:

- LOFT (low flow fast transshipment) which is an innovative terminal and technology concept for starting block train operations.
- Automated intermodal communication and information flows, planning and control systems for intermodal freight and design of an innovative logistics service centre.
- Modelling for urban freight transport flows (city logistics solution models).

On the policy side the research is focusing on areas like externalities, environmental impacts and emissions, integrated transport concepts for regions, infrastructure planning, and mobility management in the private sector.

The budget for Logistics Austria in the period from 1994-1998 was 9 million euro. The new programme for Logistics Austria was launched in October 1999 and has now a stronger direct link to the RTD results.

The MOVE programme, which was launched in 1999, focuses on two main areas of transport innovation. In its first target field it builds on the outcomes of Logistic Austria. The second target field addresses the service quality of public transport facilities. These priorities have been identified on basis of an in depth analysis of needs and problems in the Austrian transport system. The overall goal of MOVE is to enhance innovative activities, which improve the resource efficiency of transport and facilitate the use of environmentally friendly modes of transport. One of the targets aims to enhance intermodal freight transport.

The goals are:

- Improvement of operating efficiency of combined transport of goods.
- Improvement of logistics chain information management.
- Improving the access to rail transport services for peripheral regions.

A programme management committee has been installed for the implementation of MOVE. The main tasks of the programme management are to manage the acquisition of valuable innovation projects, to co-ordinate project funding and to monitor the implementation of the selected projects. The programme management will organise invitations to tenders. MOVE should significantly increase transport demand for environmentally friendly transport modes.

2. Belgium

Intermodality has only in recent years become a part of the Belgian transport policy and research. Some of the main problems are, as in the rest of Europe, related to the difficult operational co-operation between operators of the different modes and the interoperability of systems.

The Belgian transport research is separated between the federal level with the Ministry for Communication and Infrastructure and the Office for Scientific, Technical and Cultural Affairs (OSTC) within the Ministry of Research and the regional level with Ministries of Wallonie, Vlaanderen and Brussels.

The federal research programme "Sustainable Mobility" extends the former programme "Transport and Mobility" and is co-ordinated by OSTC. The programme aims to develop a scientific basis for research into areas like socio-economic effects of transport, transport demands and the effectiveness of transport policy and systems. On the strategic level the programme aims at providing a consistent Belgian transport research environment and to consolidate the international position of Belgian research. Three projects cover the area of freight intermodality: LAMBIT (A Tool for Achieving Sustainable Intermodal Transport in Belgium), SMIS (Sustainable Mobility Information System), and "Towards Sustainable Mobility..."

LAMBIT is a location analysis model for Belgian intermodal terminals to be used by decision makers in both the public and the private sector. In addition LAMBIT will demonstrate the competitiveness of intermodal transport and allow calculation of the impact of intermodal transport e.g. on the environment. The project will collect data concerning intermodal transport and intermodal terminals and connect these data with a decision support system to identify optimal location and terminal efficiency. The Vrije Universiteit Brussels co-ordinates the project.

SMIS is an Internet based tool that can be used to obtain information on mobility on all levels in Belgium (federal, regional, provincial, municipal, and from universities, research institutes, libraries, etc.). Université Libre de Bruxelles and Katholieke Universiteit Leuven co-ordinates SMIS.

The aim of "Towards Sustainable Mobility...." is to provide a set of policy tools that will assist in identification, quantification and valorisation of the external effects of increasing freight traffic. A user panel for each project in the programme monitors the progress and results. A steering Committee is created for the programme with federal and regional representatives and chaired by OSTC. The committee selects projects, first on the basis of the evaluation by international transport experts and after on the basis of the defined research needs. The programme received 10 million euro for the period 1996 - 2001. The results of arriving from the programme are used to support the policy decision-making. The Ministry for Communication and Infrastructure have no separate transport research programme but finance only small supportive studies.

OSTC only finance research projects and no demonstration projects in the field of transport. These are financed on a regional level. Furthermore, the regions undertake the policy and research on ports and inland waterways as it often relates to infrastructure investments. The regions have no dedicated programmes for transport research. The Belgian State co-finance construction of inland waterway terminals based on the restructuring of the sector toward further liberalisation, and in relation to the EU directive covering this process. OSTC arrange information days related to call for tenders and organise dissemination activities where results are presented within categories as Mobility, Environment and Safety. Belgian participants in European Commission launched transport research projects cannot receive co-financing from OSTC.

FEBETRA (Belgian Federation of road hauliers) is part of the Belgian Road Transport Institute. A Committee for intermodal transport comprising 90% of the road/rail hauliers (ex. maritime) has been established within FEBETRA. The main objectives of the Committee are to enhance the flow of information between members and to improve the performance of the sector by solving common obstacles. The group has a close contact to e.g. B cargo/TRW. Till now there has been no clear contact between the Committee and the Belgian government or the European Commission.

3. Denmark

An estimated 10 million euro a year is spent on Danish transport research. The main part of the national freight transport research is co-ordinated by the Danish Transport Council, an independent research body founded in 1993. The selected projects are financed on a yearly basis with the possibility of extensions. The total yearly research funding by the Transport Council is approx. 2 million euro and primarily allocated to universities. Research projects are supervised by a Steering Committee consisting of representatives from the research sector, public bodies and the industry. The research results are disseminated through seminars, publications and can be downloaded from the Home Page of the Transport Council. The Council was represented in the Transport Research Committee and the TAP Programme Committee and participates in some COST actions. The Transport Council promotes the European research programmes through seminars linked to the calls for proposals. Last seminar was held 5 March 1999 and linked to the first call of FP5. Co-financing is given to Danish participants in European research projects but the funds used for this purpose have yet been fairly limited.

The Danish Parliament decided in the beginning of 1999 to use 2.7 million euro over the next three years to enhance the national transport research environment. The funds will be allocated to the creation of an open research centre for transport and logistics. Until now no dedicated intermodal research has been mentioned in relation to the research centre. National intermodal transport research has received little attention, which relates to the difficult market conditions due to the fact that the distances in Denmark, the volumes and the international trade relations are all favouring road transport solutions. There is no specific programme within the Ministry or the Transport Council dedicated to intermodal transport research. The Ministry of Transport use approximately 200K euro a year on intermodal transport projects. Most funds are used to support projects internally in the departments. Funding decisions are taken through parliamentary hearings and in some cases public debates. The national policy development has been clearly influenced by the proposals presented by the European Commission and the transport related White and Green Papers. The goal is to secure the development for intermodal freight transport even though the national environmental benefits are limited. The national terminal policy is taking a bottom up approach with decisions taken locally. The role of terminals in the transport chain was investigated in the FREIA project (first call in FP4) but a more extensive analysis is needed.

The participation of Danish ports in European research and policy development has been moderate. Only the largest ports participate (Fredericia, Copenhagen, Aarhus, Aalborg) through the work in the Committee of the regions, the Danish Transport Ministry or through European organisations like ESPO and FEPOR. The terminal policy development in the ports has been lacking as the organisation of the users has been too fragmented.

Policy and research priorities:

More efficient freight distribution (city logistics etc.) through a combination of push and pull parameters;

- The political support for improving intermodality on a European level is too limited;
- Improved co-operation between operators is needed;
- Improved co-ordination of timetables between waterborne transport and inland transport is needed on a European scale;
- Improved knowledge of the driving forces behind transport demand;
- Data obtained through European research is not sufficiently detailed;
- Difficult to obtain the necessary information on European transport research results.

4. Finland

The Ministry of Transport and Communications undertakes the development of the national transport research. The Finnish national intermodal transport research and transport policy is closely linked to the policy of the European Commission. In 1997 the Ministry of Transport and Communications launched the TETRA programme (1997-2000) focusing on transport and telematics and the KETJU programme (1998-2002) dealing with intermodal issues.

The Finnish port policy is a part of the regional policy. A report published in 1998 states that some of the main obstacles for improved use of intermodal transport in the ports are the lack of transfer equipment and infrastructure capacity for handling unitised goods. The only two inland terminals serving intermodal transport are placed in Helsinki and Oulu. Other terminals handle ITUs but have no regular dedicated train service for intermodal transport.

The KETJU programme (www.ketju-ohjelma.fi) seeks to develop Finnish expertise related to the intermodal transport chain. Finland already has some globally significant equipment manufacturers. The programme addresses the logistics related industry, the provision of services, the use of services, research and training, transfer equipment and EDI. A mid-term evaluation of the KETJU and TETRA programmes has been published in English (Ministry of Transport and Communications, publications 32/2000). In three years 40 projects were launched and 50 organisations participated.

A new logistics research programme has been created to follow up on the KETJU activities. The objectives of the new programme are to help companies to take advantage of the new possibilities offered by information and communication technologies. The programme will focus on the strategic implementation of new operations models in logistic processes, on application of new control principles and possibilities for ERP systems, and on adaptation of material handling and transport systems according to the new requirements.

The TETRA programme (www.vtt.fi/rte/projects/tetra) was divided in nine project areas covering traffic management and information systems, fleet management systems, development of ITS systems for SMEs, system architecture and standardisation. The objective was to promote the creation of interoperable ITS systems covering all modes of transport by developing the required basic ITS infrastructure and information systems. Several demonstration projects have been launched and links have been made to the VIKING project supported by the TEN-T, especially on freight and fleet management. FITS (Finnish Intelligent Transport Systems) is the follow up on TETRA with the objective to facilitate the establishment of telematic services in private and public sector, to invest in politically important areas on transport telematics and to foster Finnish know-how. Of areas relevant to EUTP can be mentioned; Tracking and tracing of deliveries and Telematics in terminals.

The Ministry enhance the Finnish participation in European research projects through financial support to the preparation of proposals (5K euro for a partner and 10K euro for a co-ordinator) with the precondition that the proposal is ranked eligible for financing. The ministry is responsible for more than half of the Finnish national co-financing in Commission funded transport research projects. Other co-financiers of transport research include road, rail and maritime administrations, other ministries, and research institutes (e.g. VTT). The Finnish Ministry of Transport and Communications consider improved information exchange and access to research results as some of the most important issues to be dealt with in relation to European transport research at present.

5. France

One of the main research programmes in France for intermodal transport research is the PREDIT programme. The objective of this programme is to create an alternative to road transport through research into new solutions on a technical, economic, legal and structural level. Several working groups have been established within areas like; inland - sea interface, port development, inland intermodal terminals, information exchange, and improved rail operations. The programme is organised around five major targets in coherence with the national and the European transport policy:

- Development of the quality of service in public transport to make them more accessible, more comfortable and more reliable;
- Launching of new vehicles and environmental friendly transport systems;
- Safety improvement for vehicles and systems;
- Increased performance of companies on international markets;
- Promoting the realisation of the European transport networks.

The total budget allocated to PREDIT amounts to app. 1 billion euro, spread over 5 years of which 300 million euro will be financed by the state. The 70% will be funded by research institutes, industries, transport operators, and local authorities. Approximately 5% of the total budget is dedicated to intermodal freight transport.

PREDIT relies on four fields of RTD, gathering 13 research themes:

1. Strategic research (3%);
2. Analysis of knowledge on science and technologies useful in land transport (17%);
3. Technological objects, components, vehicles, equipment (53%);
4. Transport systems, including transport intermodality (27%).

Around 350 experts coming from ministries, public research institutes, universities, and public and private companies, ensure and supervise the progress of the programme during the five years. It aims at favouring rapprochement between public and private research centres and initiatives of co-operation between French industrials and European partners. In fact, it is one of the fields where European development is strongly involved including network interconnection, agreement of operating conditions, regulation of vehicles, etc. Several demonstration projects have been financed starting in 1999.

One of the main problems of the European intermodal transport policy is according to METL the missing link between transport research and policy. The research often reaches a dead end due to lack of political support in the implementation phase. Furthermore, there is a clear need to improve the access to European research results.

The French participation in European research projects is insufficient according to METL. Furthermore, the ministry feels that French transport research has less influence on the European transport policy compared to other countries. One of the reasons for the lacking French influence is according to the METL that the French research environments are too isolated in relation to European research. METL try to enhance the French participation in European transport research but several transport sectors are not geared to

work on European research level and the national competition makes it difficult to find a common ground for participation. Co-financing in relation to European research projects can be obtained from the ministry and is evaluated on a project-to-project basis. Projects involving technological development cannot receive financial support from the ministry.

6. Germany

For several years intermodal transport has received a high priority in the German transport policy, and now more than ever. The economic and environmental benefits have been the decisive factors for the intermodal policy effort and investments in intermodal terminals have been one of the means to reach the goal. Furthermore, Germany tries to support the European effort to promote intermodality through the European policy. The reasoning for the European participation is that intermodality works more efficiently if all involved countries participate on equal terms.

No research programme on intermodality and terminals exists in Germany today. Several intermodal projects have been launched earlier within the KV programme (Technology platform 2000+) including projects focusing on terminals as part of the intermodal chain. The intermodal part of the programme was cancelled as one of the main intermodal operators decided to leave the programme. Several industrial partners were involved in 2000+, where new transfer systems and technologies were developed, but the full-scale implementations of these systems are yet to be seen.

The aim of the programme "Flexible Transport Chain" is to reduce road transport by 100 mill truck km/year through the creation of a more efficient transport sector and through the use of intelligent transport systems and technologies. This programme has currently 16 large demonstration projects.

Several new national research studies have been launched this year e.g.: Logistic rethinking related to transport of empty containers, New systems for road pricing, Development of city logistics, and New terminal concepts for inland waterways.

Companies address the Ministry of Transport and the Ministry of Research to receive financing. The ministries develop the broad framework for transport research based on the interests from the industry. No co-financing is given to German participants in European research projects.

Terminal infrastructure can be financed by the German state as a part of the infrastructure investments with the aim of creating an extensive intermodal network and avoiding that operators focus on only a few main corridors. The Ministry of Transport subsidises the construction and purchase of handling equipment. Consortias can apply to build and operate the terminal and applications are evaluated by a group of experts from the public and private sector who estimate freight volumes, operational relations and terminal location. Financed terminals need to run with open access towards all interested parties. Originally 2 billion euro were dedicated to terminal investments in the next ten-year period. The rather large investments in transfer points in recent years were given based on prognoses of a growing market for intermodal transport, but today the prognoses are more pessimistic, decreasing the intermodal rail freight prospects from 90 million tonnes to 30 million tonnes per year, thus the investments have been stalled. DB plan to limit the number of terminals in the network from 60-70 today and down to 30 terminals in the future e.g. based on the new prognoses. A new committee has been formed to analyse how this negative trend can be reversed and the results will be used as foundation for future investments and research.

Bremen Guterverkehrszentren (GVZs) is one of the leading intermodal freight transfer or distribution centres in Europe, in terms of size and number of companies involved. In many respects, the Bremen facility is a prototype for other GVZs planned for Germany within the next few years. They serve as transfer points where short- and long-distance surface/freight traffic meet. The aim is to promote co-operation between the industries and to create logistic synergy. In essence, these GVZs are industrial areas where various freight transport enterprises are located, all of which remain independent, retaining their legal and economic autonomy.

Cologne Container Transfer Facility is one of Germany's most modern rail intermodal transfer facilities. This facility is the culmination of similar facilities started in 1969 in response to the increased rail use of TEUs by shippers. Planning started in the mid-1980s and today uses some of the most modern and technologically efficient intermodal handling equipment recently developed in Germany. Opened in 1991, the facility is presently being expanded, completion of which is expected by 1997. By then more than 64 million euro will have been invested in that facility by the German government.

The ports are considered as important nodal points in intermodal corridors and Germany has supported the European effort of including ports and Short Sea Shipping in the intermodal policy discussions. There is an intense competition between the large German ports so the minor ports seek towards specialised services in order to attract customers. The programme ISETEC has contributed with 36 million euro to develop the ports and in particular port community systems. Several German seaports pooled research and development funds and human resources in order to develop advanced marine terminal intermodal container-handling technologies and concepts to increase the efficiency and profitability of German seaports. The partners, which include BLG Bremen Warehouse Company, Bremen; DAKOSY Datenkommunikations-system GmbH, Hamburg; DBH Datenbank Bremische Hafen GmbH, Bremen; eurokai, Hamburg; HHLA Hamburger Hafen-und Lagerhaus, Hamburg; along with close co-operation of the Ministry of Research and Technology, developed the concept of the Container Terminal 2010. The concepts and technologies for that terminal involve advanced port-communications systems, terminal-planning systems, and cargo-handling systems. The goal is to co-ordinate shipping lines, agencies, forwarders, trucking companies, railways, and customs into one centrally controlled system that speeds the flow of containers in, through, and out of the marine terminal, and improves maintenance and repair.

Germany seeks influence in the European research and policy development in order to create synergy with national activities. National research results can be obtained through the universities, regions, ministries, monitoring agencies such as TÜV Rheinland and research institutes like SGKV where a library of intermodal research is under construction. The Commission funded PACT programme is considered as an important tool to boost intermodal activities.

Most intermodal transport research areas are covered today but there is a clear need to make research results more operational. It is not the role of the Member States to keep transport systems artificially alive and the technological development should not be an issue of public financing. Their role should be to help innovations to penetrate the market.

Policy should focus on the objectives and not on how to reach them; this should be addressed by the industry. Germany supports the creation of concertation activities as they see a need too improve the co-ordination of European and national research activities. Improved access to research results is demanded in order to obtain more European co-ordination activities and to assist cross-fertilisation of European research.

The summer of 2001 saw the foundation of a competence centre for intermodal transport called EURIFT (Europäisches Referenzzentrum für den intermodalen Frachttransport – European reference centre for intermodal freight transport) in Hamburg. Founders are the German City-Länder Hamburg and Bremen jointly with the Technical University of Hamburg-Harburg (where it is located), supported also by the European Centre for Transport and Logistics (ECTL), the Institut für Seeverkehrswirtschaft und Logistik (ISL) Bremen, the Technical University Chalmers in Sweden as well as DG TREN of the European Commission. Main issues are in a first step the collection of data which will finally broaden the knowledge about intermodal transport. In a second larger phase from the information gathered applications will be developed which will in the end be transferred into services for the founders and other customers. For the first three years funds of up to 2.2m € come from the City-Länder and the Commission, afterwards the centre is to be self-sustained by selling their services.

In August 2001 the German Ministry of Transport reported to the parliament about results of the above-mentioned 'Förderrichtlinie Kombiniertes Verkehr'. Among the recommendations given some points were particularly highlighted. Among them is the idea to provide special funds for new innovative intermodal projects, which will help them – if only temporarily – over the first difficult steps. The report also recommends keeping the PACT programme of the European Union running; within this framework a network of the various Short Sea Shipping Promotion Centres could be considered.

Trends in terminal construction

The results have shown that there is little or no need for additional intermodal terminals. The funding in the last period has therefore been allocated primarily to inland waterways where the major growth is located. A 2-year research and development programme was set up last autumn to adapt intermodal transport operation software to current needs of road/rail terminals. The software aims at an optimisation of loading unit flow, crane movement, personal disposition and shall give reference to the individual position of loading units waiting for pick-up. The software shall be installed in a reference terminal, further improved and then distributed to other terminals. Finally, when several terminals are operating on this specific software, easy data exchange between the terminals should be facilitated.

Logistics trends

Intermodal transport could, up to now, not offer time windows that could be accepted by courier, parcel and express operators. This had been difficult on longer distances in domestic operations. Railway rolling stock becomes rapidly more costly once the traditional speed limits in freight transport are increased, i.e. if speeds of more than 120 km/h or more than 160 km/h shall be realised. Nevertheless, some limited services could

be established in Germany. Normally, the intermodal transport train network in domestic Germany is operated at night time. Meanwhile, some operators consider day trains, mainly for international consignments that often arrive in the morning hour at the German border interface. This is especially the case for loading units arriving from Scandinavia in Lübeck-Travemünde for on carriage into South Germany and Italy.

No new solutions

Currently, Germany operates a 5 days a week scheme of intermodal trains that interface some 30 terminals and carry 30 – 33 million tons per year. This system seems to be rather at the end of its expansion possibilities. Unfortunately, these new endeavours have not shown commercial viability:

- A system of small regional trains that interface such areas that cannot deliver sufficient cargo to justify complete train operation has been calculated. The results have not been encouraging. If full costs for rolling stock and infrastructure use had to be applied, we easily arrive at costs of rail transportation of some 0,90 euro per loading unit and km, and this is a prohibitive value against market prices in road transport.
- A special built small unit “cargo sprinter” to carry some 8 TEU in intermodal loading units, powered by a diesel engine and independently operating in the rail network, has been abandoned after test runs.
- A system of small containers for handling of less than container load consignments did not show the commercial advantages needed for day to day operations.

Best Practice – Inland waterways

At least one success story is at hand: Inland waterway transport with ISO containers has increased tremendously in the last years. Growth rates of 18 % - 25 % per year are currently experienced. The transport of such containers concentrates currently on the Rhine valley. New inland waterway ships have come into service that can carry 498 TEU, i.e. that offer the capacity of 6 block trains. This example shows how competitive this way of transport is. In addition, a considerable part of the industry in the European Continent is concentrated along side the Rhine so that concentrated flows of cargo are common. Currently, hub port such as Mannheim/Ludwigshafen, Koblenz, Duisburg and Krefeld are developing. Additional inland waterway liner operations are established between these hub ports and side river and canals, so that the network served is constantly enlarged.

7. Greece

The general framework of the Greek Transport Policy is based on initiatives of individual actors (Ministries, governmental bodies/organisations, lobbies etc) rather than on a central policy scheme that follows a top-down approach. Even though the Ministries of National Economy and Finance have the overall control, most policy issues are under the responsibility of the relevant Ministries (Defence, Mercantile Marine, Transport and Communication, Environment, Physical Planning & Public Works, Public Order) or Governmental bodies/organisations (Hellenic Railway Organisation, Civil Aviation Authority). In addition, all governmental or semi-governmental bodies/organisations have developed short or long-term master plans that usually are the expression of needs and expectations for the modernisation and expansion of their activities. Most of these plans are made under the assumption of adequate fund availability or under very optimistic cost-benefit analysis scenarios.

Over the last few years, the Greek governments have followed a consistent policy of harmonising Greek legislation and transport policies with those adopted by the E.U, with some exceptions in order to protect the interests of specific groups (e.g. the cabotage for the short sea shipping in Greek islands is valid until 2004).

The transportation infrastructure in Greece is strongly affected by the landscape and geopolitical status of the country. The country is situated on the Balkan peninsula, at the south-east of Europe having a land frontier north-side with Albania, ex-Yugoslavia (FYROM) and Bulgaria, an east-side frontier with Turkey while sea forms a natural frontier to the west and south. Geography dictates the links with European Union Member States with three basic alternatives: Land links crossing the Balkan peninsula in the North and two sea-links: Through Piraeus port to Rotterdam port and through Patras/Igoumenitsa ports to Italian ports (e.g. Brindisi, Ancona, Bari). Greece seems to be isolated from the other EU countries due to surrounding sea and to non-EU Countries neighbouring.

The transport infrastructure includes 140 ports and 40 airports most of them covering the needs of islands that accommodate about 10% of the country's population. The railway network has a length of about 2.500 Km and consists of metric (35%) and normal (65%) gauges. The cargo market share of railways in Greece is insignificant mainly due to two reasons: (a) The majority of inland cargo is transported over medium (500 km) and short distances and (b) The lack of flexibility that characterizes the railway sector (in general).

A modernisation programme for the Greek railways infrastructure is in progress. The aim is to provide fast and reliable connections between northern and southern Greek areas. The effort focuses both at passenger and cargo transport sectors. Moreover, the replacement of the metric gauge lines by normal lines is gradually proceeding.

Within the above global framework of the Greek railways, combined transport makes its infant steps. Two small combined transport terminals exist, one in the vicinity of Athens (Ag. Anargiri), the other in Thessaloniki. A significant disadvantage of both terminals is the absence of links with the nearby ports of Piraeus and Thessaloniki (respectively) where significant import /export cargo flows are served. This situation will probably be

improved in the future. A new railway cargo terminal is planned for the Athens region (in Thessio Pedio) where a link with the new Piraeus container terminal (Ikonio) is foreseen. Similarly, in the new pier of the port of Thessaloniki, provision is made for the linking to the railway line.

The participation of the railway in the W. Europe-Italy-Greece corridor (e.g. Munich-Verona-Brindizi-Patra-Athens) was investigated in the European PACT Programme. The relevant studies revealed that the involvement of railways is technically and economically feasible. At present, the corridor is in operation, but the transport of load units to/from Patra is performed only by road vehicles. An initiative that will have very positive impact on the combined transport sector is the creation of Freight Villages. Currently, the freight transport activity is based on locations owned by the private sector. Unofficial spatial concentrations of activities specialized in freight transport have arisen in sub-urban areas or near the maritime ports of Piraeus and Thessaloniki, mainly due to the converging locations of small and medium road transport companies.

The Hellenic Chambers Transport Organization, has recently finished a study concerning the creation of a network of freight villages in Greece. This study has been financed by DG XVI of the European Commission. The main objective of the study was to define the number of Freight Villages needed and the candidate areas for their location, in order to satisfy the transport and logistic needs and contribute to the intermodal transport development in Greece.

8. Ireland

The transport industry in Ireland is in a period of large-scale development and investment. Unprecedented levels of investment in transport infrastructure are being made which will significantly enhance conditions for the efficient freight movements. The Department of Public Enterprise has a major part to play in providing a supportive framework to the industry through its policy making and regulatory functions in the areas of air transport, airports, haulage transport and passenger transport, and through its role in transport companies such as: Coras Iompair Éireann, Aer Lingus, Aer Rianta and Irish Aviation Authority.

The Department of the Environment and Local Government has responsibility for vehicle emissions (policy and legislation), roads infrastructure (through the National Roads Authority (NRA) and local authorities), vehicle licensing, driver licensing and driver testing, road safety (through the National Safety Council, the National Roads Authority (NRA) and local authorities). The Department of the Marine and Natural Resources has responsibility for Maritime Transport.

Córas Iompair Éireann (CIE) is Ireland's state-owned national transport company. CIE Group has three operating companies covering bus and rail services throughout the Republic of Ireland and to and from Northern Ireland. It has a consulting division - CIE Consult - and provides legal and other services to the bus and rail companies.

Iarnród Éireann was set up in 1987. The principal objective of the railway company is to provide a railway service and a road freight service. Roads carry 86% of commercial freight traffic today and the rail sector is facing problems related to the limited investments in the sector in recent years. The average age of Iarnród Éireann's locomotives is 29 years, carriages 20 years and more than half the track is more than 50 years old. This results in service problems and the Athenry-Limerick line has a speed limit of 30 mph due to the limited capacity of the old track. In the last few years track work on the railway has been upgraded, running speeds accelerated, more frequent services provided, and this has been supported by changes at railheads for the handling of unit load traffic and intermodal freight transfers. Iarnród Éireann Freight offers a range of services, from Fastrack parcel delivery, to containerised liner trains. The major products transported include cement, beer, mineral ores, ammonia, timber, oil, beet and fertiliser. Furthermore, Iarnród Éireann Freight offer services as Fastrack, Containerail, Roadliner, and is responsible for the operation of Rosslare Europort.

The Chartered Institute of Transport in Ireland (C.I.T.I.) is engaged in all modes of transport and distribution, through education courses and development activities. The institute promotes professionalism in transport, keeps its members informed of developments and provides a practical forum for discussion and debate on transport issues. The Institute makes written submissions to the Government on proposed legislation or events, which will have an impact on the Transport Industry. Examples in the past have included submissions on the Annual Budget, the use of EU Structural Funds and the Dublin Transportation Initiative proposals. At a European level the Institute represents its members in European organisations at a number of different levels. This

ensures early input into the formation of views, which influence the shape of the European Transport Policy.

Dublin Port is the principal port in the Republic of Ireland. Dublin Port Company is a self-financing, semi-state organisation. During the last five years over £50m was invested in the port to create new facilities and improved terminals.

9. Italy

The progressive globalisation of the goods market has consequences for the Italian transport structure. This has in particular had the following effects:

- Extension of the market for enterprises and the Italian logistic infrastructures;
- Increased strategic importance of Southern Italy as a possible distribution platform, with a particular reference to the maritime/port sector;
- New competitors entering the market;
- Increased transit traffic in transalpine areas.

The phenomenon of outsourcing logistic services is growing fast in Italy. This produces strong and fast changes in terms of segmentation of the market, re-structuring of the enterprises and of quality and typology of the services. Its impact is very strong on innovation driving towards new economy-based development.

The performance of intermodal freight transport is dependent on the service quality of the transfer points throughout the logistic chain. One of the main outcomes of poor quality in Italian terminals/ports is the waiting times. The progress in terms of utilising intermodality have developed new innovative and competitive services. The Italian transport policy aims at making a more even freight distribution throughout sustainable modes to avoid problems of congestion road safety and to create a more efficient transport sector. The progress realised to date have not yet resulted in quality improvements high enough to compete with other more enhanced markets, only to maintain the "status quo".

The financing legislation of the Italian freight villages does not foresee the financing of intermodal transport centres outside the freight villages and this represents a problem to be faced. The logistic platforms are financed by private investments. Public funds can be used only to invest in new infrastructures (accession). Generally the logistic platforms are integrated in the local distribution network and equipped with new information technology systems.

There is a need for a stronger knowledge of the urban freight distribution mechanism (demand), thus the ministry has made proposals on:

- A law foreseeing a manager in city logistics in the regional, provincial and local community;
- A constitution of a central observatory for the harmonisation of the different research;
- Support to pilot projects.

Intermodality in Italy has been strongly and positively harmonised by the policies of the neighbouring countries, which have imposed limits to the transit of road vehicles and by the configuration of the territory, which give intermodality a competitive advantage in relation to road transport. This great potential Transport of swap-bodies and semi-trailers has been able to develop and in a short time become the first in Europe in terms of cross border traffic and the second in terms of dispatching (expeditions). The Italian transport policy will have to propose policy proposals necessary to obtain this development of intermodality. The alpine crossings cannot depend too much on the weakening of road transport. The outcome might have huge consequences for the efficiency of the

international transport services and on the localisation of important industries in Northern Italy. The Italian Government is therefore proposing to the EU some supportive actions to be taken. One of the objectives is to encourage the entrance of private operators in the market. Today in Italy there is only one private operator of swap-bodies, which offers its services on 4 international "relations" (Germany, UK, Benelux and Spain) as international forwarder.

Intermodality, by use of shuttle services, has reached a very high standard of quality. But also the intermodal operators have encountered rail problems, especially between Italy and Germany. Two of the main reasons are the lack of available of traction material and the lack of available of Italian driving staff. The delays are serious for the intermodal operators due to the repercussions on the quality of the service. Another problem is the insufficient number of terminals and their limited capabilities and this is a serious problem especially in Northern regions, such as Lombardia.

The critical character of the intermodal transport road/rail is represented by the difficulties in slot distribution, limitations on weight and the length of the trains, the infrastructure of the terminals making it difficult to increase the capacity of the existing terminals, and the lack of terminals in certain areas. The freight villages are facing problems of financing and the quality of the railways service has to be improved in particular related to punctuality, flexibility, efficiency of the rail terminal of departure and arrival, performances of the rail service, the transport price, and the monitoring of units during transportation.

Major progress has been accomplished in the sector of maritime container traffic. The Southern ports have provided an important contribution to this progress. The key to this success is to be found in different elements: the extension of the transshipment technique, the reduction of the handling costs, a professional maritime tertiary sector, and the development of the port logistic and hinterland transport. In order to develop themselves, the Italian rail services can: increase the penetration of the Italian ports in the central European markets through competitive rail services from the Italian ports, provide long distance services for transit traffic, or concentrate the offer on the Northern Range ports. The maritime companies can be strongly influenced in the choice of the port stops by the presence of efficient rail connections in the ports themselves.

Synthesis of the Italian intermodal policy proposals:

The proposed actions can be divided into 7 levels of intervention:

1. Actions for the restructuring and re-organisation of the transport companies;
2. Actions in order to reduce the limitations and improve the quality of the transfer points;
3. Actions to improve intermodal services to overcome problems in the Alpine crossings;
4. Actions to improve the modal equilibrium and to decrease the road traffic density;
5. Actions to deepen and update the knowledge of city logistics;
6. Public monitoring of the rail service quality;
7. Creation of a national agency for the promotion of the Italian logistic system.

The focus is on the imbalance in modal split. An increase of 31% is foreseen in freight transport in the coming years with 90% on road, 3.3% intermodal and 6.7% Short Sea Shipping. The goal is to change this scenario to 87.2%, 5.6% and 7.2% respectively if the proposed national Master Plan is successfully implemented. One of the focus areas is a systematic data collection to be used for policy-making and research activities. Data collection activities have been running for years both on national and European level, but without tangible results. Furthermore the plan is to extend the role of the freight village to strengthen corridors to Eastern Europe.

10. Sweden

In March 1998, the Swedish Government presented its transport policy for sustainable development. The overall objective of the transport policy will be to ensure socially, economically efficient and long-term sustainable transport resources for the public and industry throughout Sweden. Focus on freight transport is increasing as a result of its great importance for economic development and its increasing share in environmental problems. Continued close co-operation on transport issues within the Baltic Sea region has a high priority. Sweden works within the EU for an active transport policy that promotes a co-ordinated European transport system. The Swedish transport programme supports research, development and demonstration activities. The programme aims to improve road safety, improve the environment and increase accessibility. This is accomplished through increasing knowledge of the whole transport process and of the technical means available.

Intermodality and intermodal terminals got plenty of attention in Sweden which is the first country in Europe where infrastructure and operation was separated (1988). An intermodal terminal system has been successfully developed in Sweden, i.e. the Light Combi system, where minor infrastructure changes along the rail line have created small intermodal hubs manned by the loco drivers and where the train has its own transfer equipment to handle intermodal units. The system makes use of more terminal stops, as the single handling is less time-consuming than in ordinary intermodal terminals. In particular it is suited for low flow freight corridors and is a solution that will be prioritised in the future. Intermodal transport only constitutes a few per cent of the total Swedish freight transport, even though a huge effort has been made to enhance its use.

Regional support is given to the establishment of transport centres and intermodal terminals.

VINNOVA, the Swedish Agency for Innovation Systems, became operational on January 1, 2001. The Agency integrates research and development in technology, working life and society. VINNOVA will co-operate closely with a network of private and public players who will jointly develop, disseminate and apply the new knowledge. During the first year VINNOVA will concentrate primarily on bringing to completion the programmes and projects carried on by the authorities that have merged into VINNOVA, namely the Swedish Transport and Communications Research Board (KFB), the R&D unit of the Swedish Board for Industrial and Technical Development (NUTEK) and sections from the Council for Work Life Research (RALF).

The Swedish Institute for Transport and Communications Analysis, SIKa, is an agency that is responsible to the Ministry of Industry, Employment and Communications. SIKa was established in 1995 and has areas of responsibility in the transport and communications sector. SIKa analyses and presents data and establishes a basis for planning in the communications sector, provides the actors in the sector with statistics, descriptions of the present situation, forecasts, and descriptions of consequences and takes part, together with the transport agencies, in the work of following up and working out the details of the national transport policy goals.

Banverket have the “sector responsibility” for the railway sector including operative matters. Their responsibility in the intermodal field has increased recently, and they play a large role in relation to terminals. The responsible department is "Järnväg och Samhälle".

The Department of Transportation and Logistics at Chalmers University of Technology is specifically dealing with intermodal freight transport, where it is the subject of a fast growing research activity. A research programme called "System for combined transport between road and rail" has been launched by Chalmers.

The programme analyses both classical and innovative intermodal systems such as:

- Classic combined transport
- Light-combi
- Express combi
- Rolling highway
- Integration with air and sea

The future structure of the intermodal market depends on the way new market challenges are handled. Efficient full trains is one of the solid services where new operators enter to make a profitable business. Furthermore the programme looks at:

- Post-panamax container vessels and the demands to hinterland traffic ;
- If double-stack on certain routes is feasible (in particular for the corridor between Stockholm and Gothenburg);
- Frequencies.

Since its foundation in 1992 the EU-R&D Council promotes and co-ordinates the Swedish participation in the EU RTD framework programmes. The Council is the National Contact Point for the Fifth Framework Programme and is responsible for information dissemination in Sweden. They serve the Swedish research community free of charge with advice on questions related to the EU RTD programmes and the application procedures. It is difficult to obtain national co-financing to European RTD projects; there used to be dedicated funds for co-financing Swedish participation but there has been no prolongation for this programme. The industry and in particular Swedish Railways stopped funding RTD projects, as they have been more focused on keeping up with the growing international competition on the market.

11 Switzerland

The Swiss National Science Foundation (SNSF) supports scientific research at Swiss universities and other scientific institutions and awards fellowships to young scientists. The Foundation Council is the governing body of the SNSF, founded in 1952 as a foundation under private law. Its members represent scientific, cantonal, federal and economical entities. The executive organ is the Research Council, which assesses the research proposals. It is divided into four divisions. The Local Research Commissions award fellowships for prospective researchers and assist the Research Council in its tasks. The Administration is located in Bern. It prepares and executes the decisions of the Foundation and Research Councils and is responsible for all administrative and financial duties.

The National Research Programmes play an important role in the promotion of research by the SNSF. By these programmes researchers at universities as well as at other research institutions contribute to the solutions of specific current problems. Most of these programmes are interdisciplinary, and combine theoretical research with practical application.

The Swiss Transport and Environment Research Programme NRP 41 ("Transport and Environment - Interactions Switzerland/Europe") was established to improve the scientific basis for a sustainable Swiss transport policy and to strengthen the interaction between the Swiss and the European research in this field. NRP 41 intends to become a think-tank for sustainable transport policy. It shall supply contributions from all relevant disciplines towards the efficient and sustainable satisfaction of mobility needs. The project B2 (location and potentials for combined transport) is being integrated into a general framework set up in order to build a new general transportation model in Switzerland. This model will bring together a research project on road transport modelling, the project B2 for intermodal modelling and research on a rail model carried out at the Transport Study Service of the Ministry of Transport. 52 research projects are now at work and the first publications are available (English version).

Two research projects have analysed the potential and the bottlenecks for intermodal transport in the Alps region:

IRE looks at the conditions on the supply side and more specifically the strategies of relevant actors in order to identify potentials and weak points of combined transport on transalpine links.

MecoP analyses shippers' behaviour with the goal of identifying critical service qualities that could indicate levers for a policy of promoting intermodal services. The principal aim of the research was to provide basic elements to support decision-making in the field of promotion of intermodal solutions. The analysis has shown that on this market success increasingly depends on guaranteeing delivery times in a 24 or 48-hour cycle. The sensibility with respect to these cycles depends less on the type of goods or the industry but more on the market segment. The opening hours of intermodal terminals were found very critical. Intermodal transport with Italian origin is only competitive to the north of

Basel. Intermodality cannot further to the north except if a night ban is imposed on road traffic.

Looking at improvement potentials, a first possibility to reduce total transport time would be provided by anticipating the control of freight in the Italian terminals. Performing this control in parallel to the loading of the goods would save about 2 hours of time between closing of the terminal and train departure.

The following policy measures are considered:

- Technical improvements of infrastructure and planning, subsidies and research.
- Improved organisation of the transport chain through optimisation of the interfaces (promotion of integrated services, international co-ordination, implementation of free access.
- Improvement of the competitive conditions for intermodal transport as compared to road through subsidies, road taxes, and regulation.

The strategy proposed by the Swiss government (1999) proposes a package of measures containing most of the instruments discussed in this report that can be introduced unilaterally.

The main pillars of such a policy are:

- Active promotion of competitive allocation of access rights, allocation of slots by the confederation (active regulator, international involvement to promote free access, dialogue with Italy).
- Equal treatment of Swiss links with regard to subsidies on access prices to avoid introducing a bias in transit competition. The tendering should promote a market-oriented policy of subsidisation. This would avoid negotiation of single subsidies.
- Provision of funds for subsidies on request in specific cases of new transport and for the funding of important investments that improve the quality of the transport chain (above all in Italy).
- Introduction of monitoring that permits allocation of subsidies in function of changing market performance. A containment of the piggyback transports and subsidies on access prices for full wagonload traffic should be considered.
- The non-alpine part of Switzerland should be opened to 40 tons trucks for transport to and from the intermodal terminals. A distance independent partial abolition of the LSVA promotes this transport and avoids a distortion in favour of long distance transport. The latter would endanger traditional rail transport as a terminal feeder.
- The night ban on trucks should be kept in place and the controls on road transport (driving hours, weight, speed) should be intensified because of their important positive effect on intermodal transport.

The potential analysis based on actual data on transit flows through the Alps demonstrates that in the year 2005 63% or 1.2 mill. TEU potentially passing through Switzerland could be using intermodal transport - given their distance and their characteristics. If these transports could effectively be shifted on rail, the combined transport volume through Switzerland would triple. According to Swiss regulations, an amount of 600,000 TEU per year should be shifted to rail. This means half of the maximum potential. First estimates have shown that this is only possible if the measures do not only comprise lower relative

prices of rail transport but at the same time a promotion of quality and flexibility of combined transport services offered. The subsidies together with free access to the network have, therefore, to function as a catalyst for further improvements.

Sea transport across the Alps

The port of Rotterdam is the hub for a large proportion of international goods travelling to and from Europe. Many ship containers from Rotterdam are even transported across the Alps to Italy. Numerous interviews and statistics were used by the researchers with the objective of illustrating these cargo flows to and from the seaports. They estimate that approx. 5% of freight crossing the Alps originates from container traffic to and from Mediterranean and North Sea ports. Italy's ports, in particular Gioia Tauro, have significantly improved their importance and reliability within a very short period of time. Consequently, a large proportion of goods traffic from Asia will be re-routed: It is likely that Italy will shift more and more traffic from Rotterdam to its own ports, resulting in less transalpine traffic. A larger catchment area for Italy's ports extending northwards across the Alps is a mid-term scenario that requires improvements of the Italian rail infrastructure. Efficient development of Italy's ports may represent an important and possibly rewarding challenge for intermodal transport systems.

Combined Traffic must be faster

This study within Project B4 analyses in detail the combined goods traffic through the Alps. Numerous interviews with service providers, and various cost and time comparisons of typical transport volumes, provide interesting data for this market segment. According to this study, the time factor is more important than the price - as fast overnight delivery is very important. The (currently valid) ban on transport at night in Switzerland has a major influence on the market opportunities of intermodal transport.

PRIMOLA is a detailed database on transalpine freight transport demand and supply and the development of a planning tool for the freight transport based on the level-of-service variables. The Italian region of Piedmont and the Swiss cantons of Vaud and Valais have initiated this project. It is carried on by ITEP and the Transport Department of the "Politecnico di Torino" as part of the cross-border co-operation programme INTERREG II Italy - Switzerland.

TSO (Institute of Transport Systems and Organisation) informs about current research in transport infrastructure and network management. In many cases, EU projects need a co-financing, besides the usual financing by the Swiss Office for Education and Science (BBW/OFES). For the first time, based on an initiative of NRP 41, and supported by BBW/OFES, the Swiss Contact Office KBF collected the information of all relevant Federal Offices on their interests, possibilities and principles for co-financing.

SwissCore (Swiss Contact Office for Research and Higher Education) promotes Swiss participation in European research and education programmes. Swiss scientists from industry, universities, Federal Institutes of Technology, universities of Applied Sciences and from other private or public research institutions.

KBF is a coordination office for Swiss participation in international research projects. A list of the newly named national contact points for the various programmes have taken

over the work of the KBF-Zurich from January 2000 until the creation of a national central contact point. Swiss information on transport and other EU-RTD-programmes can be obtained at KBF.

The (currently valid) ban on transport at night in Switzerland has a major influence on the market opportunities of intermodal transport. A much greater influence on the behaviour of operators is seen in the new HVF (Heavy Vehicle Fee) / LSVA (Leistungsabhängige Schwerverkehrsabgabe) which is introduced from January 1st, 2001. Heavy goods (road) transport is to pay not only for infrastructure but also for external costs (noise, pollution, accidents, etc.) – two thirds of the revenue from the fee go to the modernisation of the Swiss rail system (NEAT, etc.) and the rest is used for infrastructural improvements. All vehicles from Switzerland as well as abroad will be liable to the fee which is calculated based on the maximum laden weight (truck + trailer; > 3.5 tonnes) and on the kilometres driven. It also considers the emission values of the vehicles.

12. The Netherlands

The Directorate-General (DG) for Freight Transport is a part of The Ministry of Transport, Public Works and Water management. This DG is divided into three policy departments: transport safety, transport industry and general freight transport policy. The division Infrastructure, Ports and Intermodal Transport is a part of the general freight transport policy department. This division has four policy-advisors and one assistant responsible for the intermodal transport policy.

The goal of the Directorate-General for Freight Transport is to contribute to a safe and sustainable freight transport system. The policy unit co-operates with other Dutch ministries e.g. in the field of spatial planning policy (accessibility by multiple modes of transport of industrial parks) with the Ministry of Housing, Spatial Planning and Environment, and in the field of intermodal transport and terminal development with the Ministry of Economic Affairs.

An association of Inland Terminal Operators has been set up due to a need among the inland terminal operators to enhance their operational position by developing new activities in areas like EDI, liability, repositioning of empty containers, the image of inland terminals and legislation issues. Furthermore, several regional organisations promote intermodal transport (The Foundation for Combined Transport, Rotterdam Internal Logistic, 5 Modes District Network, Multimodal Transport Region Northern Netherlands, Multimodal Co-ordination and Assistance Point). These organisations have primarily a regional function.

Inland transport by barge receives extra attention, in order to effect a shift from road to inland navigation. The following measures serve to support favourable initiatives from the market and to support a further liberalisation of inland transport.

- Support for the development of terminals for container transshipment: funds have been reserved to support promising initiatives promoting intermodal transport, e.g. a container terminal in Utrecht-Lageweide;
 - Support for the development of terminals for regional distribution.
- The whole inland shipping sector will be liberalised stepwise to the year 2000.

Pilot projects for freight transport by rail are being undertaken in the Mainport Schiphol, as a start to the project 'Intermodal Freightport Schiphol'. The airports Schiphol, Frankfurt and Paris/Charles de Gaulle have entered into a co-operation aimed at launching a rail product onto the market in the short-term, which provides for transport of airfreight between the mainports.

Research into modal split, modal shift and the possibility of pipelines as a supplement to other transport modalities, and research into how competitive the cost prices can be in the course of time, is becoming a more pressing issue.

The Dutch government has adopted the plan of approach "Transport in Balance". The policy objectives of Transport in Balance are:

- Reinforcement of the competitive position of sustainable transport, particularly rail, inland shipping and short sea by infrastructure initiatives;

- Reduction of the environmental load from road traffic by technical measures and increasing efficiency;
- Improvement of the accessibility of economic centres for goods traffic on the road.

Short sea shipping is increasingly being seen as one of the modes of transport that will be able to make a contribution to turning the trend away from road transport. This particularly concerns good flows over rather long distances. There is already an extended network of short sea services to some 200 destinations in Europe, primarily from Rotterdam.

Programmes/projects

Underground Tube Transport Systems (UTTS)

The first progress report “Underground Freight Transport: A challenge for the future” was presented to the Parliament in 1998. According to the vision one-third of the inland freight transport can be transported by UTTS.

A scheme for subsidising inland terminals that serve combined transport. The basic principles underlying the scheme are as follows:

- Private firms should take the initiative to invest in a terminal;
- Over-capacity and cut-throat competition should be avoided;
- Subsidisation will be restricted to public terminals.

The basic aim of subsidising terminals for combined transport is to complete the inland terminal network and to try to keep up the transshipment capacity with growing demand. The European Commission still has to approve the subsidisation scheme.

The modal shift scan project promotes the modal shift from road to rail, inland shipping, short sea and combined transport. To achieve this, the logistic chain of hundred shippers has been scanned on possibilities for alternative modes of transport.

Pilot Loading Units contributes to the standardisation of loading units for the national and continental transport- and distribution market. In the first phase of the project (June '97- July '98) the project concentrated on existing container concepts and on standards for new loading units. The second phase (July 1998 – February 1999) focused on finding companies wanting to contribute to, and invest in, the development of new loading units.

The Platform Modal Split carries out several projects:

- Target force modal shift (modal shift to rail and inland shipping)
- Intermodal explorer (develop system as “yellow pages”)
- Strengthening the position of inland terminals
- Development of a shuttle network for inland shipping
- Transparent structure of tariffs

The objective is to achieve a modal split in favour of rail and inland shipping. The focus is primarily concentrated on transport of standard load units.

Promotion arrangement for Combined Freight Transport (SGG) aimed to stimulate carriers and shippers to invest in equipment for combined transport.

Programme for Multimodal and Combined Transport (PROMIT)

The programme promotes projects that result in a modal shift from road to inland waterways, short sea and/or railways. It is intended that the PROMIT-programme will be a part of an environmental programme with a larger scope by the year 2000.

Industrial parks accessible by multiple modes of transport

Concentrating businesses near a terminal will result in combining goods traffic through this terminal for long-distance transport. This will improve the quality of the terminal. In turn, a high quality terminal will attract more businesses and stimulate the use of alternative modes of transport by rail and water.

Pilot Goed aan Boord

In consultation with several commercial parties the possibilities of a “self-service low-cost container terminal” have been explored. At this moment it is being examined whether it is feasible to build a prototype of such a terminal at a location in the east of The Netherlands.

In three tenders from the Demonstration Programme Telematics in Transport, companies in the transport sector have been able to gather experience with the prospects offered by telematics aimed at information advancement along the chain.

13. United Kingdom

Privatisation has in recent years been used as a tool to solve problems related to interoperability and network efficiency. Limited or no intermodal freight transport research is launched by the Department of Transport (DoT), as they do not believe that it is the obligation of the department. The present European intermodal freight research is, according to the DoT, too close to market operations. They prefer that the market, and not the research sector, influence policy actions. The DoT believe that freight operators have sufficient knowledge of the market and it is up to them to create intermodal systems when the demands arrive from the market.

The main rail links suffer from capacity problems and the DoT focuses on the possibilities for upgrading these rail lines. One of the main policy issues related to the capacity restrictions is whether priority should be given to freight or passengers. Today passenger transport is prioritised in the distribution of capacity.

One of the problems within the intermodal freight transport market is that market prices are not consistent with the reliability of the service. The rail sector needs to be more commercial. The DoT promotes greater use of the unfulfilled potential of the railways, inland waterways and coastal shipping for freight traffic. They believe that improved planning and regulation will contribute to assisting these sectors. No terminal policy exists today, but structural funds or regional funds are given to constructions.

The Transport Research Laboratory (TRL) has been at the centre of much of the development of government policy on the integration of transport in the UK. They perform intermodal freight RTD but not initiated by DETR.

The Institute of Logistics and Transport (ILT) is an active player in the logistics and transport policy. It makes regular submissions on current issues to the UK government, European Commission and other bodies, and publishes reports and papers. ILT has established a freight transport working group that deals with intermodal issues as intermodal distribution, including freight interchanges and the potential for road to rail transfer – industry and public issues - implications and recommendations for national policy and for regional/local strategies.

The Institute for Transport Studies (ITS) at Leeds University is one of the leading interdisciplinary groups involved in teaching and research in transport studies, with a staff of over 40 and typically some 80 postgraduate students.

Cranfield Centre for Logistics & Transportation (CCLT) deals with transportation management, and logistics and supply chain management. They participate in a range of European Commission funded RTD projects and activities where intermodal research is in focus.

Napier University has joined forces with industrial partners and set up a major Transportation Research Institute in Edinburgh. The Institute concentrates academic and industrial expertise in an effort to find real solutions to transport problems. The expertise in different fields of transport research is currently focused through seven groups e.g. The

Role of Logistical Structure in the Development of Rail Freight Services in the UK, and European Marine Motorways (EMMA), a project funded by the European Commission and led by Napier University. EMMA is a feasibility study into the potential for high-speed Ro-Ro ferries to attract freight from the roads onto the sea along coastal routes of Europe.

Annex 5 Summary of EC White paper

1. Objective

To strike a balance between economic development and the quality and safety demands made by society in order to develop a modern, sustainable transport system for 2010.

2. Act

White Paper submitted by the Commission on 12 September 2001: "European transport policy for 2010: time to decide" [COM(2001) 370 final - Not published in the Official Journal].

3. Summary

Introduction

The Commission has proposed 60 or so measures to develop a transport system capable of shifting the balance between modes of transport, revitalising the [railways](#) , promoting [transport by sea](#) and inland waterway and controlling the growth in [air transport](#) . In this way, the [White Paper](#) fits in with the sustainable development strategy adopted by the European Council in Gothenburg in June 2001.

Background

The European Community found it difficult to implement the common transport policy provided for by the Treaty of Rome. The Treaty of Maastricht therefore reinforced the political, institutional and budgetary foundations for transport policy, inter alia by introducing the concept of the [Trans-European Networks](#) (TEN-T).

The Commission's first White Paper on the future development of the common transport policy, published in December 1992, put the accent on opening up the transport market. Ten years later, road cabotage has become a reality, air safety standards in the European Union are now the best in the world and personal mobility has increased from 17 km a day in 1970 to 35 km in 1998. In this context, the research [framework programmes](#) have been developing the most modern techniques to meet two major challenges: the trans-European high-speed rail network and the [Galileo](#) satellite navigation programme.

However, the more or less rapid implementation of Community decisions according to modes of transport explains the existence of certain difficulties, such as:

- Unequal growth in the different modes of transport. Road now takes 44% of the goods transport market compared with 8% for rail and 4% for inland waterways. On the passenger transport market, road accounts for 79%, air for 5% and rail for 6%;
- Congestion on the main road and rail routes, in cities and at certain airports;
- Harmful effects on the environment and public health and poor road safety.

Economic development combined with enlargement of the European Union could exacerbate these trends.

CONTENT

A/ Road transport

Objectives: To improve quality, apply existing regulations more effectively by tightening up controls and penalties.

Figures: For carriage of goods and passengers, road transport dominates as it carries 44% of freight and 79% of passenger traffic. Between 1970 and 2000, the number of cars in the European Union trebled from 62.5 million to nearly 175 million.

Problems: Road haulage is one of the sectors targeted because the forecasts for 2010 point to a 50% increase in freight transport. Despite their capacity to carry goods all over the European Union with unequalled flexibility and at an acceptable price, some small haulage companies are finding it difficult to stay profitable. Congestion is increasing even on the major roads and road transport alone accounts for 84% of CO₂ emissions attributable to transport.

Measures proposed: **The Commission has proposed:**

- To harmonise driving times, with an average working week of not more than 48 hours (except for self-employed drivers);
- To harmonise the national weekend bans on lorries;
- To introduce a "driver's certificate" making it possible to check that the driver is lawfully employed;
- To develop vocational training;
- To promote uniform road transport legislation;
- To harmonise penalties and the conditions for immobilising vehicles;
- To increase the number of checks;
- To encourage exchanges of information;
- To improve road safety and halve the number of road deaths by 2010;
- To harmonise fuel taxes for commercial road users in order to reduce distortion of competition on the liberalised road transport market.

B/ Rail transport

Objectives: To revitalise the railways by creating an integrated, efficient, competitive and safe railway area and to set up a network dedicated to freight services.

Figures: Between 1970 and 1998 the share of the goods market carried by rail in Europe fell from 21% to 8.4%, whereas it is still 40% in the USA. At the same time, passenger traffic by rail increased from 217 billion passenger/kilometres in 1970 to 290 billion in 1998. In this context, 600 km of railway lines are closed each year.

Problems : The White Paper points to the lack of infrastructure suitable for modern services, the lack of interoperability between networks and systems, the constant search for innovative technologies and, finally, the shaky reliability of the service, which is failing to meet customers' expectations. However, the success of new high-speed rail services has resulted in a significant increase in long-distance passenger transport.

Measures proposed: The European Commission has adopted a second " railway package " consisting of five liberalisation and technical harmonisation measures intended for revitalising the railways by rapidly constructing an integrated European railway area. These five new proposals set out:

- To develop a common approach to rail safety with the objective of gradually integrating the national safety systems;
- To bolster the measures of interoperability in order to operate transfrontier services and cut costs on the high-speed network;
- To set up an effective steering body - the European railway agency - responsible for safety and interoperability;
- To extend and speed up opening of the rail freight market in order to open up the national freight markets;
- To join the intergovernmental organisation for international carriage by rail (otif).

This "railway package" will have to be backed up by other measures announced in the White Paper, particularly:

- Ensuring high-quality rail services;
- Removing barriers to entry to the rail freight market;
- Improving the environmental performance of rail freight services;
- Gradually setting up a dedicated rail freight network;
- Progressively opening up the market in passenger services by rail;
- Improving rail passengers' rights.

C/ Air transport

Objectives: To control the growth in air transport, tackle saturation of the skies, maintain safety standards and protect the environment.

Figures: The proportion of passenger transport accounted for by air is set to double from 4% to 8% between 1990 and 2010. Air transport produces 13% of all CO2 emissions attributed to transport. Delays push up fuel consumption by 6%.

Problems : To sustain such growth, air traffic management will need to be reformed and airport capacity improved in the European Union. Eurocontrol (the European Organisation for the Safety of Air Navigation) is limited by a decision-making system based on consensus.

Measures proposed: Creation of the Single European Sky is one of the current priorities, due to the following measures:

- A regulatory framework based on common rules on use of airspace;
- Joint civil/military management of air traffic;
- Dialogue with the social partners to reach agreements between the organisations concerned;
- Cooperation with eurocontrol;
- A surveillance, inspection and penalties system ensuring effective enforcement of the rules.

Besides this restructuring of the airspace, the Commission wishes to harmonise the qualifications for air traffic controllers by introducing a Community licence for air traffic controllers.

Alongside creation of the single sky, more efficient use of airport capacity implies defining a new regulatory framework covering:

- The amendment of slot allocation in 2003. Airport slots grant the right to take off or land at a specific time at an airport. The commission will propose new rules on this subject ;
- An adjustment of airport charges to encourage the redistribution of flights throughout the day;
- Rules to limit the adverse impact on the environment. The air industry must get to grips with problems such as the noise generated by airports. The European Union must take account of the international commitments entered into within the International Civil Aviation Organisation (ICAO). With this in mind, the European Commission recently adopted a proposal for a directive to ban the noisiest aircraft from airports in Europe. In 2002 the ICAO will have to take specific measures to reduce greenhouse gas emissions. Consideration is also being given to taxes on kerosene and the possibility of applying vat to air tickets;
- Intermodality with rail to make the two modes complementary, particularly when the alternative of a high-speed train connection exists;
- Establishment of a European Aviation Safety Authority (EASA) to maintain high safety standards;
- Reinforcement of passenger rights, including the possibility of compensation when travellers are delayed or denied boarding.

D/ Sea and inland waterway transport

Objectives: To develop the infrastructure, simplify the regulatory framework by creating one-stop offices and integrate the social legislation in order to build veritable "Motorways of the Sea".

Figures: Since the beginning of the 1980s, the European Union has lost 40% of its seamen. By 2006 the Union will be some 36 000 sailors short. For all that, ships carry 70% of all trade between the Union and the rest of the world. Each year, some two billion tonnes of goods pass through European ports.

Problems : Transport by sea and transport by inland waterway are a truly competitive alternative to transport by land. They are reliable, economical, clean and quiet. However, their capacity remains underused. Better use could be made of the inland waterways in particular. In this context, a number of infrastructure problems remain, such as bottlenecks, inappropriate gauges, bridge heights, operation of locks, lack of transshipment equipment, etc.

Measures proposed: Transport by sea and transport by inland waterway are a key part of intermodality, they allow a way round bottlenecks between France and Spain in the Pyrenees or between Italy and the rest of Europe in the Alps, as well as between France and the United Kingdom and, looking ahead, between Germany and Poland.

The Commission has proposed a new legislative framework for ports which is designed:

- To lay down new, clearer rules on pilotage, cargo-handling, stevedoring, etc.;
- To simplify the rules governing operation of ports themselves and bring together all the links in the logistics chain (consignors, shipowners, carriers, etc.) In a one-stop shop.

On the inland waterways, the objectives are:

- To eliminate bottlenecks;
- To standardise technical specifications;
- To harmonise pilots' certificates and the rules on rest times;
- To develop navigational aid systems.

E/ Intermodality (combined transport)

Objectives: To shift the balance between modes of transport by means of a pro-active policy to promote intermodality and transport by rail, sea and inland waterway. In this connection, one of the major initiatives is the "Marco Polo" Community support programme to replace the current PACT (Pilot Action for Combined Transport) programme.

Figures: The PACT programme launched 167 projects between 1992 and 2000. The new "Marco Polo" intermodality programme has an annual budget of 115 million euro for the period between 2003-2007.

Problems : The balance between modes of transport must cope with the fact that there is no close connection between sea, inland waterways and rail.

Measures proposed: The "Marco Polo" intermodality programme, will be open to all appropriate proposals to shift freight from road to other more environmentally friendly modes. The aim is to turn intermodality into a competitive, economically viable reality, particularly by promoting Motorways of the Sea.

F/ Bottlenecks and trans-European networks

Objectives: To construct the major infrastructure proposed in the Trans European Networks (TEN-T) programme, identified by the 1996 guidelines, as well as the priority projects selected at the 1994 Essen European Council .

Figures: Of the 14 projects selected in Essen, three have now been completed and six others, which are in the construction phase, should be finished by 2005.

Problems : The delays in completing the trans-European networks are due to inadequate funding. In the case of the Alpine routes which require the construction of very long tunnels, it is proving difficult to raise the capital to complete them. The Commission has proposed, in particular, completion of the high-speed railway network for passengers, including links to airports, and a high-capacity rail crossing in the Pyrenees.

Measures proposed: The Commission has proposed two-stage revision of the trans-European network guidelines. The first stage, in 2001, was to revise the TEN-T guidelines adopted in Essen to eliminate bottlenecks on the main routes. The second stage in 2004 will focus on Motorways of the Sea, airport capacity and pan-European corridors on the territory of candidate countries. The Commission is looking at the idea of introducing the concept of declaration of European interest where specific infrastructure is regarded as being of strategic importance to the smooth functioning of the internal market.

The priority projects are:

- Completing the Alpine routes on grounds of safety and capacity;
- Making it easier to cross the Pyrenees, in particular, by completing the Barcelona-Perpignan rail link;
- Launching new priority projects, such as the Stuttgart-Munich-Salzburg/Linz-Vienna TGV/combined transport link, the Fehmarn Belt linking Denmark and Germany, improving navigability on the Danube between Straubing and Vilshofen, the Galileo radionavigation project, the Iberian high-speed train network and addition of the Verona-Naples and Bologna-Milan rail links plus extension of the southern European TGV network to Nîmes in France;
- Improving tunnel safety by having specific safety standards for both railway and road tunnels.

On infrastructure funding and technical regulations, the Commission has proposed:

- Changes to the rules for funding the trans-European network to raise the maximum Community contribution to 20%. This would apply to cross-border rail projects crossing natural barriers, such as mountain ranges or stretches of water, as well as to projects in border areas of the candidate countries;
- Establishment of a Community framework to channel revenue from charges on competing routes (for example, from heavy goods vehicles) towards rail projects in particular;
- A directive designed to guarantee the interoperability of toll systems on the trans-European road network.

G/ Users

Objectives: To place users at the heart of transport policy, i.e. to reduce the number of accidents, harmonise penalties and develop safer, cleaner technologies.

Figures: In 2000 road accidents killed over 40 000 people in the European Union. One person in three will be injured in an accident at some point in their lives. The total annual cost of these accidents is equivalent to 2% of the EU's GNP.

Problems : Road safety is of prime concern for transport users. However, spending fails to reflect the severity of the situation. Users have the right to know what they are paying and why. Ideally, the charge for use of infrastructure should be calculated by adding together maintenance and operating costs plus external costs stemming from, for example, accidents, pollution, noise and congestion. Finally, non-harmonisation of fuel taxes is another obstacle to smooth operation of the internal market.

Measures proposed:

On road safety, the Commission has proposed:

- A new road safety action programme covering the period 2002-2010 to halve the number of deaths on the roads;
- Harmonisation of penalties, road signs and blood-alcohol levels;
- Development of new technologies such as electronic driving licences, speed limits for cars and intelligent transport systems as part of the e-europe programme. In this connection, progress is being made on protection of vehicle occupants, on making life safer for pedestrians and cyclists and on improving vehicle-speed management.

On charging for use of infrastructure, the Commission announced that in 2002 it would be proposing:

- A framework directive to establish the principles of infrastructure charging and a pricing structure, including a common methodology to incorporate internal and external costs and aiming to create the conditions for fair competition between modes.
 - (a) In the case of road transport, charges will vary according to the vehicle's environmental performance (exhaust gas emissions and noise), the type of infrastructure (motorways, trunk and urban roads), distance covered, axle weight and degree of congestion.
 - (b) In the case of rail transport, charges will be graduated according to scarcity of infrastructure capacity and adverse environmental effects.
 - (c) In the case of maritime transport, the measures proposed will be linked to maritime safety;
- A directive on the interoperability of toll systems to be put in place on the trans-European road network.

On fuel tax, the Commission has proposed:

- Separating fuel taxes for private and commercial uses (directive on excise duties);
- Establishing harmonised taxation of fuel used for commercial purposes.

Other measures have been proposed to improve intermodality for multimodal journeys, in particular for those using rail and air successively, including integrated ticketing and improvements in baggage handling.

Annex 6 Lessons from the past

History and background

The Marco Polo programme is formally the successor of the PACT (Pilot Actions on Combined Transport) programme, although it is broader in scope, budget and more ambitious. PACT started on 1 January 1997 and came to an end on 31 December 2001. On 4 February 2002, the European Commission has proposed the “Marco Polo” programme (COM 2002(54) final). The Commission had this proposal adopted by the European Parliament and the Council in July 2003. In order to bridge the gap between the two programmes, and to test certain features and ideas of the “Marco Polo” programme, the Commission issued the Mini-Call Catalyst Action 2002.

The Directorate General for energy and transport is now designing the proposal of the Commission for the renewed multiannual Marco Polo II programme for the period 2007-2013. In order to learn from best practices from previous programmes, these programmes are evaluated in this chapter. Most of the attention will be given to the PACT and Marco Polo I programme since the Mini-Call only comprised 3 projects.

The evaluation concerns the following elements:

1. The content of the programmes;
2. The management of the programmes;
3. The impact of the programmes and
4. Lessons from other sources.

Content of the programmes

Overview

The next table gives a brief overview of the different programmes.

	PACT	Mini-Call Catalyst Action 2002	Marco Polo I	Marco Polo II
Period	1997 to 2002	2002	2003 to 2010	2007-2013
Budget	€ 35 million	€ 2 million. The Commission envisages to fund not more than 3 projects under this call	€ 75 million ²⁹ for EU-15 and € 100 million for EU-25 for programme duration	Annual budget calculated at some € 120 million ³⁰ per year
Objectives and eligibility conditions	To give financial assistance to innovative projects which contribute to increased use of combined transport and encourage modal shift (from road to more environmental friendly modes of transport) through: increasing the competitiveness of combined transport promoting the use of advanced technology in combined transport improving the possibilities of supplying combined transport services.	To give financial assistance to Catalyst Actions in the non-road transport market to lead to a modal shift from road to short sea shipping, inland waterways or rail. Actions are to contribute reducing congestion in the road freight transport system and/or to a better environmental performance of the transport system. The action must have an international character (project is situated on the territory of at least two Member States). Catalyst action here means any innovative action aimed at overcoming structural barriers in the market for freight transport which impede the efficient functioning of the markets, the competitiveness of short sea shipping, rail or inland waterways and/or the efficiency of transport chains making use of these modes.	To give financial assistance to actions that reduce road congestion and improve the environmental performance of the freight transport system within the Community and to enhance intermodality. Three types of actions are featured: 1 Modal Shift actions: just shift freight off the road 2 Catalyst actions: to overcome structural market barriers in European freight transport through a highly innovative concept: causing a break-through. 3 Common Learning actions: improvement of co-operation and sharing of know how: Coping with an increasingly complex transport and logistics market.	See Marco Polo I. The programme is not only aiming to contribute to the three type of actions under Marco Polo I but also on: 4 Motorways of the Sea: actions that shift freight from road to short sea shipping, rail, inland waterways or a combination of modes of transport, including the creation of the necessary infrastructure, to timely implement a very large volume, high frequency intermodal transport service. 5 Rail Synergy Action: to implement a rapid, high frequency intermodal transport service using the same transport services and intermodal infrastructure for freight and passenger in order to shift freight from the road to other modes (short sea, rail, inland waterways) 6 Traffic Avoidance Action: integrating production into transport logistics to avoid a large percentage of transport of any mode, including the creation of the necessary infrastructure, including production infrastructure and equipment.

²⁹ Source: 'PACT and Marco Polo', European Commission, DG TREN, Brussels, 2004.

³⁰ See Section 8.2: Assessment of Marco Polo II budget.

Comparison of the Marco Polo I programme with the PACT programme shows that Marco Polo I is broader in scope, it intends to foster modal shift projects in all segments of the freight market, not only in combined transport as it was the case under its predecessor PACT. Also, Marco Polo adds two additional new types of actions: Catalyst and Common Learning Actions. Finally, the number of participating countries has been doubled: commercial enterprises in former accession states (now new Member States), which are scheduled to be joining the EU in 2004, are welcome to participate in the Marco Polo programme.

Both PACT and Marco Polo I are geared towards promoting commercially oriented services in the freight transport market. Infrastructure measures are not the focus of both programmes.

The new Marco Polo II programme will continue the activity started with the Marco Polo I programme, enhance it and include a new dimension: it will provide support to a wider range of countries. The programme shall also be open to participation by the EFTA³¹-countries, all countries on the Mediterranean and Black Sea, the western Balkan countries and Belarus, Ukraine, Moldavia and Russia, on the basis of supplementary appropriations in accordance with procedures to be agreed with those countries³². Under the new Marco Polo II programme it is also possible that the creation of necessary infrastructure is financed for Motorways of the Sea actions, Traffic Avoidance Actions and Rail Synergy Actions.

It can be concluded that in time the strategy of PACT, Marco Polo I (Marco Polo I) and Marco Polo II has slightly changed, it remains however short-term and bottom-up. To give financial assistance is still the core of all three programmes (pull strategy). This financial construction can be classified as a form of Public Private Partnership, combining both public and private funds in one project.

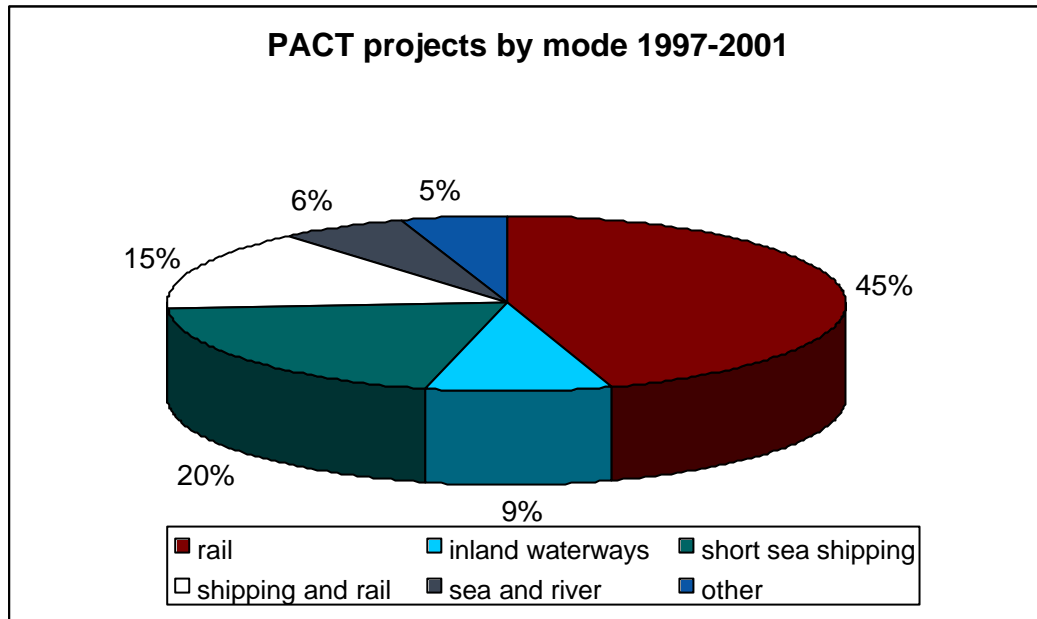
PACT programme

The projects that were funded under the PACT programme by type of project is shown in the next figure. About half of the projects can be characterized as rail projects. Under the PACT programme a total of 92 actions were undertaken. The number of proposals ranged between 60 and 80 each year in the period 1997-1999. This resulted in a supporting rate of 33%.

³¹ EFTA countries: Iceland, Switzerland, Norway and Liechtenstein.

³² Source: 'Amendment (EC) no XXX to the Regulation (EC) No 1382/2003 of the European Parliament and of the council', draft 02-04-2004.

Figure 1 Projects under the PACT programme



In the next table the rail projects have been further analysed. Nearly half of the rail projects concerned the introduction of new combined transport services or intermodal shuttle train services.

Rail projects in PACT by type	
Setting up block train services	8%
Increasing efficiency (at terminals, border stations, optimisation of capacity)	23%
Combined transport service (new links, for specific goods)	31%
Tracking and tracing (train, intermodal)	6%
(intermodal) shuttle train service, including feasibility studies	25%
Other	8%

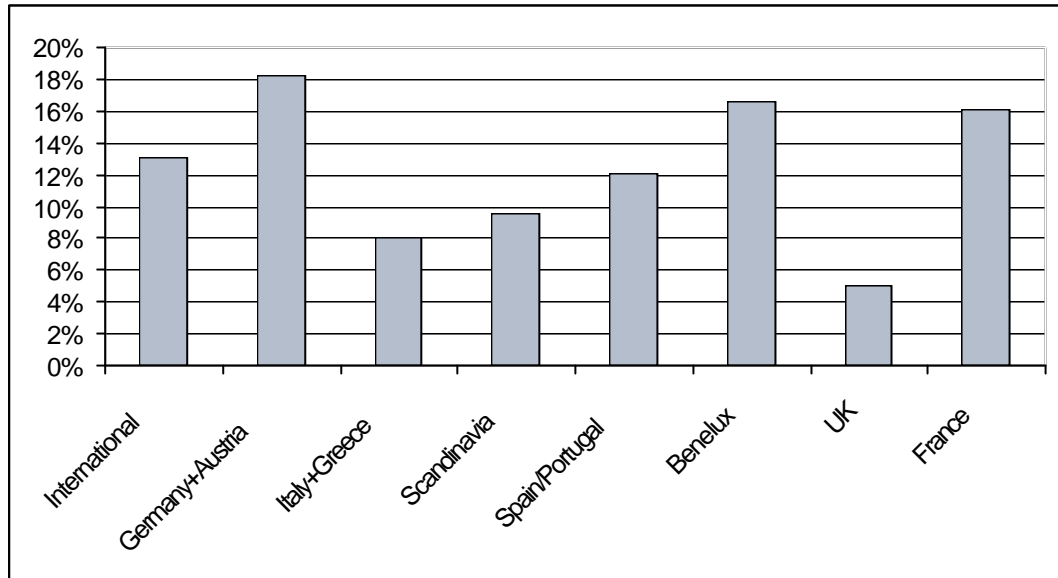
The inland waterway projects comprised in most cases the setting up of new regular (intermodal) barge (container) services. Only three projects had another, a more innovative, character: one of them was the setting up of inland waterway services through mobile terminal segment, another concerned the installation of information technology to increase reliability and the third comprised the installation of innovative transshipment equipment that lowered transshipment prices which in turn led to a new barge service.

The ‘short-sea-shipping’ projects consisted for the greater part (74%) of setting up (intermodal) maritime services or feasibility studies into these new services. Other short-sea-shipping projects comprised a hub and spoke system, introduction of innovative terminal trailers and improving quality in door-to-door logistics.

The ‘Shipping-Rail’ projects mainly concerned the introduction of new rail-sea/barge services. The ‘Sea-River’ projects all comprised the set-up of new sea-river services or feasibility studies to these kind of services.

Lead partner

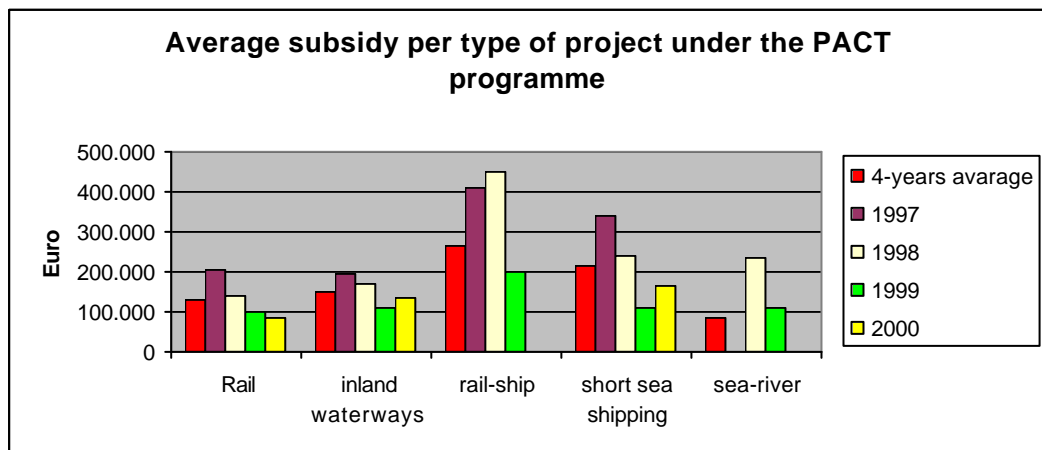
The table below shows the country of the lead partner in each of the projects. It can be concluded that PACTS projects have taken place in each of the EU-15 countries.



Based on the external evaluation, it can also be concluded that PACT was small-scale since more than 60% of the propositions came from SMEs.

Level of support

For projects newly funded between 1997 and 30 September 2001, the PACT programme provided subsidies amounting to 30 million euro. The total volume of all actions funded from 1997 to 2001 amounts to about 120 million euro. The next figure shows the average subsidy per type of action given in each year. It can be concluded that the highest subsidies are for Rail-shipping projects (rail-short sea shipping and rail-inland waterways). The average single subsidy was around 200.000 euro in 1999 to 470.000 in 2001.



Source: 'Results of the Pilot Actions for Combined Transport (PACT Programme) 1997-2001. Status: 30 September 2001', European Commission.

Mini-Call Catalyst Action 2002

Under the Mini-Call Catalyst Action 2002 only three transport actions are funded: 2 short sea shipping projects (a shipping link and a frequent ferry service) and 1 rail project (an intermodal rail service). A total of 28 proposals were received of which 10 achieved all the thresholds laid down in the call.

Marco Polo I programme

Because the Marco Polo I programme has just started only information for one year (Call 2003) regarding the projects recommended for funding is available. Call 2003 resulted in 92 proposals of which 13 have been qualified as recommended projects. If corrections are made for the project that did not meet the requirements (5), this means a supporting rate of 15%. PACT supported about 33% of all bids, i.e. a significant drop in the supporting rate has resulted. Of the 13 recommended projects, one project is a Common Learning Action (8%), all the other projects are Modal Shift Actions (92%). No Catalyst Action projects are recommended for funding. The next table shows the modal shift actions by mode.

Table 1 Distribution of Modal Shift Actions proposed for funding by type of mode

Rail	Short sea shipping	Inland waterways	Rail+ river	Sea+river
33%	42%	-	8%	16%

The subsidy offered by the EC (by opening of contract negotiations) for all 13 recommended projects amounts to nearly 15 million euro. This means an average Marco Polo subsidy of around 1 million euro per project. Compared to PACT – where the average single subsidy was around 200.000 euro in 1999 to 470.000 in 2001- this is a considerable increase. This increase results from a minimum subsidy threshold of €1 million per Modal Shift Action, €3 million for Catalyst Actions and €500.000 for common learning type actions.

Financial assistance in Marco Polo I differs according to the type of project and is limited for:

- Modal Shift Action to a maximum subsidy rate of 30%
- Catalyst action to a maximum subsidy rate of 35%
- Common Learning actions to a maximum subsidy rate of 50%.

Management of the programmes

Regarding the management of the programmes, the following aspects are taken into account:

- Accessibility (awareness of programme, assistance for potential bidders, bidding costs, etc.)
- Selection procedure (efficiency)
- Contractual relationships (appropriateness of contractual terms)
- Project monitoring (progress, effectiveness assessment, dissemination etc.)
- Personnel input

PACT programme

With regard to the PACT programme these aspects have been analysed in a mid-term evaluation of the PACT programme³³, covering projects initiated between 1997 and 1999.

Accessibility

Conclusions for the theme accessibility were:

- PACTS programme appears to be well known amongst potential bidders;
- Guidance given by the User's Guide seems in general to be sufficient although occasional misunderstandings have occurred. Encouragement to contact the Commission services at the proposal preparation stage could solve this;
- Level of effort needed to prepare proposals may be quite considerable due to put together consortia and assess combined transport opportunities. It is not due to disproportionate administrative requirements in PACT.

Selection procedure

PACT operated an annual cycle for project selection and contract negotiation. The call for proposals (only one per year) was always in December with a deadline in February. Proposals were assessed by the EC and the Member States representatives, with two selection meetings in May and June. A decision was made by July. Documentation for contract negotiation was sent out in late summer with the whole contract negotiation process completed by 10 December. In addition, the EC staff offered pre-proposal checking at any time throughout the year.

Conclusions regarding the selection procedure are:

- There is a long time interval between bid acceptance and signature of contracts. It would be better to reduce this period.
- Options should also be examined for reducing the period between project acceptance and contract signature (in July formal decision, whole contract negotiation process completed by 10 December) which in the PACT programme was found to be too long to meet the needs of fast moving, near market initiatives
- The selection criteria are well understood. Environmental benefits should perhaps be emphasized more strongly in communications with applicants
- Some applicants and Member States representatives have complained about a lack of transparency in the selection process and a feeling that it is too political.
- The inability to fund Central and Eastern European organizations caused some concern because it was commonly seen as important in alleviating pollution and congestion problems (in the Marco Polo programme this problem is solved).

³³ Evaluation of the Implementation of Council Regulation 2196/98 (PACT), AEA Technology Environment, November 2000.

- Very few examples were found where a PACT project was introduced in direct competition to an existing or planned Combined Transport scheme. The project selection process reduces the threat of this type of market distortion.

Contractual relationships

- The Commission should consider multi-year project approvals instead of single year contracts³⁴, with continued support dependent on meeting specific milestone targets. This would reduce the risk for beneficiaries, reduce project selection costs and provide applicants with a more realistic view of their prospects.
- Evidence suggests that many PACT projects would proceed with less than 30% EC funding (especially the larger projects) and that the 'badge' of EC approval is sometimes as important as the funding given (PACT projects had a size of about 500.000-2.000.000 euro in period 1997-1999).
- The close contractual relationship between the Commission and the beneficiary allows for individualized arrangement to reach the objectives, and produced good results in terms of monitoring and steering of projects. The funding should therefore continue to be based on contracts.

Project monitoring

In PACT project monitoring was maintained through periodic telephone contacts between the Commission and the project leaders, together with annual written reports and occasional site visits and meetings in Brussels. There was also an external mid-term and final evaluation of the programme.

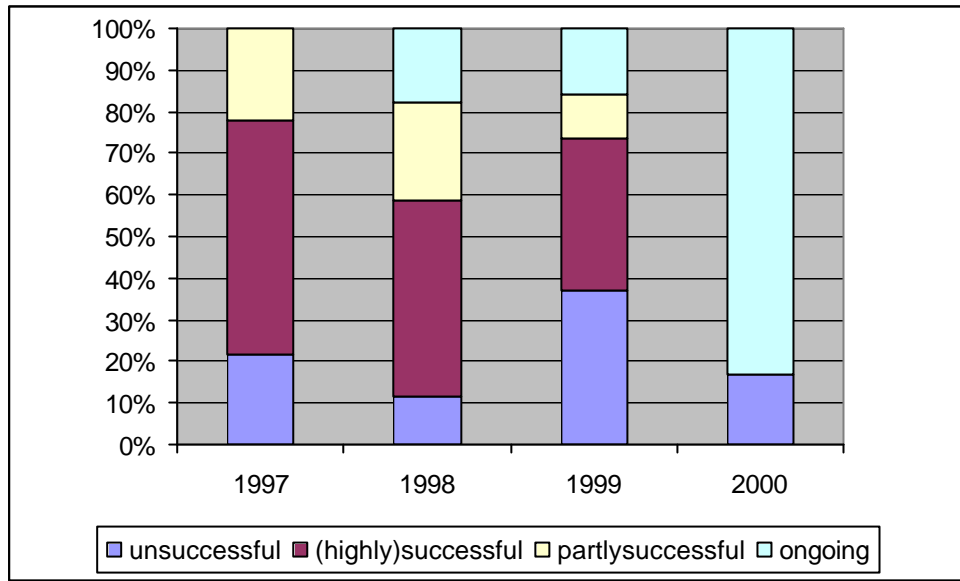
Conclusions regarding the monitoring aspects in the evaluation of PACT were:

- It was recommended to strengthen the dissemination aspects of the promotion programme through the development of a targeted programme-level strategy, which would also encourage more widespread replication of pilot actions;
- Experience from project monitoring is not documented (corporate learning). This should be encouraged in Marco Polo I since it makes the records more transparent and accessible to staff new to the programme;
- In a commission staff working paper³⁵ the different projects under the PACT programme have also been evaluated and classified. The results are visualized in the next figure:

³⁴ Many PACT projects get supported for 3 years, but have to reapply for funding each year.

³⁵ 'Results of the Pilot Actions for Combined Transport (PACT Programme) 1997-2001. Status: 30 September 2001', European Commission.

Figure.2 Classification of the projects under the PACT program



Looking at the overall success rate of the 65 PACT actions technically terminated on 30 September 2001 the percentage is as follows:

(Highly)successful	Partially successful	Unsuccessful
51%	22%	27%

It can be concluded that a quarter of the PACT projects have received the classification unsuccessful. Based on the short evaluation description an analysis has been made of the different reasons for this classification. Also the reasons for projects being classified only partly successful have been taken into account.

Table 2 Reasons mentioned for projects being classified as unsuccessful or partial unsuccessful

Rail	Lack of rail quality (unacceptable transit times, prices too high) → not enough customers (8) Price decreases in competing road modes/ Price increases by the railways/a road competitive service could not be offered (4) Management problems/re-organizations within companies (4) Lack of railway capacity (2) Company insolvent/limited capital base of operator (2) Lack of planning Lack of suitable cargo Acrimonious relationships
Inland waterways	- No (partly) unsuccessful projects
Short Sea Shipping	No commitment from shipowners/road haulage market (2) Operator bankrupt Economic crises in Russia: market for consumer goods collapsed and service was cancelled False planning (delays in production and approval of new equipment)
Shipping-Rail	Bad rail quality (frequencies too low, transit times) (3) Rail service could not be set up No agreement on common strategy Decrease in road prices: project became uncompetitive Needed slots were not available at terminal
Sea-River	No (partly) unsuccessful projects

Source: 'Results of the Pilot Actions for Combined Transport (PACT Programme) 1997-2001. Status: 30 September 2001', European Commission.

It can be concluded that sea-river projects and inland waterway projects so far have not been qualified as being (partly) unsuccessful. It can also be concluded that launching intermodal actions is not risk-free: the commercial success of new intermodal services is not always guaranteed.

In the external evaluation of the PACT programme relevant conclusions with regard to the (un)successfulness of projects are:

- Commercial viability of the intermodal projects is difficult to achieve, even with the start-up support provided by PACT. This is due to the challenging market conditions for combined transport in Europe. External influences like the price of road haulage are very important to the viability of projects;
- Asking for technological or logistics innovation in conjunction with achieving commercial viability under current market conditions may expose projects to inordinate risk and ultimate failure. One should therefore dissociate innovation funding from start-up aid;
- The commitment created by the PACT contract and the political and operational support provided through the programme was essential for reaching the goals of the project;
- Discontinue funding of feasibility studies as precursors to operational projects but allocate some funding to generic studies aimed at market enablement.

Personnel input

No negative comments or recommendations were made with regard to the personnel input.

Marco Polo I programme

Accessibility

There has been a web site including all the information about the programme. How this is 'valuated' by 'the field' is not known. On the first call 92 proposals were registered. This is an increase compared to PACT. It could therefore be concluded that Marco Polo I is well-known since the same conclusion was already made in the external evaluation of the PACT programme.

Selection procedure

Like PACT, the Marco Polo I programme follows an annual cycle of calls and publishes its first call for proposals on 11 October, the deadline being 10 December. Compared to PACT this means a shortening to 2 months for proposal preparation (in PACT it was 3 months, including Christmas holidays). This shortening is not in line with the findings of the external evaluation of PACT that suggested a longer time for proposal preparation. After 5 months the commission makes a funding decision and after 8 months the first contracts are signed. With regard to PACT improvements have been made in weighting and quantifying the various criteria to increase transparency and fairness.

Contractual relationships

The funding in Marco Polo I remains based on contracts. In Marco Polo I both annual and multi-annual projects can be taken into consideration. Compared to PACT this means a reduction in management costs for multi-annual projects since in PACT one had to reapply for funding each year which also increased risks.

Project monitoring

In line with recommendations following the PACT programme Marco Polo I has increased monitoring before and after implementation of successful proposals. Before awarding an EC subsidy contract, the financial data presented for the implementation of the proposed action will be verified by the Commission with the help of an external auditor. Under Marco Polo I record keeping on progress monitoring activities will be encouraged.

The level of project monitoring by the Commission seems quite sufficient bearing in mind the level of funding (20-30%) and the near market nature of projects, which places a high level of motivation on projects to succeed or terminate to avoid unacceptable losses.

The impact of the programmes

The evaluation of the impacts of the PACT and Marco Polo I programme concerns the following elements:

- Modal Shift impact;
- Environmental impact;
- Public awareness/dissemination.

Modal shift impact

PACT programme

The level of detail provided by the PACT beneficiaries in terms of modal shifts, varied significantly across the applications analysed. For both the proposals submitted prior to funding and the reports produced whilst benefiting from funding, modal shift data were often absent or not specified in enough detail. The external evaluation estimates the traffic shift for 34 PACT actions (excluding feasibility studies) between 1997 and 1999 to be a total of at least 3.5 billion tonne-kms. If those 34 projects are representative, the total traffic shift from the PACT programme is around 2.2 billion tonne-kms per year of funding (conservative estimate).

Marco Polo I programme

Based on the evaluation of the PACT programme actions have been taken to avoid making the same mistakes twice. In the Annex of the Call for proposals for Marco Polo I it is described what information must be provided: the effected modal shift in tonne-kilometres.

Under the Marco Polo I programme –Call 2003 13 projects are recommended for funding. Together they aim at shifting a total of 13.7 billion tonne-kms. Taking into account the time period of the projects (average project last around 31 months) this amounts to 5.2 billion tonne-kms/year.

Environmental impact

PACT programme

The lack of data concerning modal shift impacts of the different PACT project created problems for analysis of the environmental benefits of PACT. This has led to two recommendations:

- The Commission needs to specify data requirements in a form that the beneficiaries understand, and preferable are already familiar with;
- The Commission needs to ensure that beneficiaries provide the data.

Nevertheless it is concluded that most operational measures supported by the PACT programme are cost-effective in terms of avoided carbon dioxide (CO₂) emissions.

Marco Polo I programme

Besides a description of how to calculate the number of tonnes-kilometres that shifts from road to alternative modes, also a description is given of how to determine environmental benefits (quantitative and qualitative), including a valuation of external costs per mode of transport. Also the environmental efficiency must be calculated (what are the benefits for society for each euro spent). Analysis of the Call 2003 of Marco Polo learns that the average environmental benefits are estimated at 15 euro for 1 euro of EC-subsidy.

Public awareness/dissemination

PACT programme

The External Evaluation concluded that to maximize cost effectiveness of Community funding, stronger dissemination mechanisms should be integrated into the future programme. In PACT the replication of good modal shift ideas was limited. The main reason was that the supported action was conducted in the core business of the beneficiary. The latter thus did not have a strong interest in replication by other companies. Another reason is that here was no programme-level dissemination strategy.

Marco Polo I programme

It is too soon to make conclusions regarding public awareness/dissemination of the Marco Polo I programme.

Lessons from other sources

Not only on a European scale are efforts made to improve the environmental performance of the freight transport system, but also in the individual countries efforts are made by introducing special programmes. In this part an overview is given of these programmes. This overview does not pretend that it is complete; for this more time is needed. The information of this chapter is based on two reports: 'Inventory on the State of the Art', EUTP II and 'Evaluatie Transportbesparing – eindrapport-', KPMG-BEA, December 2002 (in English: evaluation transport reduction – final report) and on information found on different websites of the countries.

Austria

The largest transport programme in Austria to 2002 is LOGISTIK AUSTRIA. Among the activities can be mentioned automated intermodal communication and information flows, planning and control systems for intermodal freight and design of an innovative logistics service centre.

In 1999 the MOVE programme was launched. The overall goal of MOVE is to enhance innovative activities that improve the resource efficiency of transport and facilitate the use of environmentally friendly modes of transport. One of the targets aims to enhance intermodal freight transport. A programme management committee coordinates the project funding and monitors the implementation of selected projects.

Finland

The KETJU programme (1998-2002) seeks to develop Finnish expertise related to the intermodal transport chain. The programme addressed the logistics related industry, the provision of services, the use of services, research and training, transfer equipment and EDI. In three years 40 projects were launched and 50 organizations participated.

FITS, starting in 2001, has the objective to facilitate the establishment of telematic services in private and public sector for example tracking and tracing of deliveries and telematics in terminals.

France

One of the main research programmes in France for innovation in land transport research is the PREDIT programme. By stimulating cooperation between public and private sector, this programme aims at encouraging the creation of transportation systems that would be economically and socially more effective, safer, more energy saving, and finally more respectful of Man and environmentally-friendly. There have been three PREDIT programmes since 1990, the third programme runs from 2002 to 2006. This third programme has been given about 300 million euro in public funds. Compared to PACT and Marco Polo this programme is mainly focused on research and not so much on implementing 'real' projects.

The Netherlands

A programme comparable to part of the Marco Polo II programme is the project Transport reduction in The Netherlands. This project was introduced in 1998. In this project several organizations are involved: several Dutch Ministries (Transport, Environment, Economic Affairs), the shipper-organisation EVO, the Foundation Nature and Environment and the employers organisation VNO-NCW. Transport reduction is a programme to reduce the transport of goods without impeding economic growth. The programme seeks to cut the number of tonne and volume kilometres by improving products and processes. It is not intended for logistical improvements. For 2004 the available budget amounts to 1,4 million euro, about the same as for the years 2003 and 2002.

Three types of projects qualify for grants. They are feasibility studies (to determine the possible viability of transport reduction), demonstration projects (actual transport reduction projects) and knowledge transfer projects (consciousness-raising project, only to be performed by branch organisations). The programme makes a distinction between two clusters of measures, i.e.:

1. Reduction of volume and/or weight; and
2. Reduction of the distance over which goods must be moved by making changes to production.

Criteria to determine if a project is eligible for subsidy under the transport reduction programme are:

1. Environmental effect: what are the positive effects for the environment and how much transport is prevented
2. Innovative elements: is the project new for The Netherlands
3. Possibility of succeeding: here is looked at the technical, economical and organizational aspects

4. Applicability (spin-off): can it be used in other companies/branches as well.

Projects are ranked on the above-mentioned criteria by an advisory board.

Projects under the Transport reduction programme

The table below gives an overview of the different projects during the years 2000, 2001 and 2002.

	2000	2001	2002
Number of projects	19	18	15
Average subsidy per project (euro)	69.000	47.000	66.000
Type of project:			
• Feasibility studies		29	
• Demonstration projects		21	
• Knowledge transfer projects		1	
Measures taken:			
• Reduction volume		31	
• Reduction kilometres		14	
• Reduction volume and kilometres		5	
• Reduction by other means		1	

Source: 'Evaluatie Transportbesparing – eindrapport-', KPMG-BEA, December 2002 (in English: evaluation transport reduction – final report)

Most of the projects concern feasibility studies and demonstration projects. In most of the cases transport reduction is realized by reducing volume, next in row are projects that reduce the number of kilometres. Reduction of both kilometres and volumes is done in 5 projects. Only 1 project uses transfer of knowledge to achieve transport reduction.

Management of Transport reduction

Bases on the external evaluation of the Transport reduction programme the following conclusions, relevant for this part 'lessons from the past' are drawn:

- Communication regarding possibilities for subsidy is judged to be of great importance (information, documentation, quick responses to questions asked);
- Procedures must not take too long;
- (external) Subsidy advisory organizations are of great help (less time consuming, less drop outs);
- The main reasons to join the transport reduction programme are the costs;
- Especially the feasibility studies would not have been performed without the subsidy.
- To get spin-off the case studies must be very specific: other companies must recognize their possibilities in order to be able to apply them.
- The project Transport reduction has not lead to behavioural changes within companies (with regard to transport)

Impact of the program

1. Modal Shift impact
2. Environmental impact
3. Public awareness

Modal Shift impact

In the case of demonstration projects, companies have to indicate before the start of the project what amount of reduction they expect to achieve.

The actual amount of transport reduction that has resulted from the project is however hard to establish due to the following facts:

- The actual, realized amount of transport reduction is not registered and therefore unknown. Only the indications made previous to the start of the project are available.
- The indicators used to estimate the amount of transport reduction that is expected to be achieved (before the start of the project) differ between the different applications. This makes it impossible to make a quantitative estimate of the effectiveness of the project.
- Feasibility studies that result in negative conclusions, i.e. the project is not feasible, will not lead to transport reduction but the conclusion definitively has a function, although it does not contribute to the objective of the transport reduction project.

It is therefore not possible to give an estimate of the modal shift impact of the project transport reduction in The Netherlands. For the future it is recommended to set targets: what is the amount of tonne-kms reduction that a project is aiming to achieve.

Environmental impact

Because the modal shift impact is unknown, it is also not possible to calculate possible environmental impacts

Public awareness

The results of the different projects could be communicated much better to the outside world.

Germany

In Germany the programme 'Flexible Transport Chain' is to reduce road transport 100 million truck km/year through the creation of a more efficient transport sector and through the use of intelligent transport systems and technologies. This programme had 16 large demonstration projects in 2001.

Terminal infrastructure can be financed by the German state as a part of the infrastructure investments with the aim of creating an extensive intermodal network and avoiding that operators focus on only a few main corridors. The Ministry of Transport subsidises the construction and purchase of handling equipment. Consortias can apply to build and operate the terminal and applications are evaluated by a group of experts from the public and private sector who estimates freight volumes, operational relations and terminal location.

The programme ISETEC has contributed with 36 million euro to develop the ports and in particular port community systems (for example advanced marine terminal intermodal container-handling technologies).

In the summer of 2001 EURIFT was founded, a competence centre for intermodal transport. Main issues are in a first step the collection of data which will finally broaden the knowledge about intermodal transport. In a second larger phase applications will be developed which will in the end be transferred into services for the founders and other customers. For the first three years funds of up to 2,2 million euro are available, afterwards the centre is to be self-sustained.

Sweden

In Sweden regional support is given to the establishment of transport centres and intermodal terminals

Switzerland

In Switzerland two research projects (IRE and Mecop) have analysed the potential and the bottlenecks for intermodal transport in the alp region. The opening hours of intermodal terminals were found very critical. Intermodality cannot further be expanded to the north except if a night ban is imposed on road traffic. Also a great influence on the behaviour of operators is seen in the imposed HVF (Heavy Vehicle Fee) which was introduced from January 2001. Heavy goods (road) transport is to pay not only for infrastructure but also for external costs. Two thirds of the revenue from the fee go the modernization of the Swiss rail system, the rest is used for infrastructure improvements.

United Kingdom

In the United Kingdom there are grants available to help shift freight of the road to rail. Two types of grants are available to help meet the extra costs generally associated with moving freight by rail in order to achieve environmental and social benefits. Grants are made towards the capital costs of rail freight handling facilities (FFG, since 1975/1976) or track access charges (TAG, since 1996/1997).

Annual monitoring of rail traffic passing through a grant-aided facility (FFG) is required. The funding authority verifies the tonnage reported with the goods service operator, and may require repayment if traffic does not reach anticipated levels. TAG is paid in arrears, against freight quantities independently certified by the track authority.

FFG applications must include 'soundly bases predictions of the type and quantities of goods that would use the proposed facility', to show that the freight would otherwise go by road. For both type of grant, a detailed framework is provided for the estimation of costs. The financial assessment offsets revenues against costs, and grant is paid against the shortfall on the (negative) Net Present Value for the scheme.

The volume of traffic moved as a result of grant support, both FFG and TAG was in 2002 at its highest level since recording began, totalling over 9.6 million tonnes of bulk, 961.000 containers and 189.000 automotives.

In the year ending March 2002, 23 offers of FFG were formally accepted with a total value of just over £35 million. This results in an average grant per project of 2,3 million euro. The average grant was 67% of the capital costs, with a range from 35-80%. These grants will save around 2.7 million lorry journeys, and an estimated 554 million lorry kilometres over the next five to ten years. This results in a UK-subsidy per lorry-kilometre shifted of 0,06 pounds or 0,09 euro.

Between 1 February 2001 and 31 March 2002, 21 formal offers of TAG were made, all of which have been accepted. The total value of these grants is around £8 million (this is around a grant of 570.000 euro per project) and they will remove around 1 million lorry journeys (219 million lorry kilometres) from UK roads, i.e. a grant of 0,04 pounds (0,06 euro) per lorry kilometre shifted. In the period 2002/2003 the TAG grant amounted to 0,08 pounds (0,12 euro) per lorry kilometre shifted.

An independent review of the TAG scheme was conducted covering the period from its inception to May 2003. The aim of the study was to review the performance of the TAG scheme and to conclude on how effective it had been at meeting its original objectives. The study also considered areas for improvement. The headline conclusions from the review are:

- TAG is effective at the tactical level in supporting the transfer of freight to rail.
- TAG represents value for money.
- The scheme is efficiently administered.
- The scheme should be reviewed again in the future once the new track access charges structures have been fully implemented.
- Small changes to the economic methodology should be implemented.

A review and update of the economic methodology for FFG and TAG is near completion. More information can be found on the website of the SRA (http://www.sra.gov.uk/publications/annual_report).

Summary and lessons learned

Strategy

- In time the strategy of PACT, MP I and MP II has slightly changed. To give financial assistance is still the core of all three programmes. This financial construction can be seen a Public Private Partnership; combining both private and public funds to realise a project;
- The type of initiatives that can receive financial assistance has broadened in time. In PACT only combined transport actions are supported, in MP II this has evolved into 6 types of actions of which 5 can be characterized as Modal Shift Actions, the other is aimed at transport reduction;
- The strategy remains short-term and bottom-up;
- The goals of PACT have not been quantified, in MP I and MP II one goal be quantified (indirectly), the others not. The lack of quantifiable, measurable and viable goals makes it difficult, if not impossible, to determine the effectiveness of a programme;

- The Commission does not systematically monitor the longer-term viability of PACT projects. In order to preserve and maintain the successfulness of similar programmes, projects should be monitored for a much longer time (and in a more structured way).

Efficiency in tonne-kilometre shifted off the road

To compare the efficiency (EU subsidy per tonne-kilometre shifted off the road) of the PACT and Marco Polo I programme the following table has been constructed:

	PACT	Marco Polo I
Shift in tonne-kilometres	11 billion in 5 years	13.65 billion (6.83 billion)*
EU-subsidy	30 million in 5 year	14.94 million
Tonne-kilometre shifted per euro	367	914 (457)*

* If a success rate of 50% is applied, modal shift is reduced from 13.65 to 8.83 and tonne-kilometre shift per euro is reduced from 914 to 457 (see also Section 10.27 cost effectiveness).

Remarks based on the above:

- The PACT figures are based on completed projects, reflecting actual tonne-kilometre shift. Marco Polo figures are based on ongoing projects of which some may fail (see next bullet).
- Marco Polo I figures only refer to the first 2003 Call. Total Marco Polo I budget (2003-2006) is estimated at 75 million euro for EU-15, 100 million euro for EU-25. As Marco Polo I projects are ongoing and some projects may not be successful, the tonne-kilometre shift should be adjusted by applying a success rate. Based on a success rate of 50 percent, total tonne-kilometre shift would amount to 457.
- It can be concluded that the tonne-kilometres shifted off the road per euro has increased in Marco Polo I compared to PACT, highlighting the increased efficiency of Marco Polo I, as compared to PACT.

Effectiveness: PACT and Marco Polo I contribution to shift in international road freight

The table below indicates the contribution of PACT and Marco Polo I in shifting international road freight off the road.

	PACT	Marco Polo I
(Expected) result: shift in tonne-kilometres	11 billion in 5 years	13.65 billion (only first call in 2003)
Increase in international road transport (tonne-kilometres)	Period 1997 – 2001 (5 years period): 58	2003-2006 (4 years period): 48
Annual % contribution of the programmes	19%	>100% (only based on first call)

Remarks based on the above:

- The expected result in tonnes shifted is based on the Marco Polo I first call (2003).
- For PACT the increase in international freight transport is based on EU-15 average annual increase figures in the period 1998-2013, i.e. 186 billion tonne-kilometres /16 year equalling 11.6 billion tonne-kilometres /year.
- For Marco Polo I the increase in international freight transport is based on an average increase in international road transport of 12.0 billion tonne-kilometres /year.

- Marco Polo I (first call) is more effective than PACT (>100% vs. 19%), reflecting the different ambition levels of the two programmes.
- Based on the results of the first call and the expected total Marco Polo I budget, Marco Polo I could be in a position to deliver the objective in terms of shifted tonne-kilometres off the road for the entire programme duration.

Summary PACT programme

- 92 actions were undertaken under the PACT programme;
- About half of them are rail projects;
- Almost half of the projects offered solely or predominantly a new route. Only a small number of projects were primarily focused on technological innovation;
- The average single subsidy was around 200.000 euro in 1999 to 470.000 in 2000;
- The PACT programme was managed very efficiently;
- Technical innovation made commercial viability more difficult to achieve;
- Due to intense competition within the road sector (reducing prices) and the low reliability/speed of combined transport the viability of any new combined transport project is influenced. Commercial viability is therefore difficult to achieve;
- The PACT programme did not provide the instruments to help overcome structural deficiencies in the market: it did not attack core problems of running efficient transport chains;
- The total traffic shift due to PACT is estimated at around 2.2 billion tonne-kms per year of funding;
- PACT is cost-effective in terms of avoided carbon dioxide emissions;
- Projects are not adequately disseminated in support of programme objectives such as replication and policy assessment.

Based on the external evaluation, recommendations following the PACT programme are:

- Provide some additional time for proposal preparation.
- The commission needs to specify data requirements in order to be able to determine modal shift impacts and analysis of environmental benefits. The Commission must also ensure that these data are provided;
- Allow multi-year project approvals as well as single year contracts;
- It may be better to invite technology-only or route-only innovations rather than a combination of both;
- Improve dissemination of PACT;
- Improve monitoring of impacts, including project follow-up for a 3-year period (provide evidence to stimulate replication in the market);
- Introduce more structured project monitoring procedures (but avoid unnecessary bureaucracy).

Summary Marco Polo I programme:

- Because the programme has just started only one Call –Call 2003- was made so far under the Marco Polo I programme;
- Of the 13 recommend projects for subsidy all but one are Modal Shift Actions;
- The average single subsidy was around 1 million euro in 2003;
- The 13 recommended projects for funding aim at shifting a total of 13.7 billion tonne-kms. Taking into account the time period of the project this amounts to 5.2 billion tonne-kms/year;

- Average environmental benefits are estimated at 15 euro for 1 euro of EC-subsidy;
- Good notice has been taken of the evaluation of the PACT programme and the Marco Polo I programme has been adapted in such a way that most of the findings and recommendations from PACT have been implemented.

Recommendations following the Marco Polo I programme:

- Marco Polo I (first call) supports only 15% of all proposals. This is considered to be a very low percentage and should be increased in the future.

Summary Transport reduction

- Two clusters of measures exist in order to reduce the transport of goods: reduction of volume and/or weight and reduction in distances travelled;
- Most of the projects concern feasibility studies (57%) followed by demonstration projects (41%);
- The average subsidy amounted from 69.000 euro in the year 2000 to 47.000 euro in 2001 and 66.000 euro in 2002;
- To get spin-off, the case studies must be very specific: other companies must recognize their possibilities in order to be able to apply them;
- The resulting modal shift impact from the project is unknown, the same accounts for the environmental impacts.

Based on the external evaluation recommendations following the Transport reduction programme are:

- Set targets: what is the amount of tonne-kms reduction that a project is aiming to achieve;
- More systematic monitoring of the projects;
- Improve dissemination of the results;
- Give more attention to knowledge transfer projects as they play an important role in the raising of consciousness and behavioural changes;
- Stimulation of innovative projects needs good guidance during the preparation of proposals and the providing of assistance to project leaders.

Summary Freight Facilities Grant (FFG)/Access Grant (TAG)

- The average grant towards the capital costs of rail freight handling costs (FFG) per project was 2,3 million euro (2001/2002). This average grant was 67% of the capital costs. These grants saved around 554 million lorry km over the next 5 to 10 years, i.e. a subsidy per lorry-km shifted of 0,09 euro;
- The average grant for Track access charges (TAG) was around 570.000 euro (2001/2002) per project. These grants saved around 219 million lorry km, i.e. a grant of 0,06 euro per lorry-km shifted. In the next year the grant increased to 0,12 euro per lorry-km shifted.

Based on an external evaluation regarding the TAG scheme two main conclusions are:

- TAG is effective in supporting the transfer of freight to rail;
- TAG represents value for money.

Annex 7 Budget calculation-parameters

Base case-part 1

Number of calls= 7

	MP-I	Minimum Threshold MP- II	Expected	Number/year	2007-2013	TKM-shift (billion)	Success rate	TKM-shift (billion)	Share in objective
Modal Shift	787.122.047			18	126	76,7		57,5	40%
TP1 = rail	606.668.277	500.000.000	550.000.000	9	63	34,7	75%	26,0	18%
TP2 = short sea	1.084.036.691	500.000.000	700.000.000	6	42	29,4	75%	22,1	15%
TP3 = rail-river-short sea	733.240.644	500.000.000	600.000.000	3	21	12,6	75%	9,5	7%
Catalyst	845.937.744			6	42	31,5		23,6	16%
TP1 = rail			750.000.000	2	14	10,5	75%	7,9	5%
TP2 = iww			750.000.000	2	14	10,5	75%	7,9	5%
TP3 = sss			750.000.000	2	14	10,5	75%	7,9	5%
Common Learning				6	42	0,0		0,0	0%
TP1				3	21	0,0	75%	0,0	0%
TP2				3	21	0,0	75%	0,0	0%
Motorway of the Sea	2.603.303.940			6	42	84,0		42,0	29%
TP1 = new sss-terminal (sss+rail)		2.000.000.000	2.000.000.000	2	14	28,0	50%	14,0	10%
TP2 = new inland terminal (sss+iww)		2.000.000.000	2.000.000.000	2	14	28,0	50%	14,0	10%
TP3 = upgrading existing port (sss+rail/iww)		2.000.000.000	2.000.000.000	2	14	28,0	50%	14,0	10%
Integrated Freight-Passenger	3.000.000.000			6	42	21,0		10,5	7%
TP1 = upgrading railinfra (rail)		500.000.000	500.000.000	1	7	3,5	50%	1,8	1%
TP2 = integrated freight-pax		500.000.000	500.000.000	1	7	3,5	50%	1,8	1%
TP3 = the last mile		500.000.000	500.000.000	4	28	14,0	50%	7,0	5%
Traffic Avoidance				5	35	17,5		10,5	7%
TP1 = new machine		500.000.000	500.000.000	2	14	7,0	60%	4,2	3%
TP2 = relocation of DC		500.000.000	500.000.000	2	14	7,0	60%	4,2	3%
TP3 = rearrangement of logistics chain		500.000.000	500.000.000	1	7	3,5	60%	2,1	1%
TOTAL				47	329	230,7		144,1	100%

Base case-part 2

TKM/EUR - ratio= 500

Infra funding = 35%

Total services cost (mio EUR)	Infrastructure cost/project (mio EUR)	Total infrastructure cost (mio EUR)	max funding infrastructure	Total costs (mio EUR)	Share in costs	Total EC Subsidy request (mio EUR)	Share in EC subsidy
153,3				153,3	11%	153,3	19%
69,3						69,3	
58,8						58,8	
25,2						25,2	
63,0		318,9	111,6	381,9	26%	174,6	21%
21,0	7,6	106,3	37,2			58,2	
21,0	7,6	106,3	37,2			58,2	
21,0	7,6	106,3	37,2			58,2	
15,2				15,2	1%	15,2	2%
7,6						7,6	
7,6						7,6	
168,0		432,5	151,4	600,5	41%	319,4	39%
56,0	15,5	217,0	76,0			132,0	
56,0	7,6	106,3	37,2			93,2	
56,0	7,8	109,2	38,2			94,2	
42,0		176,5	61,8	218,5	15%	103,8	13%
7,0	10,4	72,7	25,5			32,5	
7,0	7,0	49,0	17,2			24,2	
28,0	2,0	54,7	19,2			47,2	
35,0		53,9	18,9	88,9	6%	53,9	7%
14,0	0,8	11,5	4,0			18,0	
14,0	2,7	38,3	13,4			27,4	
7,0	0,6	4,2	1,5			8,5	
476,5		981,9	343,7	1458,3	100%	820,1	100%

Alternative I-part 1

Number of calls= 7

	MP-I	Minimum Threshold MP- II	Expected	Number/year	2007-2013	TKM-shift (billion)	Success rate	TKM-shift (billion)	Share in objective
Modal Shift	787.122.047			9	63	38,5		28,9	20%
TP1 = rail	606.668.277	500.000.000	550.000.000	4	28	15,4	75%	11,6	8%
TP2 = short sea	1.084.036.691	500.000.000	700.000.000	3	21	14,7	75%	11,0	7%
TP3 = rail-river-short sea	733.240.644	500.000.000	600.000.000	2	14	8,4	75%	6,3	4%
Catalyst	845.937.744			8	56	42,0		31,5	21%
TP1 = rail			750.000.000	3	21	15,8	75%	11,8	8%
TP2 = iww			750.000.000	3	21	15,8	75%	11,8	8%
TP3 = sss			750.000.000	2	14	10,5	75%	7,9	5%
Common Learning				6	42	0,0		0,0	0%
TP1				3	21	0,0	75%	0,0	0%
TP2				3	21	0,0	75%	0,0	0%
Motorway of the Sea	2.603.303.940			8	56	112,0		56,0	38%
TP1 = new sss-terminal (sss+rail)		2.000.000.000	2.000.000.000	3	21	42,0	50%	21,0	14%
TP2 = new inland terminal (sss+iww)		2.000.000.000	2.000.000.000	3	21	42,0	50%	21,0	14%
TP3 = upgrading existing port (sss+rail/iww)		2.000.000.000	2.000.000.000	2	14	28,0	50%	14,0	9%
Rail Synergy	3.000.000.000			7	49	24,5		12,3	8%
TP1 = upgrading railinfra (rail)		500.000.000	500.000.000	1	7	3,5	50%	1,8	1%
TP2 = integrated freight-pax		500.000.000	500.000.000	2	14	7,0	50%	3,5	2%
TP3 = the last mile		500.000.000	500.000.000	4	28	14,0	50%	7,0	5%
Traffic Avoidance				9	63	31,5		18,9	13%
TP1 = new machine		500.000.000	500.000.000	3	21	10,5	60%	6,3	4%
TP2 = relocation of DC		500.000.000	500.000.000	3	21	10,5	60%	6,3	4%
TP3 = rearrangement of logistics chain		500.000.000	500.000.000	3	21	10,5	60%	6,3	4%
TOTAL				47	329	248,5		147,5	100%

Alternative I-part 2

TKM/EUR - ratio= 500

Infra funding = 35%

Total services cost (mio EUR)	Infrastructure cost/project (mio EUR)	Total infrastructure cost (mio EUR)	max funding infrastructure	Total costs (mio EUR)	Share in costs	Total EC Subsidy request (mio EUR)	Share in EC subsidy
77,0				77,0	4%	77,0	8%
30,8						30,8	
29,4						29,4	
16,8						16,8	
84,0		425,2	148,8	509,2	28%	232,8	24%
31,5	7,6	159,5	55,8			87,3	
31,5	7,6	159,5	55,8			87,3	
21,0	7,6	106,3	37,2			58,2	
15,2				15,2	1%	15,2	2%
7,6						7,6	
7,6						7,6	
224,0		594,2	208,0	818,2	44%	432,0	44%
84,0	15,5	325,5	113,9			197,9	
84,0	7,6	159,5	55,8			139,8	
56,0	7,8	109,2	38,2			94,2	
49,0		225,5	78,9	274,5	15%	127,9	13%
7,0	10,4	72,7	25,5			32,5	
14,0	7,0	98,1	34,3			48,3	
28,0	2,0	54,7	19,2			47,2	
63,0		87,2	30,5	150,2	8%	93,5	10%
21,0	0,8	17,2	6,0			27,0	
21,0	2,7	57,5	20,1			41,1	
21,0	0,6	12,6	4,4			25,4	
512,2		1332,1	466,2	1844,3	100%	978,4	100%

Alternative II-part 1

Number of calls= 7

	MP-I	Minimum Threshold MP- II	Expected	Number/year	2007-2013	TKM-shift (billion)	Success rate	TKM-shift (billion)	Share in objective
Modal Shift	787.122.047			29	203	122,9		92,1	72%
TP1 = rail	606.668.277	500.000.000	550.000.000	15	105	57,8	75%	43,3	34%
TP2 = short sea	1.084.036.691	500.000.000	700.000.000	9	63	44,1	75%	33,1	26%
TP3 = rail-river-short sea	733.240.644	500.000.000	600.000.000	5	35	21,0	75%	15,8	12%
Catalyst	845.937.744			9	63	47,3		35,4	28%
TP1 = rail			750.000.000	3	21	15,8	75%	11,8	9%
TP2 = iww			750.000.000	3	21	15,8	75%	11,8	9%
TP3 = sss			750.000.000	3	21	15,8	75%	11,8	9%
Common Learning				9	63	0,0		0,0	0%
TP1				5	35	0,0	75%	0,0	0%
TP2				4	28	0,0	75%	0,0	0%
Motorway of the Sea	2.603.303.940			0	0	0,0		0,0	0%
TP1 = new sss-terminal (sss+rail)		2.000.000.000	2.000.000.000	0	0	0,0	50%	0,0	0%
TP2 = new inland terminal (sss+iww)		2.000.000.000	2.000.000.000	0	0	0,0	50%	0,0	0%
TP3 = upgrading existing port (sss+rail/iww)		2.000.000.000	2.000.000.000	0	0	0,0	50%	0,0	0%
Rail Synergy	3.000.000.000			0	0	0,0		0,0	0%
TP1 = upgrading railinfra (rail)		500.000.000	500.000.000	0	0	0,0	50%	0,0	0%
TP2 = integrated freight-pax		500.000.000	500.000.000	0	0	0,0	50%	0,0	0%
TP3 = the last mile		500.000.000	500.000.000	0	0	0,0	50%	0,0	0%
Traffic Avoidance				0	0	0,0		0,0	0%
TP1 = new machine		500.000.000	500.000.000	0	0	0,0	60%	0,0	0%
TP2 = relocation of DC		500.000.000	500.000.000	0	0	0,0	60%	0,0	0%
TP3 = rearrangement of logistics chain		500.000.000	500.000.000	0	0	0,0	60%	0,0	0%
TOTAL				47	329	170,1		127,6	100%

Alternative II-part 2

TKM/EUR - ratio= 500

Infra funding = 35%

Total services cost (mio EUR)	Infrastructure cost/project (mio EUR)	Total infrastructure cost (mio EUR)	max funding infrastructure	Total costs (mio EUR)	Share in costs	Total EC Subsidy request (mio EUR)	Share in EC subsidy
245,7				245,7	29%	245,7	46%
115,5						115,5	
88,2						88,2	
42,0						42,0	
94,5		478,4	167,4	572,9	68%	261,9	49%
31,5	7,6	159,5	55,8			87,3	
31,5	7,6	159,5	55,8			87,3	
31,5	7,6	159,5	55,8			87,3	
22,8				22,8	3%	22,8	4%
12,6						12,6	
10,1						10,1	
0,0		0,0	0,0	0,0	0%	0,0	0%
0,0	15,5	0,0	0,0			0,0	
0,0	7,6	0,0	0,0			0,0	
0,0	7,8	0,0	0,0			0,0	
0,0		0,0	0,0	0,0	0%	0,0	0%
0,0	10,4	0,0	0,0			0,0	
0,0	7,0	0,0	0,0			0,0	
0,0	2,0	0,0	0,0			0,0	
0,0		0,0	0,0	0,0	0%	0,0	0%
0,0	0,8	0,0	0,0			0,0	
0,0	2,7	0,0	0,0			0,0	
0,0	0,6	0,0	0,0			0,0	
363,0		478,4	167,4	841,3	100%	530,4	100%

Alternative III-part 1

Number of calls= 7

	MP-I	Minimum Threshold MP- II	Expected	Number/year	2007-2013	TKM-shift (billion)	Success rate	TKM-shift (billion)	Share in objective
Modal Shift	787.122.047			53	371	226,1		113,1	78%
TP1 = rail	606.668.277	500.000.000	550.000.000	26	182	100,1	50%	50,1	35%
TP2 = short sea	1.084.036.691	500.000.000	700.000.000	18	126	88,2	50%	44,1	31%
TP3 = rail-river-short sea	733.240.644	500.000.000	600.000.000	9	63	37,8	50%	18,9	13%
Catalyst	845.937.744			12	84	63,0		31,5	22%
TP1 = rail			750.000.000	4	28	21,0	50%	10,5	7%
TP2 = iww			750.000.000	4	28	21,0	50%	10,5	7%
TP3 = sss			750.000.000	4	28	21,0	50%	10,5	7%
Common Learning				9	63	0,0		0,0	0%
TP1				5	35	0,0	75%	0,0	0%
TP2				4	28	0,0	75%	0,0	0%
Motorway of the Sea	2.603.303.940			0	0	0,0		0,0	0%
TP1 = new sss-terminal (sss+rail)		2.000.000.000	2.000.000.000	0	0	0,0	50%	0,0	0%
TP2 = new inland terminal (sss+iww)		2.000.000.000	2.000.000.000	0	0	0,0	50%	0,0	0%
TP3 = upgrading existing port (sss+rail/iww)		2.000.000.000	2.000.000.000	0	0	0,0	50%	0,0	0%
Rail Synergy	3.000.000.000			0	0	0,0		0,0	0%
TP1 = upgrading railinfra (rail)		500.000.000	500.000.000	0	0	0,0	50%	0,0	0%
TP2 = integrated freight-pax		500.000.000	500.000.000	0	0	0,0	50%	0,0	0%
TP3 = the last mile		500.000.000	500.000.000	0	0	0,0	50%	0,0	0%
Traffic Avoidance				0	0	0,0		0,0	0%
TP1 = new machine		500.000.000	500.000.000	0	0	0,0	60%	0,0	0%
TP2 = relocation of DC		500.000.000	500.000.000	0	0	0,0	60%	0,0	0%
TP3 = rearrangement of logistics chain		500.000.000	500.000.000	0	0	0,0	60%	0,0	0%
TOTAL				74	518	289,1		144,6	100%

Alternative III-part 2

TKM/EUR - ratio= 500 Infra funding = 35%

Total services cost (mio EUR)	Infrastructure cost/project (mio EUR)	Total infrastructure cost (mio EUR)	max funding infrastructure	Total costs (mio EUR)	Share in costs	Total EC Subsidy request (mio EUR)	Share in EC subsidy
452,2				452,2	37%	452,2	55%
200,2						200,2	
176,4						176,4	
75,6						75,6	
126,0		637,9	223,2	763,9	62%	349,2	42%
42,0	7,6	212,6	74,4			116,4	
42,0	7,6	212,6	74,4			116,4	
42,0	7,6	212,6	74,4			116,4	
22,8				22,8	2%	22,8	3%
12,6						12,6	
10,1						10,1	
0,0		0,0	0,0	0,0	0%	0,0	0%
0,0	15,5	0,0	0,0			0,0	
0,0	7,6	0,0	0,0			0,0	
0,0	7,8	0,0	0,0			0,0	
0,0		0,0	0,0	0,0	0%	0,0	0%
0,0	10,4	0,0	0,0			0,0	
0,0	7,0	0,0	0,0			0,0	
0,0	2,0	0,0	0,0			0,0	
0,0		0,0	0,0	0,0	0%	0,0	0%
0,0	0,8	0,0	0,0			0,0	
0,0	2,7	0,0	0,0			0,0	
0,0	0,6	0,0	0,0			0,0	
601,0		637,9	223,2	1238,8	100%	824,2	100%

Annex 8 Budget calculation-investment costs typical projects

Typical projects Motorways of the Sea

Description of typical project: development of a new short sea terminal in an existing port

A typical *Motorways of the Sea* project could be the development of a new short sea terminal in an existing port. The locations can be in any country with a coastal area.

In case modern infrastructure will be developed in one of these locations, shipping lines can start a fast cargo route by sea. Presently the growth of the short sea shipping is about 2.5% per year. This is below potential. The ships can either carry containers or containers on trailers or even trucks. The ships may vary in length, type etc. (assumed ship length is 130-150m). It is essential that the infrastructure will perfectly match the type of ships and equipment that will be used.

A typical Short Sea Terminal can consist of a quay wall with a maximum water depth of 10m and a length of 300m (2 ships). The quay wall will be constructed within the sheltered area of an existing port.

A Short Sea Terminal requires about 100m of land behind the quay wall, which results in a stacking area of about 30,000m². Furthermore other port elements, such as utilities, internal roads, buildings and fencing will be provided.

Overview of infrastructure elements (i.e. quay reinforcement, paved surface, rail track, terminals, cranes):

- New quay wall, concrete deck on piles or metal sheet piling. 300m long, The quay wall will be equipped with crane rails for Gantry Cranes.
- Paved stacking area of 30,000m²
- Buildings, gatehouse, workshop, canteen etc.
- Internal road connection to other terminals in the port
- Utilities, such as electricity, water etc.
- Rail tracks
- Port Equipment such as mobile or gantry cranes and reach stackers. (not included in the cost estimate)

Item	Cost / Unit (EUR)	Unit	Quantity	Total cost (EUR)
Quays	25,000	M	300	7,500,000
Stack area pavement	85	M ²	30,000	2,550,000
Internal roads	360	M	1,000	360,000
Electricity				350,000
Lighting poles				150,000
Drainage				150,000
Water / Sewage				50,000
Telephone /Data				50,000
Gatehouse	1,000	M ²	300	300,000
Repair workshop	1,400	M ²	600	840,000
Buildings	1,000	M ²	300	300,000
Fencing	100	M	1,000	100,000
Security measures	1		250,000	250,000
Rail on terminal	550	M	600	330,000
Subtotal				13,280,000
Contingency	10%			1,328,000
Total (2004 prices)				14,608,000
Total (2007 prices)				15,502,126

Description of typical project: development of a new river or inland terminal

A typical *Motorways of the Sea* project could be the development of a new river or inland terminal. Inland waterway transport complements sea transport perfectly. This is presently the case in many North Sea ports. The inland terminals can be developed, either to connect countries or regions to the national waterways or to the European inland waters. Possible locations for inland terminals are in any country with a major existing waterway infrastructure network (Germany, Belgium, France, Netherlands and some of the new EU member countries, especially those along the river Danube).

The river vessels can either carry containers or containers on trailers or even trucks. The ships may vary in length, type etc. It is essential that the infrastructure will perfectly match the type of ships and equipment that will be used.

Typical necessary infrastructure consists of a quay wall with a water depth of about 7 meters and a length of 200 to 300m. The total stacking or storage area will be about 25,000m². Furthermore other port elements, such as utilities, internal roads, buildings and fencing will be provided.

In addition to the terminal infrastructure, attention should be paid to the navigability of rivers and inland waterways.

Overview of infrastructure elements (i.e. quay reinforcement, paved surface, rail track, terminals, cranes):

- New quay wall, concrete deck on piles or metal sheet piling. 300m long
- Paved stacking Area of 25,000m²
- Buildings
- Internal connection to other terminals in the port
- Utilities, such as electricity, water etc.
- Port Equipment such as mobile or gantry cranes and reach stackers (not included in the cost estimate).

Item	Cost / Unit (EUR)	Unit	Quantity	Total cost (EUR)
Quays	10,000	M	300	3,000,000
Stack area pavement	85	M ²	25,000	2,125,000
Internal roads	360	M	500	180,000
Utilities				
Electricity				250,000
Lighting poles				100,000
Drainage				100,000
Water / Sewage				50,000
Telephone /Data				50,000
Buildings	1,000	M ²	300	300,000
Fencing	100	M	1,000	100,000
Security measures	1		250,000	250,000
Rail on terminal				
Subtotal				6,505,000
Contingency	10%			650,500
Total (2004 prices)				7,155,500
Total (2007 prices)				7,593,474

Description of typical project: the redevelopment or upgrading of an existing part of an existing port into a short sea terminal

A typical *Motorways of the Sea* project could be the redevelopment or upgrading of an existing part of an existing port into a short sea terminal, so possible locations can be in any existing seaport.

Many ports have abandoned quay walls or quay walls, which are not up to date and not longer in use. Sometimes these quays can be upgraded or renovated in such a way that they are suitable for short sea transport cargo handling.

Of course it is very difficult to budget the costs for the renovation of existing quays. It is therefore assumed that the total costs are about 60% of the new value.

In addition to the renovation, the existing paved area will be repaired and buildings and other Port necessities will be provided.

Overview of infrastructure elements (i.e. quay reinforcement, paved surface, rail track, terminals, cranes):

- Renovation of existing quay wall, assuming to be 300m long
- Paved stacking Area of 30,000m²
- Upgrading of the existing buildings
- Utilities, such as electricity, water etc.
- Rail tracks
- Port Equipment such as mobile or gantry cranes and reach stackers. (not included in the cost estimate)

Item	Cost / Unit (EUR)	Unit	Quantity	Total cost (EUR)
Quays	15,000	M	300	4,500,000
Stack area pavement	30	M ²	30,000	900,000
Internal roads				
Utilities				300,000
Electricity				
Lighting poles				
Drainage				
Water / Sewage				
Telephone /Data				
Gatehouse				
Repair workshop				
Buildings	1000	M ²	300	300,000
Fencing	100	M	1,000	100,000
Security measures	1		250,000	250,000
Rail on terminal	550	M	600	330,000
Subtotal				6,680,000
Contingency	10%			668,000
Total (2004 prices)				7,348,000
Total (2007 prices)				7,797,756

Typical projects Rail Synergy

Description of typical project: Upgrading rail infrastructure

A rail link for freight trains between a West-European freight node (called 'A') and a node in Middle-European (new) Member States (called 'B'). Frequency is 1-3 times per week. The existing node 'A' is fully equipped with all needed infrastructure (e.g Rail Service Centre). By upgrading / refurbishing 'B', a new (or upgraded) rail link emerges between A en B (e.g. between the Port of Rotterdam and a Polish city, but many other combinations are possible). Typical length of rail link is approximately 400 – 100 km. Freight is transported by 20'-containers. In B, connecting transport is mainly by road. Interchange between rail and road is done by standard container lifters.

Overview of infrastructure elements (i.e. quay reinforcement, paved surface, rail track, terminals, cranes):

Item	Cost / Unit (in EUR)	Unit (in m, m ² , %, other)	Quantity	Total cost (in EUR)	Remarks
Platform for 2 container lifters and small stack	500	m ²	10,000	5,000,000	
Track 1 km	2,500,000	km	1	2,500,000	
Switch	150,000		2	300,000	
Repair workshop	250,000		1	250,000	
Gate (building)	150,000		1	150,000	
Other buildings	150,000		2	300,000	
Fencing, security	2,000	m	200	400,000	
Container lifter (no to be subsidized)	250,000		2	-	
Subtotal				8,900,000	
Contingencies			10%	890,000	
Total (in current prices 2004)				9,790,000	
Total (corrected for 2007 price level, 2% yearly inflation)				10,389,226	

Description of typical project: Integrated freight passenger train

Existing long haul (up to 1000 km) pax-service is combined with a new freight service, by coupling 2-3 freight wagons onto pax-train. On separate track on the outside of the yard, freight wagons are loaded from lorries. At designated time, freight wagons are shunted to pax -train by shunting loc. Due to logistics, this seems only viable on terminal stations of pax service. The combined freight goes from terminal to terminal stations (e.g. flowers from Denmark to Austria). Frequency: 2-3 times per week

Overview of infrastructure elements (i.e. quay reinforcement, paved surface, rail track, terminals, cranes):

Item	Cost / Unit (in EUR)	Unit (in m, m ² , %, other)	Quantity	Total cost (in EUR)	Remarks
Modifications to platform	250	m ²	2,000	500,000	
Modifications to buildings	500,000		1	500,000	
Track					
Switch					
Warehouse					
Repair workshop					
Gate (building)					
Access to external roads					
Fencing & security	5,000	m	40	200,000	
Subtotal				1,200,000	
Number of stations			5	6,000,000	
Contingencies			10%	600,000	
Total (in current prices 2004)				6,600,000	
Total (corrected for 2007 price level, 2% yearly inflation)				7,003,973	

Description of typical project: "The last mile"

Another typical project within the Rail SynergyAction might aim at connecting production or distribution sites of shippers to nearby rail tracks. In this specific project it is assumed that rail infrastructure close to a certain freight location already exist, and that to some extent modifications to rail infrastructure and premises is necessary. Further, short rail tracks (including switches) needs to be build in order to connect the production or distribution location with the nearby rail network. This specific project enables shippers to shift freight directly from road to rail.

Overview of infrastructure elements (i.e. quay reinforcement, paved surface, rail track, terminals, cranes):

Item	Cost / Unit (in EUR)	Unit (in m, m ² , %, other)	Quantity	Total cost (in EUR)	Remarks
Modifications to platforms	250	m ²	2,000	500,000	
Modifications to buildings	200,000		1	200,000	
Track	2,500,000	km	0,15	375,000	
Switch	150,000		2	300,000	
Warehouse					
Repair workshop					
Gate (building)					
Access to external roads					
Fencing & security	2,000	m	150	300,000	
Subtotal				1,675,000	
Number of stations			1	1,675,000	
Contingencies			10%	167,500	
Total (in current prices 2004)				1,842,500	
Total (corrected for 2007 price level, 2% yearly inflation)				1,955,276	

Typical projects Traffic Avoidance

Description of typical project: new machinery for product modification

By modification of the products, including the packaging of the goods, vehicle utilization can be increased substantially. A typical project under the Traffic Avoidance Action could be the modification of goods by extracting water or air from the products to be transported (i.e. extract water or fluids from juices). For that purpose special machinery or equipment is necessary. The volume and weight of the goods transported might diminish substantially, and so might tonne-kilometres.

Cost for equipment or machinery is assessed at EUR 771,360.00. This estimation is based on information derived from a Dutch programme on traffic avoidance and reflects the average costs for projects aiming at a decrease of the amount of water or air in goods transported.

Description of typical project: rearrangement of logistics chains

By rearranging logistics chains efficiency of the transport of goods can be improved. A typical project under the Traffic Avoidance Action could be the (partly) removal of production processes in the total logistics chain, closer to other locations, which are part of the production process. With that the average length of haul of freight transport, and thus tonne-kilometres, can be diminished. For that purpose machinery for the production process have to be dismantled, transported and then rebuilt at a new location.

Cost for such an operation is assessed at EUR 563,344.00. This estimation is based on information derived from a Dutch programme on traffic avoidance and reflects the average costs for projects aiming at decreasing the transport performance (tonne-kilometres) by rearranging the logistics chain of specific products.

Description of typical project: Relocation of distribution centre

An even more substantial contribution to traffic avoidance might be achieved by relocation of distribution centres. Aim of such projects is to diminish the average length of haul between production markets and the distribution centre or between consumer markets and the distribution centre. With that total transport performance on the road might be decreased substantially. A specific project might be the construction of a (new) distribution centre close to existing producer or consumer markets.

Overview of infrastructure elements:

Costs for construction of a DC is assessed at EUR 2.7 million (price level July 2003). This estimation is based average construction costs of EUR 413 per gross m² and corrected for 2% of yearly inflation. This cost estimate is based on construction figures of a distribution centre existing of two levels including business premises (see also: http://www.zibb.nl/bouw/utiliteitsbouw_zoom.asp?artnr=684780&versie=1).

Note:

For Catalyst Actions no typical projects are defined. The amount of infrastructure investments necessary in catalyst projects is treated as equivalent to upgrading of existing port and terminal infrastructure or investment in new ports or terminals (see Motorways of the Sea).

Annex 9 Stakeholders' consultation

Persons that completed the questionnaire

- Martin Burkhardt, International Union of combined Rail Road Companies (UIRR)
- Graham Fairhurst, RailFreight Group (RFG)
- Robert Goundry, Freightliner, for European Rail Freight Association (ERFA)
- Gavin Roser, Freight and Logistics Leaders Club (FLLC)
- Karin de Schepper, Inland Navigation Europe (INE)
- Jürgen Sturm, European Federation of Inland Ports (EFIP)
- Peter Wolters, European Intermodal Association (EIA)

New Marco Polo Programme (2007-2013)

Ex ante evaluation - Stakeholders' consultation

Questionnaire

Introduction

Background

The Directorate General for Energy and Transport (DG TREN) is designing and preparing the proposal of the Commission for the renewed multi-annual Community programme in the field of transport, the Marco Polo II (Marco Polo II) programme for the period 2007-2013. This proposal aims at updating the current Marco Polo programme.

Part of the procedure towards getting the Marco Polo II proposal accepted is to carry out an ex ante evaluation. DG TREN has approached ECORYS to carry out the ex ante evaluation for Marco Polo II. An important element of the ex ante evaluation is the stakeholders' consultation process. In this process relevant stakeholders are asked for their opinion on the direction, scope and contents Marco Polo II. Results of stakeholders' consultation are input in the ex ante evaluation, which is an important input for determining the final scope of Marco Polo II.

We would like to thank you for taking some time to answer a number of questions, e.g. on experiences with previous programmes (PACT) and ongoing programmes (current Marco Polo programme), but also on expectations of the new Marco Polo programme. Again, we would like to emphasize that this is an opportunity to give your opinion and influence the shape of the programme. Please try to answer the following questions, giving your opinion in a few lines. Below, we first give some explanation on Marco Polo II.

The new Marco Polo programme

The Marco Polo II programme will run from 2007 to 2013 and will be the follow up the (current) Marco Polo I programme (2003-2006). The general objective of the Marco Polo II programme is: *“to reduce road congestion and to improve the environmental performance of the freight transport system within the Community and to enhance intermodality, thereby contributing to an efficient and sustainable transport system”*. The specific objective of the Marco Polo II programme is *to shift at least the expected aggregate increase in international road freight traffic (base year 1998), but preferably more, to alternative modes of transport*. Two main ways of delivering this specific objective have been identified: Modal Shift Actions and traffic avoidance. Marco Polo II aims at short-term, bottom up services solutions. Unlike Marco Polo I, that hardly subsidized infrastructure, Marco Polo II offers room for subsidizing infrastructure, if related to creating new intermodal services and if realizable in 18 months. The specific actions that fit within the programme are presented below, as part of a question under the next heading.

On May 7th the Commission will come out with its communication on new programmes, providing more information on Marco Polo II.

Questionnaire

Experiences with previous and ongoing programmes: PACT and Marco Polo

Please describe 3 positive and 3 negative aspects of PACT.

Positive aspects	Negative aspects

What lessons can be learned from PACT?

Please describe 3 positive and 3 negative aspects of Marco Polo?

Positive aspects	Negative aspects

What lessons can be learned from Marco Polo (first call 2003)?

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Marco Polo II

Block 1: Problems and needs assessment

What should be the target groups of Marco Polo II, who should be the main beneficiaries?

How can these beneficiaries be involved?

What possible negative side effects do you foresee and how could these be reduced?

What do you consider to be the main risks of Marco Polo II?

Block 2: Objectives

What are your expectations from the Marco Polo II programme?

Do you think the Marco Polo II programme will contribute effectively to achieve the objective as described in the introduction?

Are there alternative options that could deliver to the stated Marco Polo II objectives?
How do you value these options as compared to Marco Polo II?

Block 3: Type of actions and their impact

What do you think of the planned actions within Marco Polo II? Give your opinion on each of the following actions, stating whether:

- They will contribute to the goals, and in what way?
- They will be feasible?
- The market will accept these?
- They will be cost effective?

Modal Shift Actions: aimed at shifting freight off the road, need to be robust but not innovative.

Contribution to goals:

Feasibility:

Market acceptance:

Cost effectiveness:

Catalyst actions: creating innovative new services that try to overcome structural market barriers.

Contribution to goals:
Feasibility:
Market acceptance:
Cost effectiveness:

Motorways of the Sea: in fact a Catalyst Action, aimed at creating short sea services for large volumes with high frequencies

Contribution to goals:
Feasibility:
Market acceptance:
Cost effectiveness:

Integrated freight-passenger transport services³⁶: also in fact a Catalyst Action, aiming to create high frequency intermodal services by combining freight with passengers

Contribution to goals:

Feasibility:

Market acceptance:

Cost effectiveness:

Common Learning actions on modal shift: improving co-operation and sharing know-how.

Contribution to goals:

Feasibility:

Market acceptance:

Cost effectiveness:

³⁶ At the time of making the questionnaire, there was still an action defined integrated freight-passenger action. In the course of Marco Polo II formulation the scope of this action was broadened and renamed Rail Synergy.

Transport avoidance that take freight off the road by avoiding transportation altogether, for instance by reducing volume or weight, decreasing distances, saving on return flows, increasing load factors.

Contribution to goals:
Feasibility:
Market acceptance:
Cost effectiveness:

How do you see Marco Polo II's contribution to modal shift and to traffic avoidance, and how (for instance by which actions) could this best be achieved?

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Block 4: Alternative delivery mechanisms and risks

Do you have any suggestions for alternative actions that would fit within Marco Polo II? Keep in mind the requirement of short-term realisation. You do not need to limit yourself to new services only, but you could also think of infrastructure that could facilitate new services. Likewise, do not restrict to shifting cargo off the road only, but you could also consider Traffic Avoidance Actions or other measures that you find relevant.

Do you have any suggestions/opinion on the procedures to be followed in Marco Polo II? Think about accessibility, selection, the requirement of a sound business plan, contractual issues, monitoring. You may use your PACT and Marco Polo I experience here.

Block 5: Contribution to community objectives

What similar type of programmes aimed at intermodal shift and traffic avoidance are implemented at Member State level (EU-25)? If possible, give name and web-address of the programme.

How do you see the added value of Marco Polo II on a European level? Or do you think this type of programme could better be carried out on a national level?

What is your opinion on the funding mechanism? Is a subsidy the best mechanism, or could there be better alternatives (such as price/tax policies, regulations, subsidized or interest-free loans)?

Block 6: General question

If you think about Marco Polo II in terms of possible problems, objectives, alternatives (programmes, actions, funding mechanisms) and risks, is there any further remark that you would still want to make?

Questions?

In case of questions, please contact Eric van Drunnen (+31 10 453 8607, eric.vandrunen@ecorys.com) or Geert Smit (+31 10 453 8775, geert.smit@ecorys.com).

Annex 10 Impact Assessment

Introduction

The indirect benefits of the Marco Polo II programme are defined in a number of areas: economic, environmental, social, competitiveness and security. Out of these, the external (environmental) and accident impacts are quantified using marginal costs estimates from former DG TREN research (UNITE, RECORDIT, REALISE) and other sources (INFRAS/IWW, OECD). The other types of impacts are assessed on a qualitative level.

The approach is consistent with the approach followed by DG TREN for calculation of external costs for the first Marco Polo Call for proposals. This is presented as the Base Case. However, we have also carried out an appreciation of these figures and put forward proposals for modification of values. This resulted into a sensitivity analysis.

General methodology

The impacts are defined as the difference between the reference situation (without MPII) and the situation in 2013 with MPII.

For each of the six actions of MP II, the expected ton-kilometres (TKM) shift of the road has been estimated (see annex Y). These TKMs are either shifted to other modes (rail, inland waterways, short sea shipping) or just avoidance of transport. In order to assess the economic, external and accident impacts the following methodology is applied:

1. Define the total road TKM shifted to rail, inland waterways, short sea shipping and avoidance (per action separately).
2. Calculate the total externality costs for the road TKM by multiplying with the marginal cost estimate per TKM.
3. Calculate the total externality costs for the TKM shifted to rail, inland waterways, short sea shipping by multiplying with the respective marginal cost estimate per TKM.
4. Calculate [2] – [3]

The purpose of the impact assessment is to compare the six actions. The calculations provide the input for the assessment. It should be noted that the calculations should only be used for ranking, since quite some previsions on transferability and other assumptions are needed.

Base Case: External costs estimates freight transport

The external cost estimates for freight transport are consistent with the approach followed for the calculation of the external cost for the first Marco polo Call for proposal. This is done for reasons of comparability. Therefore the assumptions and methodology to calculate the estimates is not discussed although a wide variety is seen amongst the studies undertaking in the last four years.

The main source of marginal cost estimates is the UNITE project and especially the report on “guidance on adapting marginal cost estimates”. The transfer of marginal costs studies from one context to another may be varied in terms of i) transfer of methodology,

ii) transfer of functional relationships and input values and iii) transfer of output values. In the context of this Impact Assessment, the transfer of output values is most relevant.

In general for each marginal cost estimate, specific remarks on transferability are made which relate to methodological issues. Apart from these methodological remarks, other transferability areas are important for the interpretation of the figures:

- Transfer between countries
- Changes in values over time

In general it is advised to avoid common (average) European values because these hide genuine differences in willingness to pay between countries. If national studies are available, these should be used. However, for the Impact Assessment of MPII this country specific approach is not feasible since it is not known whether the projects will be situated. Therefore average European figures are applied.

The calculations should preferably use the estimated marginal costs in 2013. In general it is assumed that values will increase over time with the increase in real income. However, an accurate estimate of this increase in real income in EU25 until 2013 is not available, therefore no adjustment is made.

The following external cost parameters have been taken into account:

- Air pollution
- Global warming
- Noise
- Safety (accidents)
- Congestion
- Infrastructure

The specific costs provided by the UNITE project (in vehicle-kilometres) are transformed into specific costs per tonne-kilometre. For this reason a number of basic assumptions is needed.

Table 1 Basic assumptions per mode (Base Case)

Mode	Capacity	Loading factor	Net load (tonne)
Road	2 TEU	80%	18.4
Rail	50 TEU	75%	431
Inland Waterways	140 TEU	60%	966
Maritime Transport	-	-	-

The next table provides the values per tonne-kilometre used for the calculation:

Table 2 Marginal cost estimates per tonne-kilometre for external impacts (Base Case)

Type of Impact	Range of values (€/ tonne-kilometre)	
	Mode	Value
External impacts		
Air pollution	Road	0.0089
	Rail	0.0046
	Inland Waterways	0.0062
	Short Seas Shipping	0.0056*
Global warming	Road	0.0026
	Rail	0.0046
	Inland Waterways	Included in air pollution figures
	Short Seas Shipping	Included in air pollution figures
Noise	Road	0.0028
	Rail	0.0009
	Inland Waterways	Negligible
	Short Seas Shipping	Negligible
Accident costs	Road	0.0043
	Rail	0.0014
	Inland Waterways	Negligible
	Short Seas Shipping	Negligible
Congestion	Road	0.0226**
	Rail	Not applicable
	Inland Waterways	Not applicable
	Short Seas Shipping	Not applicable
Infrastructure	Road	0.0043
	Rail	0.0037
	Inland Waterways	0.0038
	Short Seas Shipping	0.0034

* UNITE does not provide figures for Short Sea Shipping, the REALISE and RECORDIT project indicate external costs for Short Sea Shipping are slightly lower than for Inland Waterways (90%)

** The minimum value for specific congestion costs is set at 0.0113 €/ tonne-km. However, this is a rather modest estimation, for this impact assessment the congestion cost is set at 0.0226 €/ tonne-km. It should be noted that congestion is highly time- and location specific: it is recommended to assess this on a project level.

Modal shift per action

As mentioned in chapter 9, the following modal shift per action is foreseen:

Table 3 Modal shift to respective modes by action

Action	Shifted to	Total modal shift
Modal Shift	Rail	26.0
	Short Sea Shipping	22.1
	Rail-Inland Waterways-Short Sea	9.5
	<i>Sub-total</i>	<i>78.8</i>
Catalyst action	Rail	7.9
	Inland Waterways	7.9
	Short Sea Shipping	7.9
	<i>Sub-total</i>	<i>23.7</i>
Common Learning	Not applicable	-
Motorways of the Sea	Short Sea Shipping – Rail	14.0
	Short Sea Shipping – Inland Waterways	14.0
	Short Sea Shipping – Inland Waterways/Rail	14.0
	<i>Sub-total</i>	<i>42.0</i>
Rail Synergy	Rail	10.5
Traffic Avoidance	Not applicable	10.5*

* For Traffic Avoidance the figure represents road tonne-kilometre saved due to increased efficiency (e.g. higher load factors) and transport avoidance (e.g. less links in the logical chain).

The following table represents the external impacts of the “no-policy” situation, which is without the MP II programme meaning a growth in international road freight traffic of 144.1 billion tonne-kilometre.

Table 4 Base case: Indicative external impacts for the reference scenario (=without MP II) in billion euro

External Impacts							
	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	Total
Total	1.28	0.38	0.40	0.62	3.26	0.62	6.57

In the next table the estimated externalities of the MP II programme are presented

Table 5 Base Case: Indicative external impacts for MP II in billion euro

External Impacts							
	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	Total
Total	0.71	0.25	0.05	0.10	0.00	0.48	1.59

The following table represents the net environmental benefits (reference scenario minus MPII scenario).

Table 6 Base Case: Indicative impacts in billion euro

Action	External Impacts						Total
	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	
Modal Shift	0.22	0.02	0.14	0.21	1.30	0.04	1.92
Catalyst action	0.08	0.03	0.06	0.09	0.54	0.02	0.81
Common Learning	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motorways of the Sea	0.14	0.08	0.11	0.15	0.95	0.03	1.46
Rail Synergy	0.05	-0.02 ³⁷	0.02	0.03	0.24	0.01	0.32
Traffic Avoidance	0.09	0.03	0.03	0.05	0.24	0.05	0.48
Total	0.58	0.12	0.35	0.52	3.26	0.14	4.98

Sensitivity Analysis: Appreciation of Cost Estimates

The appreciation is focused at both the basic assumptions per mode made and the specific cost estimate values³⁸.

In our view the average load per mode is rather high. If the Dutch international road freight traffic statistics provided by the National Statistical Office are taken into account, the average net load of the loaded trucks is 18.6 ton for the period 1997-2002. If corrected for empty running, the average net load drops to **13.0 ton**. This is also more in line with our expectations. This figure is an adequate approximation of the average for the 'old' EU15. For inland waterways, the same applies. If corrected for empty running the average load for inland waterways is around **770 ton**.

The value for rail is somehow different. If all types of cargo are taken into account for the international traffic, as well as empty running, our estimated value is **580 ton** per train³⁹.

The differences could be explained by the fact that in the approach followed by DG TREN only container transport is taken into account.

The second adjustment concerns the emission cost estimate for road transport. According to the DG TREN approach, 70% of the international traffic is taking place in rural/interurban areas and 30% in urban areas. The cost estimate is calculated accordingly. Our estimation would be to have 90% of international traffic in rural/interurban areas and 10% in urban areas.

³⁷ The negative impact for global warming is a consequence of the marginal cost estimates used as provided by DG TREN: 0.0026 eur/tonne-kilometre for road and 0.0046 eur/tonne-kilometre for rail. An appreciation of these figures led to some modifications of values. This resulted into a sensitivity analysis.

³⁸ It should be noted that an appreciation of the basic figures taken from the previous DG TREN approach, in cost estimates per vehicle-kilometre, should in principle also be taken into account. This is not done in the scope of this ex-ante evaluation.

³⁹ Source: Dutch Rail Freight Monitor 2002

The results of these adjustments are presented in the following tables:

Table 7 Sensitivity analysis: Indicative external impacts for the reference scenario (=without MPII) in billion euro

External Impacts							
	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	Total
Total	1.09	0.53	0.57	0.88	4.62	0.88	8.57

In the next table the estimated externalities of the MP II programme are presented

Table 8 Sensitivity analysis: Indicative external impacts for MPII in billion euro

External Impacts							
	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	Total
Total	0.76	0.19	0.04	0.09	0.00	0.50	1.58

The following table represents the net environmental benefits (reference scenario minus MPII scenario).

Table 9 Sensitivity analysis: Indicative impacts in billion euro

External Impacts							
Action	Air pollution	Global warming	Noise	Safety	Congestion	Infra-structure	Total
Modal Shift	0.13	0.11	0.21	0.32	1.84	0.15	2.76
Catalyst action	0.04	0.06	0.09	0.14	0.76	0.05	1.13
Common Learning	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motorways of the Sea	0.04	0.13	0.16	0.21	1.34	0.08	1.97
Rail Synergy	0.04	0.00	0.03	0.05	0.34	0.04	0.50
Traffic Avoidance	0.08	0.04	0.04	0.06	0.34	0.06	0.62
Total	0.33	0.34	0.54	0.79	4.62	0.38	6.99

The sensitivity analysis shows that the net external benefits (6.99 billion euro) are higher compared to the Base Case (4.98 billion euro).