
ASSESS

Assessment of the contribution of the TEN and other transport policy measures to the mid-term implementation of the White Paper on the European Transport Policy for 2010

FINAL REPORT

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Preface

This is the draft final report for ‘Assessment of the contribution of the TEN and other transport policy measures to the mid-term implementation of the White Paper on the European Transport Policy for 2010’.

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Executive summary

The White Paper on the European Transport Policy

On 12 September 2001, the European Commission published the White Paper “European transport policy for 2010: time to decide”. The White Paper analysed the existing situation with regard to transport and set out an ambitious action programme up to 2010. Whilst supporting economic growth and maintaining the right to mobility, it proposes to improve sustainability of transport through restoring the balance between road, rail, waterway and shipping, developing intermodal transport, combating congestion and putting safety and service quality at the heart of the transport policy.

Five years on, the White Paper on transport has proved to be an important step forward in improving the transport sector in Europe. The strategy and the accompanying action program are ambitious, although only a few targets were quantified.

The ASSESS Project

The 2001 White Paper planned a mid-term assessment of its own achievements, which was to be launched in 2005. The mid-term assessment concerns the implementation of the measures it advocates, and is to check whether the targets and objectives are being attained or whether adjustments are needed.

The ASSESS Project, which is summarised in this report, has been set up to provide the technical support to the Commission services for this mid-term assessment. In particular, the ASSESS project has assembled comprehensive information at the European level to carry out an assessment of both the achievements to date, the possible policy implementation scenarios to the year 2010, and the longer term prospects to the year 2020.

Achievements to date are encouraging

Five years on, the White Paper on transport has proved to be an important step forward in improving the transport sector in Europe. The action programme of the White Paper has included 78 measures, under 12 policy packages. The progress in implementation since 2001 in terms of legislative activities is summarised in Table 1.

The legislative activities at the European Union level are well advanced. To date new legislation covering around 50% of the White Paper measures have been adopted by the European Parliament and the Council and the proposals for legislation for another 15% of the measures has been adopted by the European Commission and pending approval by the Parliament or Council. However, the measures that are not yet implemented are often the more difficult ones, which may have an high impact on the transport system, for instance the pricing measures. A number of the measures with high expected impact are unlikely to realized in the period 2005-2010, for instance with regard to taxes on kerosene.

The advancement of the implementation activities at the Member State level is much lower. This is not unexpected. After the European Institutions have approved a particular piece of legislation, then the Member States usually have around three years to translate the new European legislation into their own national legislation.

Especially in the new Member States the policy implementation is comparatively less advanced. This is explained by the differences in timing. In the EU15 the level of implementation is the result of a five year period, while for the new Member States, which joined the EU in 2004, the evaluation only reviews a period of one year.

There are three policies that have high degrees of advancement with the implementation of the White Paper policies at the EU level. This is the development of the Trans-European Transport Networks (TEN-T) where the Commission have executed a revision of the TEN-T project in 2004 and have renewed the financing mechanism. Moreover the policies on developing high quality urban transport and putting research and technology at the service of clean, efficient transport are relatively well advanced, partly because the proposed measures within these two policies are more modest. They predominantly aim at promotion and support activities, which are well embedded in several research and support programmes of the Commission.

Table 1: Advancement of Implementation activities (2005)

		Advancement at		
		EC	Member States EU15	new Member States NMS10
				
				
				
				
1	Improving quality in the road transport sector			
2	Revitalizing the railways			
3	Controlling growth in air transport			
4	Promoting transport by sea and inland waterway			
5	Turning intermodality into reality			
6	Building the Trans-European transport network			
7	Improving road safety			
8	Effective charging for transport			
9	Recognizing the rights and obligations of users			
10	Developing high-quality urban transport			
11	Putting research and technology at the service of clean, efficient transport		n.a.	n.a.
12	Managing the effects of globalization		n.a.	n.a.

n.a. =
not applicable/
no data available

The progress is slow in implementing the Community policy on effective transport charging. Only just in 2005, a directive on road pricing is being discussed by the European Institutions having reached a political agreement at Council level before going to the Parliament for a second reading but this directive has a limited scope. The EC just has renewed the TEN financing mechanism, but the budget is still missing. Consequently, the implementation activities in the various Member States are also low.

In the air sector, much has been achieved with regard to liberalisation of the air sector, but the measures aiming to manage the growth and the negative effects on the environment are lagging behind, for instance the introduction of market mechanism in slot allocation procedures on Community airports, kerosene taxation, differential en route air navigation charges and airport charges.. Since the White Paper bases its approach to aviation on the latter, the implementation is given a low score.

By 2010, the implementation will not be complete – pricing measures remain a big problem

The prospects to 2010 of policy implementation have been examined based on current evidence. This is summarised in Table 2. Substantial progress may be expected in the period 2005-2010. By 2010, most policies will have a high implementation score at the EU level and a medium implementation score at the level of the Member States. Nevertheless, based on the review of current progress there are likely to be a few policies that may be lagging behind in 2010. The most important is the policy on effective charging for transport. Both at the level of the European Commission and in the new Member States the implementation is expected to be slow.

However, it must be noted that, independent of EC legislation, significant progress has been made in the adoption of road charging schemes in some Member States like Germany, the United Kingdom, Denmark, and Austria. The conclusion with regard to charging of air transport is similar.

Also the policy on intermodality is expected to be lacking behind, particularly in the new Member States. These Member States have put much effort in improving the formerly inefficient rail companies and in the rapidly growing road transport sector, but intermodality has been lacking behind.

Table 2: Estimate of the advancement of the implementation activities for the year 2010

		Advancement at			
		EC	Member States EU15	new Member States NMS10	
1	Improving quality in the road transport sector	Medium	High	Medium	 None  Low  Medium  High n.a. = not applicable/ no data available
2	Revitalizing the railways	Low	Medium	Medium	
3	Controlling growth in air transport	Medium	Medium	Low	
4	Promoting transport by sea and inland waterway	High	Medium	Medium	
5	Turning intermodality into reality	High	Medium	Low	
6	Building the Trans-European transport network	High	Medium	Medium	
7	Improving road safety	Medium	Medium	Medium	
8	Effective charging for transport	Low	Low	Low	
9	Recognizing the rights and obligations of users	High	Medium	Low	
10	Developing high-quality urban transport	High	Medium	Medium	
11	Putting research and technology at the service of clean, efficient transport	High	n.a.	n.a.	
12	Managing the effects of globalization	High	n.a.	n.a.	

The changing world since 2001 – enlargement, security, economic growth – results in need to adjust transport policy

At the time of the presentation of the White Paper on transport on 12 September 2001, the world was changing rapidly. Another major event was the accession of 10 new Member States on 1 May 2004.

But other conditions change too. In 2001 a GDP growth rate of 3% was assumed, and the oil prices were lower than nowadays. Political, economic, technological, and other relevant developments affect the background scenario and therefore the White Paper measures and objectives.

The slower than expected growth of the European economy results in a reduced growth rate of passenger and freight transport. On the other hand, a high competitive pressure on the markets reduces transport

prices, notably in air transport and road haulage. The public and private investments on infrastructure seem to be reduced as well. These conditions are likely to temper the attention paid to social and environmental objectives.

Note that a revival of the economy, foreseen in the period 2005-2010, has the reverse impacts on the White Paper objectives.

Since 2001, the fuel prices have been rising, and there is increasing evidence that prices continue to rise strongly in the coming decades. If petrol and diesel prices will remain for a longer period of time at a substantially higher level it may be expected that fuel and power train technologies of cars will change. This is in conformance with the White Paper policy on clean and efficient vehicles. However, the increases in fuel prices may also put pressure on carriers and transporters to reduce costs and thus endanger the social aspects of transport employment.

The continuous strong globalization of trade has already resulted in a sharp increase of imports and exports of both EU25. This underlines the importance of the EU policy on managing the effects of transport globalization, notably on maritime transport.

The EU enlargement and the role of the Member States

The process of EU enlargement from 15 to 25 countries fostered the development of new transport strategies in the 10 new Member States (NMS10), including new national transport policies. While these strategies generally emphasize the need to mitigate environmental and health impact of transport and to balance inter-modal splits, their implementation plans are heavily focused on the extension of long-distance Trans-European Networks to Central and Eastern Europe, with a focus on motorways.

The EU enlargement of 2004 and further enlargement processes make it more difficult to separate economic growth from transport demand growth. We should take into consideration that in those countries the share of railway in the transport market both for freight and passenger was considerable higher in the past and the first stage of their transformation process in comparison to the West Europe. Expectations that such situation would last have been unrealizable. However, their still relatively big rail mode shares have meant that instruments of revitalizing railways and strengthening their role have to be more intensively implemented in the EU15 than in the NMS10.

It has to be stressed that the improvement of road safety and user rights are big challenges in the NMS10, taking into consideration lower technical standards for vehicles, a not sufficiently high quality motorway network, and a drastic decline of public bus and railway services.

In the new Member States, but also in the “old” EU15, many of the problems encountered in implementing the European Common Transport Policy relate to the variation in regulatory and administrative environment in the field of transport across Member States.

Subsidiarity is the European Unions guiding principle in realising the objectives set out in the White Paper. Therefore, partnerships between the European Union’s institutions and the Member States are necessary at all levels, that is not only at the highest political and official level, but also among operators, users, investors and environmental organisations.

Security issues affect transport policy

Transport security is a challenge: aircraft have been used as weapons since the '70s and public transport services are very vulnerable targets (as recently demonstrated in Madrid and London). Ships can be used to smuggle arms globally. Terrorism may cause sudden drops in transport demand. Nowadays security is a basic element in the definition of quality transport services, however, a balance is required between operational needs and security requirements.

The White Paper on European transport policy was published September 12th 2001. It did not yet specifically address security, although the Community has always put a secure society for its residents as one important fundament of the Union. Today, Community policy on transport security relates to civil aviation, maritime transport, critical infra-structure, land passenger transport, the supply chain, transport of dangerous goods and energy facilities and infrastructures. The aim of this policy is to conceive and implement measures to improve security, mainly to protect citizens against terrorism.

DG TREN is the leading Directorate-General of the Commission for these topics. In addition, DG Enterprise is responsible for the main research and development projects. Coordination between both DG's synchronises the R&D on transport security.

Growths in transport demand

The analysis of the current statistics suggests that the White Paper measures may be starting to have a positive effect on the evolution of transport demand in Europe. In the freight transport sector, the decline in rail transport appears to have ended in the majority of Member States, and in the major economies like Germany and the UK, rail freight has been increasing rapidly in recent years. Growth in short sea shipping appears to be strong in a number of countries, and inland waterway traffic has largely maintained a healthy growth momentum on key corridors. In a number of Member States, road freight traffic growth has been slower than the GDP growth in recent years, although more empirical observations are required to ascertain this trend. In passenger rail transport, there has been strong growth in West Europe and the decline in the new Member States has been largely halted. In a number of metropolitan and urban areas, there have been remarkable examples of successful initiatives to promote public transport and walking/cycling.

Nevertheless, if the recent trends simply continue without strengthening the policy implementation, the White Paper targets on modal balance may not be met by 2010. The possible trajectories of transport demand growth have been tested using the SCENES European Transport Model, using up to date economic and demographic projections and reasonable assumptions regarding foreign trade growth, fuel prices, passenger and freight user prices, and the trends in freight logistics. Four main policy scenarios have been developed within the ASSESS project, corresponding to different levels of expectations in policy implementation. For the most likely scenario, two alternative tests have been made in order to examine the possible variations in demand growth as a result of the model assumptions on pricing and freight logistic trends. Compared with earlier transport demand forecasts, the ASSESS Project has made use of more recent GDP projections (which are lower than previous ones), and has benefited from a longer time series of freight demand observations up to 2003/04.

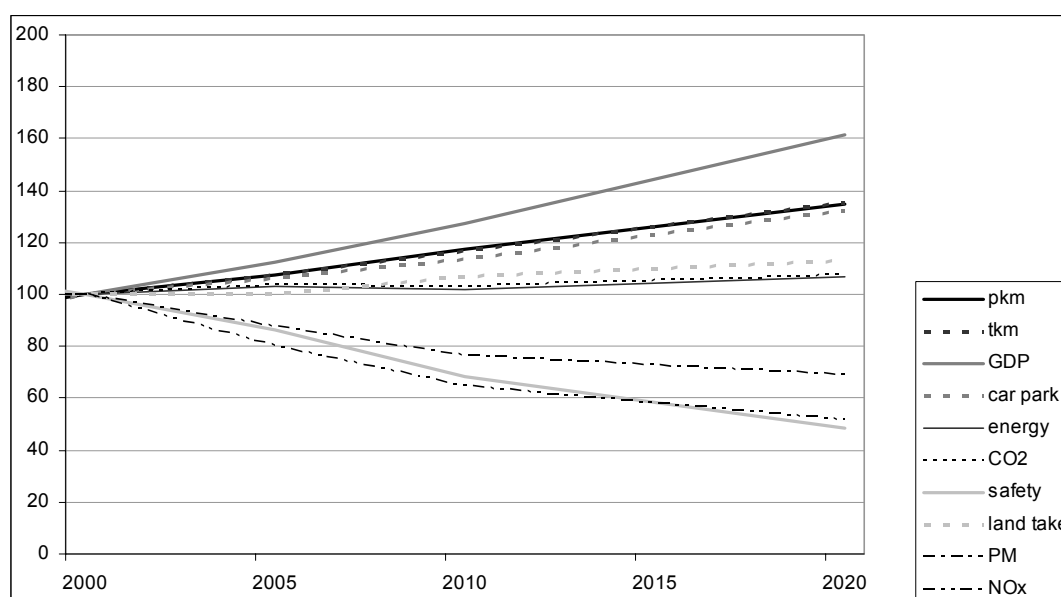
Under the most likely scenario, the overall freight demand growth for inland modes (i.e. road, rail and inland waterway) when measured in tonne-kilometres are likely to be between 17%-22% for the period

2000-2010, and between 36-45% for 2000-2020¹. The road tonne-km growth is likely to be between 21-26% for 2000-2010, and 43-55% for 2000-2020. Rail tonne-km growth is to be between 3-8% for 2000-2010, and 11-13% for 2000-2020. Short sea shipping demand, when measured in total tonnes received at the ports, is likely to grow by 16 and 36% respectively for 2010 and 2020. This suggests that the policy measures under this scenario are likely to reverse the decline of rail freight which occurred during the 1990s, but they would not be sufficient to achieve the original White Paper target of retaining the modal split pattern of 1998 for freight demand for EU25 as a whole.

The White Paper objectives will not be reached, but progress has been made

The figures below summarise the economic, social and environmental consequences of the White Paper measures, for the expected implementation levels in 2010 and 2020.

Figure 1: Transport performance in EU25 for the most likely implementation of the White Paper measures, relative to 2000(=100)



Almost all indicators show a remarkable progress in the right direction. Road safety has improved greatly since 2001. Emissions have dropped. Rail freight transport is growing. As expected, the different future scenarios considered have an increasing degree of impact, with more ambitious policy implementation producing better outcomes.

The accessibility of the regions will increase, the full White Paper implementation leads to a better accessibility of regions than the current implementation level. It should be kept in mind that some peripheral regions in NMS are not equally enjoying improved accessibility as others.

Implementing the measures of the White Paper is positively affecting the EU economic growth, particularly when marginal effects can be detected, although the impacts on GDP and employment are quite small. This moderately positive impact is higher when the investment and policy measures are well integrated and charging policies are compensated by a proportionate reduction of direct taxes.

¹ All figures quoted in this paragraph refer to EU25.

According to the safety analysis, none of the Member States will reach the 50% reduction in 2010. Some states are approaching the objective (Latvia, France, Portugal). For the 25 EU Member States the overall predicted reduction is 27%. In case of a full implementation of the White Paper, including rigorous measures as e-safety, it is estimated that the EU as a whole the objective will be reached in 2010.

An almost stable energy consumption and CO₂ exhaust emissions is predicted. The stableness of the transport emissions is mainly because the transport activity growth will be compensated by increases in the fuel efficiency for all road vehicles – a measure not included in the White Paper.

The major driver for the future large reduction in conventional emissions is the introduction of road vehicles emission and fuel standards, again a measure that not belongs to the White Paper.

This analysis shows also that the target of decoupling transport growth from economic growth does not influence the sustainability effects of transport. It should be revised towards a decoupling of the negative consequences of traffic, not traffic itself.

The next steps

The results of the mid-term assessment does not give cause for large changes in transport policy. It is too early to conclude that another package of measures or a drastically revision of objectives is needed. The objectives and measures proposed in the White Paper in 2001 are still valid and should, if implemented rigorously, help to produce the desired impacts, although the magnitude of the impacts remains uncertain. However, the policy scenario analysis showed that only a small part of the potential policy impact is achieved if the White Paper is partially implemented, most of the impact is only achieved when the White Paper is fully implemented or when the extended policy scenario is implemented. It must therefore be concluded that a stronger policy effort is needed to implement also the more difficult, but also more effective, measures, most importantly pricing measures such as infrastructure pricing, kerosene tax and airport charges.

Implementation

It may be worthwhile to focus in the second period of the White Paper on implementation in the Member States, trying to overcome local political or financial barriers by building in incentives. A good example is the SESAME project that is a technological initiative of industrial partners that builds upon the new legislation on the Single European Sky. Another example is the Marco Polo initiative that enables stakeholders to achieve multimodality. A closer participation of local stakeholders, both public and private, can accelerate policy implementation and shorten the time between adoption of legislation and observation of impacts.

Pricing

The biggest failure in implementation of the White Paper proposals is the failure to implement appropriate Social Marginal Cost Pricing for all transport modes, in order also to deal efficiently with the environmental issues (and taking into account the present and foreseeable price and taxation of oil products). Achieving agreement on progress here may need new approaches for the use of revenue. There is a need to reassure industry that it will not be made less competitive by the move and to buy off opposition from peripheral countries. Within the rail sector, the diversity of infrastructure charging regimes and the high charges in some countries – particularly new Member States – are a problem. The latter might be tackled

by providing support for infrastructure investment and a more efficient pricing for the competing modes, given the high opportunity cost and general inefficiency of public subsidies to operations.

Trans-European Network

The Commission has successfully revised the TEN-T guidelines and financing rules in line with its timetable. The result is a 600 billion euro investment programme stretching from now up to 2020, with a concentration of EU financing particularly on cross-border projects. Implementation at the local level, however, is proceeding at a slower than planned rate. Financing appears to continue to be a major obstacle, as national governments with competing claims on their resources struggle to prioritise funds for TEN-T projects. Whilst some progress has been made towards revising the Eurovignette and creating a new source of funds for TEN-T projects, the lack of success with the implementation of infrastructure charging has meant that a potentially key source of finance for the TEN-T has not become available. Further efforts to progress the Commission's proposals on infrastructure charging are recommended, but in the face of continued financing constraints, attention should also be maintained on further enhancing the appraisal and prioritisation of TEN-T projects.

Technology

A third important issue is recent development in communication technology, that can bring forward inland shipping (where the implementation of River Information Systems can improve travel times) and short sea shipping (where satellite navigation can help reducing customs formalities) dramatically. Similar opportunities are found in road and rail transport (dynamic travel information can reduce travel times) and in air transport (modernizing the European air traffic control infrastructure can reduce congestion in the air).

Safety

For safety the White Paper is on the right track. The goal of reducing the number of road victims by half will however not be reached, unless more robust and effective measures are taken, measures that are more likely to succeed.

Air and rail

Air transport is a rapidly growing contributor to climate gases and for this respect largely unregulated. At airports noise and capacity problems are compounded by the growth. Both issues should have more emphasis; future growth should be accompanied with an internalization of external costs that the air transport sector bears its own costs. Charging and financing are only one possibility to do this. Then future growth may be further encouraged. More progress in global liberalization and in the slot allocation procedures are also strongly recommended, in order to extend the benefit of competition to more users.

Rail reform based on open access is making good progress in the freight sector, although more slowly than might have been anticipated in the White Paper. Continuing to press existing policies appears the right approach here. The diversity of infrastructure charging regimes and the high charges in some countries – particularly new Member States – are a problem. The latter might be tackled by making support for infrastructure investment conditional on lower rail infrastructure charges.

I Introduction

With its ‘White Paper on Transport: Time to Decide’, the Commission is proposing an Action Plan aimed at bringing about a transportation policy and a transportation network that increases the competitiveness and efficiency of Europe, including all modes of transport. It proposes a strategy designed in particular to revitalise railways and other alternative modes of transport to road, which will enable to gradually break the link between transport growth and economic growth in order to reduce pressure on the environment and congestion without restricting the mobility needed for competitiveness. The White Paper introduces a large amount of smaller goals and more than 70 measures needed to achieve the goals. Some objectives include quantitative targets while most objectives remain qualitative. Here it is aimed to give a consistent and unambiguous summary of the objectives, policies and measures introduced in the White Paper in order to enable policy evaluation.

The White Paper has proposed a number of measures for each of the 12 policy guidelines. The 12 policy guidelines can therefore not only be seen in terms of key-objectives but also in terms of a policy package. In this section the packages of measures that belong to each of the 12 policies are distinguished.

The ASSESS project, which is summarised in this report, provides the technical support to the Commission services for the “Assessment of the contribution of the TEN and other transport policy measures to the mid-term implementation of the White Paper on the European Transport Policy for 2010”.

The scope of the ASSESS study are the measures and objectives that were stated in the White Paper. In particular, the ASSESS project has assembled all main sources of quantitative information at the European level to carry out an assessment of both the achievements to date (mid 2005), the possible policy implementation scenarios to the year 2010, and the longer term prospects to the year 2020.

The analysis accounts for the economic, social and environmental consequences of the proposed measures and their contribution to sustainable development objectives. It provides also a detailed analysis of those effects of enlargement likely to affect the structure and performance of the EU transport system.

Chapter II gives an overview of the **implementation** of these policies and measures in the EC and the Member States. Since this part of study provides a picture of which are the main difficulties in White Paper implementation, it also gives some useful suggestions concerning what should be done to overcome these obstacles. This chapter also gives an idea to what extent will the White Paper contribute to improving the transport situation in 2010.

Chapter III is the conclusion of the **indicator assessment** of the White Paper objectives. In this chapter, the White Paper objectives are analysed for 4 White Paper scenarios in an increasing degree of ambition. The objectives that cannot be achieved and the conflicting objectives are pointed out.

Chapter IV gives the conclusion on the **challenges** from a changing world, as the EU enlargement, globalisation and security, financial issues and the political dimension.

The last chapter V gives the **recommendations**, based on the assessment of the White Paper measures, the indicator assessment and the challenges in a changing world.

II Implementation of the White Paper measures

II.1. Introduction

In this chapter the objectives and measures of the White Paper are introduced and the implementation till 2005 of the 12 White Paper policies is assessed. In addition, this chapter gives an overview of the most likely implementation by 2010.

The chapter aims to evaluate the advancement of the implementation by the European Commission and by the Member States. Moreover, it estimates the impact of other EU policy areas to the achievement of the White Paper objectives.

For each policy it is assessed how far the measures proposed in the White Paper have been advanced. Four scoring categories are used.

1. No advancement: policies that have not been given a follow up. The status of the policy is not beyond the proposal stage as laid down in the White Paper.
2. Low advancement: policies where implementation activities are low. With regard to the Commission this is the case when the policy has been given a follow-up but this has not yet resulted in directives or regulations. Most of the policy is still in the proposal phase. With regard to the Member States a policy is given a low implementation score when the policy is part of the local debate but there are no signs of policy implementation by means of new legislation etc.
3. Medium advancement: policies where implementation activities are medium. This is the case when there is EC or Member State legislation and therefore at least part of the policy has been implemented but not yet all measures are achieved, either because the directives and regulations adopted do not go as far as the White Paper proposed or because some measures within the policy are lagging behind.
4. High advancement: policies that have a high implementation. In this case almost all of the measures proposed in the White Paper must have been given a follow-up by means of approved legislation by the European Parliament and Council and/or, if necessary, adoption in national legislation in most Member States.

It must be noted that not all Member States started at the same time with the implementation. In the EU15 the level of implementation in 2005 is the result of a five year period, while for the new Member States, which joined the EU in 2004, the evaluation only reviews a period of one year. These different timings in policy implementing also influences the forecast put forward for the year 2010.

The chapter starts with a overview of the objectives and measures of the White Paper (sections II.2 and II.3). Then successively the implementation activities at the European Commission and the Member States (sections II.4 and II.5).

The sections II.6 through II.9 give a detailed analysis of the implementation of the White Paper measures between 2001 and 2005, and an overview of the expected trends up to 2020.

II.2. Objectives of the White Paper on Transport

This section presents a summary of the objectives, policies and measures in order to enable policy evaluation. The core of the White Paper consists of four chapters that each introduce one action priority of the Commission. The following four action priorities are distinguished.

II.2.1. Action priority 1: Shifting the balance between modes of transport

The White Paper argues that increasing success of road and air transport is resulting in ever worsening congestion, while, paradoxically, failure to exploit the full potential of rail and short-sea shipping is impeding the development of real alternatives to road haulage. This persisting situation is leading to an uneven distribution of traffic generating increasing congestion, particularly on the main trans-European corridors and in towns and cities. To solve this problem, the White Paper aims to gradually break the link between road transport growth and economic growth by shifting the balance between the modes towards the more sustainable transport modes, i.e rail transport and maritime transport (incl. short sea shipping). For the period between 1998 and 2010 the White Paper measures aim to result in at a road haulage growth of 35% and a passenger car transport growth of 21% against a rise in GDP of 43% (p. 16).

To achieve the general objective of shifting the balance between the modes of transport the Commission introduced a number of policy guidelines. The policy guidelines belonging to the first action priority are:

- 1 *Improving quality in the road transport sector.* Protecting carriers from pressure from consignors² and bringing about modernization of the way in which road transport services are operated, while complying with the social legislation and the rules on workers' rights.
- 2 *Revitalizing the railways.* Opening up the markets, not only for international freight services, but also for cabotage on the national freight markets and for international passenger services. And second, restoring the credibility, in terms of regularity and punctuality of this mode, particularly for freight. It should enable to make rail transport more competitive in the transport system, also considering the context of the enlargement³.
- 3 *Striking a balance between growth in air transport and the environment.* Reorganisation of Europe's sky and ensuring the expansion of airport capacity remains subject to demands of reduction of noise and pollution caused by aircraft.
- 4 *Promoting transport by sea and inland waterway.* Reinforcing the position of these two modes by improving infrastructure and harmonizing social rules and technical requirements.
- 5 *Turning intermodality into reality.* Technical harmonisation and interoperability between systems, particularly for containers and support for innovative initiatives.

Large events that occurred after the publishing of the White Paper (the attacks on the Twin Towers on 11/9/2001 and the maritime accidents of the Erika and the Prestige) have resulted in the adoption of an extra guideline in the field of security and maritime safety. The objectives⁴ are improvement in maritime safety in order to prevent large scale disastrous accidents and improved aircraft safety and management of air navigation. These objectives were already included under policy guideline 3 and 4 but became more prominent due to the event mentioned above.

² White Paper, pg. 25: In this context, harmonisation of transport contract minimum clauses regarding the passing-on of costs should help protect carriers from pressure from consignors. In particular, transport contracts should include clauses allowing, for example, revision of tariffs in the event of a sharp rise in fuel prices.

³ Page 88 of the White Paper says: Every effort must therefore be made to convince the countries in question of the need to maintain the railways' share of the freight market at a high level, with a target of around 35 % for 2010. And: Maintaining the modal share of the railways in the candidate countries will also require even firmer action on road transport.

⁴ Source: DGTREN, Energy and Transport, Report 2000-2004.

II.2.2. Action priority 2: Eliminating bottlenecks

The White Paper argues that unless infrastructure is interconnected and free of bottlenecks, to allow the physical movement of goods and persons, the internal market and the territorial cohesion of the Union will not be fully realised. Even though the European Union has adopted an ambitious policy on the trans-European network a number of bottlenecks remain on the main international routes. Therefore, the White Paper aims to unblock the major routes, among others by mobilizing enough capital.

The related policy guideline mentioned in the White Paper is:

- 6 *Building the trans-European transport network.* The main aims are: removing the bottlenecks in the railway network, completing the routes identified as the priorities for absorbing the traffic flows generated by enlargement, particularly in frontier regions, and improving access to outlying areas. Priority is given to freight and a high-speed network for passengers. The main obstacle to carrying out infrastructure projects, apart from technical or environmental considerations, remains the difficulty of mobilising capital. To overcome this problem, the White Paper argues that innovative methods of public-private funding must be applied.

The guideline contains a number of more detailed objectives, such as

- completing the routes identified as the priorities for absorbing the traffic flows generated by enlargement, particularly in frontier regions, and improving access to outlying areas
- developing a high-speed rail network, removing the bottlenecks in the railway network
- developing motorways of the sea and airport capacity, including sections of pan-European corridors situated on territory of candidate countries
- developing multimodal corridors giving priority to freight
- developing traffic management plans for all main trans-European links
- completing the Alpine routes and providing a better passage of the Pyrenees by providing a high capacity rail line
- improve safety of long tunnels in the TENs
- enlarge private funding in the TENs

II.2.3. Action priority 3: Placing users at the heart of transport policy

The White Paper puts much emphasis on putting the users back at the heart of transport policy. Whether they be members of the public or transport sector professionals, everyone should enjoy a transport system that meets their needs and expectations. The White Paper puts the emphasis on, what is argued to be the users prime concern, road safety. Furthermore the paper mentions users costs, user rights and obligations and clean (public) transport accessibility. The policy guidelines belonging to this action priority are:

- 7 *Improving road safety.* Of all modes of transport, transport by road is the most dangerous and the most costly in term of human lives. This is also one of the few policy where the White Paper mentions a quantitative target. It is aimed to reduce the number of deaths on the road with 50% (p19, 66, 67).
- 8 *Adopting a policy on effective charging for transport.* Transport users are entitled to know what they are paying for and why. Therefore Community action aims at gradually replacing existing transport system taxes with more effective instruments for integrating infrastructure costs and external costs.
- 9 *Recognising the rights and obligations of users.* The White Paper aims to define users' rights in all modes of transport, while also considering whether in future it might also introduce user obligations. The White

Paper aims to lay the foundation for helping the transport users to understand and exercise their rights and in return also defining certain safety-related obligations.

- 10 *Developing high quality urban transport.* Noise and air pollution and its effects on health are of greater concern in towns and cities. Given the constraints of the principle of subsidiarity, the White Paper intends to encourage the exchange of good practice and taking regulatory initiatives to encourage public transport.
- 11 *Putting research and technology at the service of clean, efficient transport.* Adoption of stricter standards for noise, safety and emissions. And secondly integrating intelligent systems in all modes to make for efficient infrastructure management. Some quantitative targets are mentioned. By 2020 20% of the conventional fuels should be substituted by alternative fuels and by 2010 there should be a 5.75% biofuel penetration rate (p83).

II.2.4. Action priority 4: Managing the globalization of transport

Much of transport is regulated at the international level. Over the last two centuries, the regulatory framework has been built up within intergovernmental organisations. This is one reason why it is hard for the common transport policy to secure a position between, on the one hand, the production of international rules within established organisations and, on the other, national rules which often seek to protect domestic markets. With the enlargement and the extension of transport policy and trans-European network across the continent, Europe needs to rethink its international role. Firstly, the White Paper aims to make the enlargement of the Union a success by linking the new Member States to the trans-European network and secondly making the enlarged Europe more assertive on the world stage. The policy guideline belonging to this action priority is:

12. *Managing the effects of globalisation.* Reinforcing the position of the Community in international organisations in order to safeguard Europe's interests at world level. The White Paper puts emphasis on achieving independence in the field of satellite radio navigation.

This includes:

- Having a single voice of the EU in intergovernmental organisations which govern transport
- Coordinating air transport agreements with non-European countries (p94)
- Developing an European satellite navigation system (GALILEO)

II.3. Measures

The White Paper has proposed for each of the 12 policy guidelines a number of measures. Table 3 gives an overview of the action priorities, policies, and measures of the White Paper.

Table 3: Objectives, policies and measures of the White Paper

Objective		
Policy	Measure	
Action priority 1: Shifting the balance between modes of transport		
1. Improving quality in the road transport sector	1	Harmonise clauses in commercial road transport contracts
	2	Driving restrictions on heavy goods vehicles on designated roads
	3	Training of professional drivers
	4	Social harmonisation of road transport
	5	Introduction of the digital tachograph
2. Revitalizing the railways	6	First railway package: separated management of infrastructure and services, opening international services in TENs
	7	Second railway package: opening up the national and international freight market
	8	Second railway package: ensuring a high level safety for the railway network
	9	Updating the interoperability directives on high-speed and conventional railway

Objective	
Policy	Measure
	networks (ERTMS)
	10 European Railway Agency
	11 Third railway package: certification of train crews and trains on the Community rail network
	12 Third railway package: gradual opening-up of international passenger services
	13 Third railway package: quality of rail services and users' rights
	14 Third railway package: improving quality of the rail freight services
	15 Enter the dialogue with the rail industries in the context of a voluntary agreement to reduce adverse environmental impacts
	16 Support the creation of new infrastructure, and in particular rail freight freeways
3. Striking a balance between growth in air transport and the environment	17 Single European Sky
	18 Technical requirements in the field of civil aviation and establishing a European Aviation Safety Agency
	19 Air transport insurance requirements
	20 Harmonisation of airport charges
	21 Introduction of market mechanism in slot allocation procedures on Community airports
	22 Community framework for airport noise management
	23 Protection against subsidisation and unfair pricing practices in the supply of air services from third countries
	24 Safety of third country aircraft
	25 Air service agreements with third countries
	26 Airport capacity expansion
	27 Introduction of kerosene taxation
	28 Introduction of differential en route air navigation charges
4. Promoting transport by sea and inland waterway	27 Motorways of the seas
	28 Port services liberalisation
	29 Simplify sea and inland waterway custom formalities and linking up the players in the logistic chain
	30 Ship and port facility security
	31 European Maritime Safety Agency
	32 Double-hull oil tankers
	Penal sanctions for ship source pollution
	33 Oil pollution damage compensation fund
	34 Transfer of ship register
	35 Training of seafarers
	36 Eliminating bottlenecks in inland waterway transport
	37 River Information System
	38 Greater harmonisation of boatmasters' certificates
	39 Social legislation inland waterway transport
	40 Port state controls
	41 Sulphur content of marine fuels
5. Turning intermodality into reality	42 Marco Polo Programme
	43 Intermodal Loading Units and freight integrators
Action priority 2: Eliminating bottlenecks	
6. Building the Trans-European transport network	44 Trans European Network projects
	45 Funding of TENs
	46 Tunnel safety
	72 TEN infrastructure in the candidate countries
	73 Funding of infrastructure in the New EU Member States
Action priority 3: Placing users at the heart of transport policy	
7. Improving road safety	47 European Road Safety Action programme
	48 Harmonisation of road safety checks and penalties
	49 "Black Spots" on TENs
	50 Seat and head restraints
	51 Tackling dangerous driving
	52 Technical investigations of the causes of road accidents
	53 Harmonisation of driving licensing systems
	54 Speed limitation devices
	55 Intelligent transport systems and e-Safety
	56 Pedestrian and cycling protection

Objective			
Policy		Measure	
8. Adopting a policy on effective charging for transport	57	Infrastructure charging covering all transport modes and internalising the external costs	
	58	Uniform commercial road transport fuel taxation	
	59	Electronic road toll system (interoperability)	
	60	Harmonising VAT deductions	
	61	Taxation of passenger cars according to environmental criteria	
	62	Taxation of energy products and exemptions for hydrogen and biofuels	
	63	Introduction of a minimum share of biofuels consumption in road transport	
9. Recognizing the rights and obligations of users	65	Compensation of air passengers	
		Information for air passengers, assistance for persons with reduced mobility	
	66	Extending protection of users' rights to other transport modes	
	67	Intermodality for people	
10. Developing high-quality urban transport	68	Public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterway	
	69	Support for pioneering towns and cities (CIVITAS initiative)	
	70	Promote the use of clean vehicles in urban public transport	
11. Putting research and technology at the service of clean, efficient transport	71	Promotion of good urban transport practices	
	64	European Research on new clean car technologies and ITS application to transport	
Action priority 4: Managing the effects of globalisation			
12. Managing the effects of globalization	74	Develop administrative capacity in the candidate countries	
	75	EU external relations in the transport sector	
	76	Galileo programme	

* Measures are derived from the INDIC study.

II.4. Advancement of implementation at the European Commission

The assessment of the implementation activities resulting from strategic policy papers is often difficult. Strategic policy is usually comprehensive and somewhat holistic. It often lacks clear quantified objectives and an action program with concrete measures. To some extent the White Paper on transport is an exception since there is an action program with concrete measures. However, also in this action program some policy objectives and measures miss detail and they often describe a development path rather than a desired end situation. Especially in such cases it is difficult to assess to what extent a piece of legislation, which is often the result of multiple adaptations and compromises, does still fully reflect the intention and ambition of the White Paper. The assessment of the advancement is therefore rated with a four-point scale: no, low, medium, and high advancement and is partially based on expert judgement with regard to the conformance between new legislation and the intention of the White Paper.

Almost on all measures proposed in the White Paper there has been some kind of follow-up activity in the period till 2005. Table 4 shows the output with regard to legislation. On almost all policies there have been regulations, directives or regulations approved by the European institutions. In general all this legislation does come into force immediately or has to be implemented by Member States⁵. Most legislation that has been adopted aims at the maritime transport and at, although to a lesser extent, air transport and railway transport. Much new legislation in the maritime sector is aiming at safety and security, as a result of the Erika packages and the threat of international terrorism.

⁵ A regulation does not need implementation in national legislation and is on the moment of approval by the European institutions directly applicable in all Member States. A directive has to be translated by Member States in national legislation within two or three years after approval of the directive by the European institutions.

Of course not all implementation activities are aiming at legislation. Especially the TEN projects and the policies aiming at developing high-quality urban transport and putting research and technology at the service of clean, efficient transport are realized by co-financing decisions and research and support programmes such as CUTE, CIVITAS and the 5th and 6th research framework of the European Commission. In the meanwhile, there has also been a proposal for the 7th research framework⁶ where transport plays an important role.

Table 4: Number of pieces of legislation implementing the EC-White Paper policies (Status July 2005)

	Regulations	Directives	Decisions	Proposals
1. Improving quality in the road transport sector	3	2		3
2. Revitalizing the railways		7	3	3
3. Controlling growth in air transport	10	3	1	1
4. Promoting transport by sea and inland waterway	6	9	4	6
5. Turning intermodality into reality	1			2
6. Building the Trans-European transport network	1	1	2	
7. Improving road safety		3		5
8. Effective charging for transport		3		1
9. Recognizing the rights and obligations of users	3			4
10. Developing high-quality urban transport				
11. Putting research and technology at the service of clean, efficient transport				
12. Managing the effects of globalization	2		1	2

New legislation and research, support and co-financing actions did advance considerably with regard to the implementation of the individual White Paper measures. In Table 5 the status of the measures is summarized. For more detail we refer to the annex which includes a detail assessment for each measure.

By now around 46% of the measures proposed in the White Paper have been implemented at the EU level. These are 36 of the 78 measures proposed. Moreover, another 15% of the measures has been partly realized which means that at least some directives or regulations have been approved while other parts are still pending.

In almost all policies there are measures in place by now. Especially with regard to promoting transport by sea and inland waterway there has been progress. Eight of the fifteen measures proposed have been realized by now and another 3 measures are partially realized. Also with regard to the TENs there has been much progress. All measures as proposed by the Commission have been realized (note that this does not imply that the projects are already finished, it merely says that the White Paper activities that have to be implemented by the EC are done).

At the same time there are also many measures still pending. On 21 measures there has been some progress. In these cases a proposal has been adopted by the European Commission but it is not yet approved by the European Council and the European Parliament. On another 9 measures progress is almost non-existent and no proposals have been adopted by the European Commission. With regard to the policies on ‘transport safety’ and ‘recognizing the rights and obligations of users’, implementation activities are lagging behind. More than half of the measures included under these policies did not result in approved legislation. Also with regard to ‘Controlling growth in air transport’ and ‘Turning intermodality into reality’ progress is low. The high number of regulations and directives with the policy ‘Controlling growth in

⁶ COM(2005)119 of 06 April 2005 – see Annex III of the report.

air transport' does not imply that much of the measures included in this policy are already realized or partially realized.

Table 5: Advancement of the White Paper implementation at the Commission (Status June 2005)

Policy	Nr	Measure	Advancement
Improving quality in the road transport sector	1	Harmonise clauses in commercial road transport contracts	
	2	Driving restrictions on heavy goods vehicles on designated roads	
	3	Training of professional drivers	
	4	Social harmonisation of road transport	
	5	Introduction of the digital tachograph	
Revitalizing the rail-ways	6	First railway package: separated management of infrastructure and services, opening international services in rail freight TENs	
	7	Second railway package: opening up the national and international freight market	
	8	Second railway package: ensuring a high level safety for the railway network	
	9	Updating the interoperability directives on high-speed and conventional railway networks (ERTMS)	
	10	European Railway Agency	
	11	Third railway package: certification of train crews and trains on the Community rail network	
	12	Third railway package: gradual opening-up of international passenger services	
	13	Third railway package: quality of rail passenger services and users' rights for international services	
	14	Third railway package: improving quality of the rail freight services	
	15	Enter the dialogue with the rail industries in the context of a voluntary agreement to reduce adverse environmental impacts	
	16	Support the creation of new infrastructure, and in particular rail freight freeways	
Controlling growth in air transport	17	Single European Sky	
	18	Technical requirements in the field of civil aviation and establishing a European Aviation Safety Agency	
	19	Air transport insurance requirements	
	20	Harmonisation of airport charges	
	21	Introduction of market mechanism in slot allocation procedures on Community airports	
	22	Community framework for airport noise management	
	23	Protection against subsidisation and unfair pricing practices in the supply of air services from third countries	
	24	Safety of third country aircraft	
	25	Air service agreements with third countries	
	26	Airport capacity expansion	
	77	Introduction of kerosene taxation	
	78	Introduction of differential en route air navigation charges	
Promoting transport by sea and inland waterway	27	Motorways of the seas	
	28	Port services liberalisation	
	29	Simplify sea and inland waterway custom formalities and linking up the players in the logistic chain	
	30	Ship and port facility security	
	31	European Maritime Safety Agency	
	32	Double-hull oil tankers	
		Penal sanctions for ship source pollution	
	33	Oil pollution damage compensation fund	
	34	Transfer of ship register	
	35	Training of seafarers	
	36	Eliminating bottlenecks in inland waterway transport	

	37	River Information System	
	38	Greater harmonisation of boatmasters' certificates	
	39	Social legislation inland waterway transport	
	40	Port state controls	
	41	Sulphur content of marine fuels	
Turning intermodality into reality	42	Marco Polo Programme	
	43	Intermodal Loading Units and freight integrators	
Building the Trans-European transport network	44	Trans European Network projects	
	45	Funding of TENs	
	46	Tunnel safety	
	72	TEN infrastructure in the candidate countries	
	73	Funding of infrastructure in the New EU Member States	
Improving road safety	47	European Road Safety Action programme	
	48	Harmonisation of road safety checks and penalties	
	49	"Black Spots" on TENs	
	50	Seat and head restraints	
	51	Tackling dangerous driving	
	52	Technical investigations of the causes of road accidents	
	53	Harmonisation of driving licensing systems	
	54	Speed limitation devices	
	55	Intelligent transport systems and e-Safety	
	56	Pedestrian and cycling protection	
Adopting a policy on effective charging for transport	57	Infrastructure charging	
	58	Uniform commercial road transport fuel taxation	
	59	Electronic road toll system (interoperability)	
	60	Harmonising VAT deductions	
	61	Taxation of passenger cars according to environmental criteria	
	62	Taxation of energy products and exemptions for hydrogen and biofuels	
	63	Introduction of a minimum share of biofuels consumption in road transport	
Recognizing the rights and obligations of users	65	Compensation of air passengers	
		Information for air passengers, assistance for persons with reduced mobility	
	66	Extending protection of users' rights to other transport modes	
	67	Intermodality for people	
Developing high-quality urban transport	68	Public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterway	
	69	Support for pioneering towns and cities (CIVITAS initiative)	
	70	Promote the use of clean vehicles in urban public transport	
Putting research and technology at the service of clean, efficient transport	71	Promotion of good urban transport practices	
	64	European Research on new clean car technologies and ITS application to transport	
Managing the effects of globalization	74	Develop administrative capacity in the candidate countries	
	75	EU external relations in the transport sector	
	76	Galileo programme	

	No advancement, the status of the policy is not beyond the proposal stage as laid down in the White Paper
	Low advancement, most of the policy is still in the proposal phase. There is not yet much approved legislation
	Medium advancement, part of the policy has been implemented by approved directives/ regulations.
	High advancement, almost all of the measures proposed has been implemented by means of approved legislation

In general it can be concluded that the advancement at the EC level of the implementation activities is mixed. Implementation of 46% of the measures proposed and another 15% of the measures are likely to be implemented on the short term seems in conformance with the expectations at a mid-term review. However, two critical notes need to be placed. Firstly, the measures that are not implemented are often the most difficult but influential measures, for instance the pricing measures. Moreover, for some of these measures with high expected impact there are no signs that implementation will be realized in the period 2005-2010 (for example with regard to taxes on kerosene). Secondly, often the measures define a development process and a clear end goal is missing (for example promoting waterborne transport without aiming to reduce environmental impacts). In such cases it remains unclear to what extent the approved directives and regulations do indeed match the ambition of the White Paper. The review identified that there has been some advancement but it remains indefinite whether it is enough to meet the ambitions of the White Paper of 2001.

II.5. Advancement of implementation in the Member States

Many of the White Paper measures need adoption of European legislation in national legislations. Therefore, a scan of Member States activities has been made and the 12 policies are rated, for each European country, according to the status of the national implementation activities. The score per country and per policy for the years 2005 and 2010 are included in Table 6 and Table 7 below. The full report of the Member States policies review constitutes Annex II of the ASSESS project.

The analysis has been done for both EU15 and the new Member States. The fact that the dates of White Paper publication (2001) and the latest EU enlargement (2004) differ has an impact on the assessment of the implementation of the White Paper priorities and measures. In the new Member States, the implementation level cannot be treated separately from the processes of transformation, which still have not been completed in several areas. Strictly analysing, these countries had only one year for implementation, even though the process of the adjustment of the candidate countries legal environment to *acquis communautaire* has begun much more earlier. Therefore, the adaptation processes before 1st of May 2004 are also considered in this analysis⁷.

⁷ For more information about new Member States (policies, implementation issues, barriers, effects), see Annex XIX.

Table 6: Implementation of the 12 policies in the EU Member States in the year 2005

Policies	EU15															new Member States									
	AT	BE	DK	FI	FR	DE	GR	IE	IT	LU	PT	ES	SE	NL	UK	CY	CZ	EE	HU	LV	LT	MT	PL	SK	SI
1 Improving quality in the road transport sector																									
2 Revitalizing the railways																na						na			
3 Controlling the growth in air transport																									
4 Promoting transport by sea and inland waterway																									
5 Turning intermodality into reality																na						na			
6 Building the Trans-European transport network																									
7 Improving road safety																									
8 Adopting a policy on effective charging for transport										na												na			
9 Recognizing the rights and obligations of users	na																								
10 Developing high-quality urban transport																na									
11 Putting research and technology at the serv. of clean, eff. transp.	na			na			na	na	na	na		na	na	na	na	na					na		na	na	
12 Managing the effects of globalization	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Table 7: Implementation of the 12 policies in the EU Member States in the year 2010

Policies	EU15															new Member States									
	AT	BE	DK	FI	FR	DE	GR	IE	IT	LU	PT	ES	SE	NL	UK	CY	CZ	EE	HU	LV	LT	MT	PL	SK	SI
1 Improving quality in the road transport sector																									
2 Revitalizing the railways																na						na			
3 Controlling the growth in air transport																									
4 Promoting transport by sea and inland waterway																									
5 Turning intermodality into reality																na									
6 Building the Trans-European transport network																									
7 Improving road safety																									
8 Adopting a policy on effective charging for transport										na												na			
9 Recognizing the rights and obligations of users	na																								
10 Developing high-quality urban transport																									
11 Putting research and technology at the serv. of clean, eff. transp.	na			na			na	na	na	na		na	na	na	na	na					na		na	na	
12 Managing the effects of globalization	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

	None
	Low
	Medium
	High

n.a. = not applicable/ no data available

Among the European Union Member States, road transport still takes the lion share. Accordingly, national governments are gradually adopting the measures needed to improve the quality of the sector (policy 1). Delays could rise consequently to the fact that this objective needs specific and new legal instruments, in order to comply with the EU directives. Countries are also actively involved in promoting competing modes of transport, by the revitalizing of the railways and promoting transport by sea and inland waterway (policies 2 and 4). Concerning railways, the advancement of the market opening and the improvement of the network will be fundamental for the future success of the implementation of this policy. The improvement of port infrastructure quality and the effective adoption of some measure, which are at the moment only politically accepted, will be at the basis of the effective promotion of sea and inland waterway transport. Air transport (policy 3) still shows a fragmentation of air traffic control and the lack of an air navigation system organised at a European, rather than at national or local, level (which will definitely tackled by the Single sky legislation).

The building of the European transport network (policy 6) is of interest for all the Member States. The general favour about these projects derived also to the fact that for some States, specially the new ones, the TEN projects are the only chance to improve the national transport system. The obstacle to a faster implementation of this policy is linked to the lack of adequate financial resources: many of the TEN costs have been underestimated in the past and their increase could in the future influence their timing. The scarcity of resources claims for a more rational funds allocation, which could be the result of a process of projects prioritisation.

A good level of implementation has been recorded among the Member States concerning road safety (policy 7). This issue is central in almost all national transport plans and the adoption of specific measures has followed their political acceptance by domestic governments. More efforts seem to be needed in order to actively promote the transport user right defence (policy 9): only those sectors in which a competition system exists have fixed the relevant rules, while in the others non binding conventions still prevail.

Transport charging (policy 8) results the less implemented in all Member States. With the exception of a few national experiences, Member States are not actively involved in promoting this policy. Furthermore, the recent fuel cost increase could be a further obstacle to the acceptance of this policy. For the other policies grouped in the action priority 'Placing users at the heart of transport policy', delays are due to the scarcity of financial resources allocated.

With reference to policy 12, managing the effects of globalisation, no measures have been taken by the Member States due to the Galileo calendar at the EU level. Galileo will become operational in 2008 and there is no sign that this will be delayed, despite the fact that there are some funding problems with e.g. Germany.

II.6. Action priority 1: Shifting the balance between modes of transport

In this chapter, the assessment of the White Paper policies in Action priority 1 can be found.

II.6.1. Policy 1: Improving quality in the road transport sector

Road freight transport has a competitive advantage above other modes: it gives the opportunity to carry good all over the European Union with great flexibility. However, haulage companies compete fiercely against other modes and against each other, sometimes leading to their side-stepping the rules on working hours and authorisations and even the basic principles of road safety.

The White Paper measures for improving the quality in the road transport sector overcome these problems by enabling fair prices (i.e. prevent price dumping) by protecting carriers from consigners by enabling them to revise their tariffs in event of a sharp rise in fuel prices and by harmonising and tightening up inspection procedures in relation to social legislation and rules on workers' rights.

Most measures are implemented in EU15. The EU enlargement has caused a step backward, as the new Member States lack behind the EU15 schedule. However, through recently legal regulations, the NMS have been already or are going to be adjusted to directives adopted in the EU in 2002-2003 in this area. Practical implementation concern mainly international road enterprises, while the introducing and monitoring at the level of national road transport is lagging behind. Delays in implementing this policy have been recorded by Belgium, Finland and Greece. Luxembourg is quite far to implement this policy.

It is fair to say that most White Paper measures that aim to harmonise social conditions in the road transport sector in order to improve road safety, safeguard the health and safety of workers and prevent distortion of competition have been given a follow up and are realised or can be expected to be realised in 2010.

- Driving restrictions on heavy goods vehicles on designated roads is in 2005 already realised in some countries, and is expected to be fully implemented in EU25 in 2010. The harmonisation of the weekend bans however, is not of priority at the European level.
- Social harmonisation of road transport: although this measure consist of a few different parts, it is expected that in 2010 this measure is completely implemented.
- Training of professional drivers and introduction of the digital tachograph were already realised in 2005.

The only measure that is unlikely to be implemented before 2010, is the intention to harmonise clauses in commercial road transport contracts to protect carriers from pressure from consignors.

II.6.2. Policy 2: Revitalizing the railways

In terms of rail specific legislation since the White Paper, progress has been good. Policies for improving the performance of the railways by introducing competition for freight traffic within the sector and by improving inter operability are now largely in place with the adoption of the first two railway packages⁸, although liberalisation of domestic freight does not take place until 2007. In the passenger sector, open access for international passenger services is proposed but not yet agreed; the other commercial measure, the introduction of competitive tendering for subsidised or exclusively operated services, was first aban-

⁸ The third railway package has been voted by Parliament on September 28th 2005.

done due to the impossibility of reaching agreement on it. It has then been replaced by a revised proposal adopted by the Commission in July 2005. However, the measures that have been implemented do require separate freight and passenger accounts and the implementation of public service contracts for non commercial passenger services, which should increase transparency and improve the efficiency of management of passenger services, particularly in the new Member States where public service contracts are only starting to be implemented.

It will be seen that in terms of performance progress since the White Paper in the rail sector is less encouraging. Far from moving towards the mode split target of the White Paper, rail has continued to lose freight market share, although with some recovery of volumes in the last couple of years. In the passenger sector its market share has stabilised, with new high speed services being a major factor in this achievement. The progress of reform within the rail sector has been slow and investment in new capacity, particularly for freight traffic, is slow to take off. There is limited progress in multi-modal pricing policy.

There are however clear signs of progress. Effective competition has emerged on some key international corridors, most notably through the Alps. The activities of the Rail Net Europe consortium of infrastructure managers is improving the marketing of international paths, and the formation of the European Bulls consortium of private rail freight operators promises to spread competition. In France, two new operators have now been licensed and the first has started operating. Thus, it appears likely that the efficiency and quality of service of rail freight will improve over the coming years under the impact of greater competition and indeed it is possible that the scene has been set for very major changes over the next few years.

In the passenger sector, new high speed services plus greater efficiency in the provision of conventional services as a result of institutional reform and of the partial introduction of competitive tendering have already apparently stabilised rail mode share over recent years. Moreover, even in the late 1990s significant cost savings were achieved, and it seems likely that with the spread of competitive tendering for passenger services and on track competition for freight substantial cost reductions may be anticipated.

The current rail freight tonne-km show limited overall growth, but with a diversity of experience, Germany and the UK doing very well and France doing very badly. It is interesting that Germany and the UK are countries where complete open access to the freight market has already been the rule for a decade, whilst in France the first new entrant only started operation in 2005. In the absence of specific policy measures, this loss of market share is projected to continue, with a slight loss of rail traffic in absolute terms over the period to 2020. A modest growth in some countries is offset by continued losses in others, particularly France. However, according to the modelling exercise full implementation of the White Paper policy, which includes marginal social cost pricing on all modes as well as effective completion of the liberalisation of rail freight, leads to a substantially better rail performance, with traffic in 2020 27% above the 2000 level in the do-nothing scenario. Nevertheless, road freight continues to grow faster, and rail continues to lose market share.

On the passenger side, a do nothing policy results in continued slow growth, with traffic in 2020 15% above that in 2000. One reason for this slow growth is the development of low cost airlines. Marginal social cost pricing on all modes again has a positive impact on rail, taking the growth in rail traffic up to 2020 from 15% to 20% compared with the N scenario in 2020 (See F and E scenario, chapter III).

II.6.3. Policy 3: Controlling the growth in air transport

Air transport is expected to be the fastest growing mode of transport between 2000 and 2010. This poses very special challenges for transport policy, primarily in the areas of infrastructure expansion and environmental impacts but also on fair intra- and intermodal competition, strengthening of user rights and improvements of air safety.

The policy package “Controlling the growth in air transport” consists of 13 measures, which are specifically designed to address these challenges. The following analysis will show that these measures contribute to the objectives they have been designed for, but the analysis will also show that complex interactions exist and the implementation of certain measures requires the implementation of other measures to achieve a balance between different aspects, primarily competition and growth on the one hand and environmental protection on the other hand.

The elimination of bottlenecks in the air and on the ground has special priority to accommodate the growth of air transport in the coming years. The implementation of the Single European Sky (SES) is one element to enhance airspace capacity by reshaping the European air traffic control landscape. This measure has been implemented on a legislative level to a high degree and is well accepted by stakeholders and Member States. Also the practical implementation with the creation of functional airspace blocks is making progress. These blocks will be organised according to the traffic flows and constitute an improvement over today’s organisation oriented at national borders. It can be expected that the first functional airspace blocks will be operational by 2010. However, it can also be expected that the additional capacities that will be created by this measure will be filled up very quickly with the demand growing. Besides the enhanced capacity, the SES is also likely to reduce costs for airspace users, as this measure will enhance the efficiency of the air traffic control system. The number of en route control centres will be reduced and the introduction of air traffic management infrastructure, which will be compatible throughout Europe, will result in further cost reductions. The additional traffic that will be enabled by the SES initiative will also increase the environmental burden, making it therefore necessary to implement other measures to counteract these aspects. A shortcoming of the Single European Sky initiative is the fact that it neglects to create economic incentives in the provision of air traffic control services. This is likely to reduce the efficiency of the measure, as not necessarily the most efficient air traffic control providers will have the opportunity to provide their services. However, the legislative basis for the provision of air traffic control services in every Member State has principally opened up the possibility for mergers and acquisitions that could be one element to enhance economic efficiency of the air traffic control system.

With regards to capacity constraints on the ground, the scope of the EU to act is rather limited. Construction of new and expansion of existing airports is primarily a task for subsidiary levels, such as national governments or even regional or municipal authorities. As the scope of capacity expansion projects of airports is in many instances restricted due to legal and environmental controversies, potential alternatives such as the development of high speed train lines come into the focus of transport policy. Incentive for passengers to switch from air to railway can be created by a significant reduction of trip times. To achieve these reductions, investments in new railway lines dedicated for high speed passenger transport are inevitable. As funding of high speed train (HST) lines is a primary concern, the support given by the EU in the form of TEN-T is a valuable driver to achieve modal shift objectives. However, with a time horizon of 2010, the potential to increase HST connections is rather limited to several distinct markets, such as Madrid – Barcelona. For this city pair it can be expected that the market share of rail will increase dramatically when the new HST line will be inaugurated, which will reduce trip times from between 4.5 and 7 to 2.5 hours. For the airports in Madrid and Barcelona it can be expected that a considerable number of slots will be freed up, while for other airports like Amsterdam, Frankfurt or Munich the potential to free up

slots with a shift to high speed railway is limited to about 5 per cent of total movements. Even this modest effect would require spending billions of Euros to improve existing or to build new railway lines.

As the possibilities for the Commission to expand airport capacities in Member States are limited, another focus of the White Paper is to increase the efficiency of usage of existing capacities. For this reason it has been intended to create a framework for airport charging and to implement a reform of slot allocation procedures. The need to regulate airport charges will become in future more important as the extent of privatised airports is growing. So far, it is the distinct competence of national or regional authorities to oversee airport charges, but with its nature of an international market, a more harmonised approach could enhance fair competition between airports.

As far as slot allocation is concerned, the currently applied procedure with its focus on grandfathering has disadvantages regarding the economic efficiency and the contestability of capacity-constrained airports. These effects are expected to grow in the coming years, as mergers and the development of alliances are likely to strengthen the market powers of incumbent carriers, especially at their home hub airports. The Commission has launched a stakeholder consultation in 2004 and it can be expected that a new proposal will be adopted soon. When a new slot allocation procedure will enhance the contestability of hub airports, it is probable that a considerable number of incumbents' short-haul flights will be substituted by long-haul flights of new entrants, which in turn could have negative effects on the environment, for instance due to an increase in greenhouse gas emissions. Therefore, also in this case, a balanced approach with additional measures to mitigate these effects will be necessary.

In addition, a decisive factor for the structure of air transport markets are air transport agreements concluded between Member States of the EU and third countries. In the White Paper, one objective was to undertake efforts to remove nationality clauses that have resulted in a limitation of air traffic rights between a Member State and a third country, so that in many instances only airlines of the respective nations could offer their services. Another objective was to overcome individual negotiations between Member States and third countries, eventually to become substituted by central negotiations conducted by the Commission. As the decision of the European Court of Justice on 5th November 2002 has shown, the Commission was partly successful with these objectives. On the one hand, the ECJ decided that the nationality clauses indeed constitute an infringement of Community law and have to be adapted accordingly. On the other hand, the Court did not rule that the Commission automatically has the competence to negotiate air service agreements on behalf of the Member States. Nevertheless, the Council could transfer these competences from the Member States to the Commission, what it subsequently did for instance for negotiations with the USA. By 2010, it can be expected that the original objectives of the White Paper in this regard will be achieved to a very high degree. The result will be that mergers between two Community carriers will be facilitated and that the contestability of air markets will be increased in future. For instance, it is now conceivable that Irish or British low cost carriers will use their traffic rights to offer air services from Germany or Poland to the Ukraine. This will ultimately help to strengthen the European airline industry and will be beneficial for consumers and the economic ties between the EU and the concerned third countries. However, the realisation of the Open Aviation Area between the EU and the USA, which goes some steps further than traditional air service agreements and is expected to bring strong benefits, is connected with major obstacles that make it difficult to assess whether it is achievable by 2010. Again, the liberalisation of air service agreements will encourage further traffic growth and would therefore require the implementation of flanking measures that mitigate negative environmental effects.

Less convincing is the progress on environmental issues so far. Concerning the reduction of noise impacts, the new Directive 2002/30/EC is intended to reduce the impacts of noise primarily of marginally compliant aircraft with the means of operational restrictions, while noise at airports in general should be

fought against by a balanced approach of different measures to be implemented by the Member States. The open wording of the Directive actually does not prescribe concrete measures; therefore, the benefits for residents living near airports are to be seen. The reduction of noise by marginally compliant aircraft has been accelerated by the fact that these aircraft also have a relatively high specific fuel consumption and are retired due to high fuel prices.

To reduce the impacts of gaseous emissions from aviation that contribute to climate change, a new strategy of the Commission has evolved during 2005. It has prioritised the inclusion of aviation into the EU emissions trading scheme (EU-ETS), as herein lie economic and environmental benefits, which are more promising than the introduction of kerosene taxation and/or emissions-related surcharges on top of en route navigational charges. With the inclusion of aviation into the EU-ETS an emissions cap will be specified which could be reached at lowest possible cost due to the choice of either buying permits or introducing technology with lower emissions. This instrument is also widely supported by the airline industry, as it allows traffic to grow. Although still some obstacles have to be overcome to integrate aviation into the EU-ETS, it is likely that this measure can be implemented by 2010.

In the field of improvements of air safety, the creation of the European Aviation Safety Agency (EASA) is also widely regarded as positive. It is also a major step forward to establish the European Union as a counterweight to the USA in aviation safety policy. The development of EASA is a gradual process, probably also extending towards the safety of third country aircraft, airports and ATC in the coming years. Harmonisation and centralisation of the legal framework will help to reduce duplication on the Member State level, eventually resulting in transaction cost reductions. Although already today air transport by EU carriers is very safe in the international comparison, another objective associated with the foundation of EASA is to enhance overall safety levels throughout the EU.

Finally, one of the objectives of the White Paper was to strengthen user rights. For the air transport sector, new rules for compensation, care and assistance in case of denied boarding, long delays and cancellation have been implemented. These rules guarantee a high level of service for passengers, but are challenged by industry federations as over-regulating the subject. Nevertheless, it can be expected that the European Court of Justice will rule in favour of the current legislation.

At this point it is worthwhile to discuss the impacts of the aviation-specific measures concerning the towering objective to return in 2010 to the modal split of 1998. Actually, most of the measures implemented so far contravene this objective, as they aim either to reduce costs for airlines (SES, EASA) or make air travel more attractive for passengers (compensation rules, increase in safety). So far, no measures have been implemented on the EU-level that aim at the internalisation of social costs, which are caused by commercial air transport. These measures would most likely increase prices for air transport, probably resulting in a switch to other modes in certain instances.

However, the objective of a return to the modal split of 1998 is generally questionable. It has ever since been the objective of the European Union and the Commission to foster competition, in this particular case not only within the modes, but also between them. Aiming at a modal split target that is arbitrarily set will not even be able to cure the symptoms and will even less be able to eliminate the true problems. When the deficits of environmental legislation, foremost in the field of internalisation of externalities will be rectified, there would be no need to determine the modal split politically. For the field of air transport policy, this means that the internalisation of external effects is as important as infrastructure expansion and capacity enhancement. This must become a mandate for successful European transport policy, as it ultimately will achieve the Commission's key objectives: a competitive environment encouraging growth, while emphasising the need for sustainable development.

Besides the aspect of competition between the modes, also aspects of intermodal cooperation should be emphasised in future, as aviation is an integral part of the transport system. Attractive combinations of air transport and high speed rail for example could on the one hand reduce the need for short-haul feeder flights, freeing up slots for more attractive flights at congested hubs. But on the other hand it must also be mentioned that rail connections enhance the accessibility and subsequently the attractiveness of airports, leading to higher passenger volumes and negative repercussions on the overall environmental balance. These systems aspects again show that a highly differentiated set of economic, legal and political instruments is needed for “Striking a balance between growth in air transport and the environment”, as the White Paper outlines.

II.6.4. Policy 4: Promoting transport by sea and inland waterway

Sea and inland waterways have been underused in recent decades, but have recently envisaged a successful growth, thanks to such measures as eliminating bottlenecks, both regulatory and capacity, and to the growing congestion on the road network.

In general, the policy “Promoting transport by sea and inland waterway” have recorded a good level of implementation at the European level and at the local level.

II.6.4.1. Maritime transport

Most of the measures concerning maritime transport are implemented, or on their way to being implemented. It can be expected that most of the measures will be established by 2010.

Some measures are already implemented, or almost implemented:

- European Maritime Safety Agency
- Double-hull oil tankers
- Penal sanctions for ship source pollution
- Oil pollution damage compensation fund
- Training of seafarers
- Port state controls

Ship and port facility security

Security between ship and port has been enhanced by regulation, especially concerning trans-shipment. A proposal to enhance security in Community ports by setting security standards in port districts is likely to be approved before 2010.

Transfer of ship register

It is expected that this measure will be partly implemented in 2010. There has been practically no action on the tonnage-based taxation system, which should be an incentive for reflagging ships. The framework for reflagging has been setup but it is not clear how many ships are indeed reflagging.

Greater harmonisation of boatmasters' certificates

It is expected that this measure will be partly implemented in 2010. After having consulted with business representatives it was decided that the envisaged harmonisation was not needed at the moment. At this

stage the intention is not harmonisation but recognition of Community patent by the Rhine convention which will be achieved at most by 2010. In the longer term, the EU boatmaster certificate is still an objective.

Motorways of the seas

The objective of motorways of the seas is to make maritime transport more attractive. Freight transport is concentrated on a limited number of links, motorways of the sea, with well performing ports. By concentrating transport on some links, the viability of these links is improved. Maritime transport via motorways of the seas will also get cheaper and will attract part of the freight transport using other transport modes. Motorways of the sea are targeted to zones where there exists road congestion often aggravated by natural barriers

Motorways of the seas was added as a priority project to the TEN-T projects (COM (2003) 564) and was adopted as such by the European Parliament.

Member States investments in port infrastructure amounted to 19.6 billion euro between 1996 and 2001. Expenditures between 2002 and 2010 are estimated to be 18.5 billion euro (TEN Invest Final Report 2003 Planco).

The framework to realize motorways of the seas is in place. Also in Marco Polo there is substantial attention for motorways of the sea. Marco Polo II and the TEN-budget line are waiting for the approval of the new financial perspectives, in the meantime only studies and other minor actions are possible. The potential of those motorways seems to be considerable.

In spite of this potential success story, attention should be paid to the indirect effects of the measure:

- The global increase in traffic volume due to a cheaper transport. Global transport volumes will increase faster with the motorways of the seas projects than without them.
- The global increase in maritime traffic on the corridors and an increase in traffic speed. Safety on the busy sea lanes could become a problem then.
- The relatively poor environmental performance of maritime transport should be addressed, by setting minimum environmental criteria, particularly for air pollutant emissions.
- The potential risk of introducing unfair competition between ports should be considered.

Port services liberalisation

The objective of this measure is to increase efficiency and quality of port services. Increased efficiency and quality will lead to more attractive maritime transport and enhance its competitive position compared to other modes.

There is a clear desire to liberalise port services at the European Commission. However, due to the rejection of a compromise text by the European Parliament, a legislative framework is not in place yet. A new proposal has been prepared by the Commission taking numerous constructive amendments of the previous legislative process into account.

The implementation of the directive will have a dynamic effect on ports. Supplementary freight will therefore be shifted from land modes to short sea shipping. Precise estimates of the effect of port services liberalisation are nevertheless difficult to provide.

Simplified sea and inland waterway custom facilities

It is necessary to simplify the regulatory framework for maritime and inland waterway transport by encouraging in particular the creation of one-stop offices for administrative and customs formalities, in order to develop a framework in which seamless short sea shipping transport becomes possible.

A guide to customs procedures for short sea shipping was presented by the Commission in April 2002. Consultations have been organised European wide and ended in April 2003. In response to this, the Commission presented a working document on the modalities and procedures of the *Authorised Regular Shipping Service*.

As one of the first steps in *e-Customs*, some 3000 Customs offices in 22 countries have now implemented the New Computerised Transit System (NCTS) since mid-2003. Under the current system, the procedure relating to transport under the single administrative document (SAD) is replaced by electronic messages. Additional functionalities are planned to be introduced into the NCTS in the future.

The Communication also suggests adjusting the Customs Code so that electronic declarations and messages become the rule and paper-based declarations the exception. To achieve this will, however, take some time because the necessary data flows will have to be organised and compatible IT systems set up.

Some measures to simplify custom facilities are underway. The measures can of course reduce the administrative paperwork and so improve the relative competitive position compared to other modes.

Sulphur content of marine fuels and EU ship emissions policy

The objective of the policy is the reduction of the impact of ship emissions on local air quality and acidification through the reduction of the sulphur contents of marine fuels used in the European Union. The reason for this objective is that ships' emissions of SO₂ per ton-km are very high. If nothing had been done, ship emissions would equal 75% of SO₂ emissions of all land based sources in the EU. Furthermore, the abatement costs of emissions of sea going vessels are low compared to reductions of land based emissions.

A reduction in SO₂ emissions by maritime vessels will clearly be achieved thanks to the low sulphur directive voted on 13 April 2005. The reduction is more than 90% for port emissions and a quarter for the overall European emissions. By further strengthening the directive, there is still an enormous potential for further emission decreases.

The new directive concerns only reducing the sulphur content of the fuels, and therefore emissions of sulphur dioxide and particulate matter.. From an environmental and health point of view it is also necessary to reduce ship emissions of nitrogen oxides (NO_x), which are now also higher per tonne/km than other transport modes, and currently on course to exceed NO_x from all land-based sources combined by 2020. Ships can also achieve NO_x reductions in a very cost effective way compared to reductions from land based sources. Finally, reducing CO₂ emissions from shipping is another important issue to be addressed as it has not been addressed until now.

On current trends, the EU policy of promoting modal shift to waterborne transport is likely to increase overall air pollution emissions from the transport sector⁹, thereby increasing external costs to health and the environment, unless it is accompanied by significant improvements in ship emissions performance.

II.6.4.2. Inland waterways

- The TEN network for inland waterways is on schedule, and there are no signs that this will give problems towards 2010. It is expected that the river access of larger vessels will increase and this will impact upon the modal split.
- On simplification of sea and inland waterway custom formalities and linking up the players in the logistic chain: it is not likely that the one-stop offices will be realised before 2010. The rest of the measure is already executed in 2005.
- It is not expected that a social legislation regarding resting times and crew composition in inland waterway transport will be harmonised before 2010. The advantage of such an introduction is contribution to more equal competition within the inland navigation industry as well as its contribution towards higher safety levels in the industry. However, the impact on travel costs will be significant; the costs for labour are one of the main costs in running an inland waterway business. If the resting times or the crew composition changes it directly affects the costs of labour and following the travel costs.

Some Member States such as Austria and the Netherlands have advanced systems of RIS (River Information System), which makes this mode of transport still more reliable, efficient and accessible.. It is expected that the river information system will be voluntary (but not obligatory) in 2010 (although if Member States adopt a system it will have to be interoperable according to the RIS directive) and will therefore take more time to mature. Safe navigation applications will be operational by 2010 while logistic interfaces will be developed later.

II.6.5. Policy 5: Turning intermodality into reality

Marco Polo Programme

One of the measures to attain the White Paper objective of modal split change towards non-road modes is the establishment of the Marco Polo Programme with its adoption on 22 July 2003. The Programme's objective 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. To achieve this objective, the Programme supports actions in the freight transport, logistics and other relevant markets. These actions should contribute to maintain the distribution of freight between the various modes of transport at 1998 levels by helping to shift the expected aggregate increase in international road freight traffic of 12 billion tonne kilometres per year to short sea shipping, rail and inland waterways or to a combination of modes of transport in which road journeys are as short as possible. All segments of the international freight transport market are within the scope of the Programme.

The Programme runs from 2003 to 2006 with a budget of 100 € million for the EU25. Countries such as Norway, Iceland and Lichtenstein (EFTA) have joined the programme. Each additional fully participat-

⁹ The emissions per tonne-km of road transport (EUROIV-EUROV 40 ton heavy duty vehicles) are 50 times lower for SO₂, 2.5 times lower for NO_x and at least 3 times lower for PM compared to maritime transport.

ing country contributes to the available budget. The first call for proposals was published on 11th October 2003 and closed on 10th December 2003, the 13 successful projects concluded a contract in autumn 2004. The second call for proposals was published on 15th October 2004, with deadline for submission on 15th December 2004, projects from this call should have a contract in 2005. For each contract at least 250 million ton-kilometres should be shifted. The third call is recently opened and the fourth and last call is foreseen in summer 2006.

In 2004 the Commission presented a proposal COM (2004) 478 to establish a second, significantly expanded "Marco Polo" programme from 2007 onwards. Marco Polo II (2007-2013) includes new actions such as motorways of the sea and traffic avoidance measures. The programme, which has a budget of €740 million for 2007-2013, has been extended to countries bordering the EU. The Commission estimates that every €1 in grants to Marco Polo will generate at least a shift of 500 tonne kilometres from the road towards other modes (rail, inland waterways and maritime transport) and thereby create €6 in social and environmental benefits. The final form of Marco Polo II will depend on the outcome of the negotiations with the European Parliament and the Council.

The first two calls of Marco Polo, with respectively December 2003 and December 2004 as closing date, have resulted in respectively in 87 and 59 eligible proposals, with a request of 182.4 and 109.7 million euro subsidies. It can be concluded that based on the number of applications, the Marco Polo is received enthusiastically (even so that there is a risk that there are too many applicants with good ideas are disappointed and resulting in a less effective instrument). Regulations in Marco Polo are designed to assist in starting intermodal projects by providing funds until they reach the break-even point, and reduce thereby the risk for the "entrepreneur" in setting up an intermodal chain. In case of profits the subsidy will accordingly be reduced. The reaction to enlarge the budget in Marco Polo II is justified from the point of view of its success in amount number of applications. In Marco Polo II, also limited capital investment is allowed, thereby increasing the effectiveness of the programme.

In total the programme foresees a reduction of minimal 50 billion tonne kilometres from road transport in 2003-2006 (Marco Polo I in 3 years) and 350 billion tonne kilometres in 2007-2013 (Marco Polo II in 7 years). According to the information of the 13 contracted projects from the first call a shift of 12.2 billion ton kilometres will be realised which is funded with 15 million euro. Concluding, with 15% (15 million out of a total budget of 100 million) of the budget about 25% (12.2 million tonne-km out 50 million tonne-km) of the goal is realised the Marco Polo programme contributes clearly to attaining the White Paper goals.

Intermodal Loading Units and freight integrators

Due to the technical complexity of freight transport, the specific problems of organising intermodal transport and the differing needs of shippers, transport operators and society at large, Europe needs to further develop the skills of professional transport managers to integrate these different interests and organise sustainable door to door intermodal freight transport. The Commission calls such managers, whether they act alone as large and powerful freight forwarders, or whether they seek co-operation for the improvement of transport, and irrespective of the transport sector they are working in, "freight integrators". A suggested definition by the Commission is: "Freight Integrators are transport service providers who arrange door to door transportation by selecting and combining without prejudice the most sustainable and efficient mode of transport"

With transport costs being a large part of the total logistics costs (i.e. costs related door-to-door costs to the final customer) the shippers and forwarders have also an interest in choosing low cost modes and they

do not favour any transport mode in this respect. They simply need to ship their goods in a suitable, reliable and cost-effective way, but only when shippers' core needs have been secured (in terms of cost but also reliability, responsiveness, etc.).

The long term evolution of production networks leads to new demands on distribution structures which can be characterized by an increased pressure on reliability, customization and flexibility. Nowadays we see rapidly increasing vertical disintegration within product columns, and as a result a much more specific set of agreements between the shipper and its logistic service providers. As these chains are becoming more complex, more intricate distribution structures are needed to tailor final products in all their facets to the customer's preferences.

The improved interconnectivity of companies through advanced logistics information systems has opened up the way for the introduction of collaborative planning and execution of logistics operations. Connectivity and transparency are enabling factors for improved planning and scheduling of operations and for real-time adjustments to changed circumstances. Internet technology is crucial in this: instead of time consuming and cost intensive EDI¹⁰ communications systems the present systems can guarantee a fast and easy access to their web-enabled communication systems.

These developments have also a major impact on the way inter- and multi modal operations can take place. Whereas in the past these operations required lengthy and time consuming interactions between all parties concerned (shippers, carriers, intermediate parties – forwarders, agents, expeditors –, logistic service providers, terminal operators and so on); the new web-based technologies enable a much quicker and more reliable management of all information flows and interaction between these parties. Current practice in multi modal environments was up until recently that parties could only start to act as the (unexpected) events occurred. Now, through timely information exchange and improved planning of these operations, a large part of the unreliability of these systems and unnecessary buffers can be avoided.

This has opened up the possibility for a complete reconfiguration of logistic systems. Whereas in the past many last minute requirements left no openings for slow modes of transport, nowadays the improved planning opportunities lead to possibilities for integrating slow and fast modes of transport into one integrated system that can guarantee that customer requirements are met.

Another option is the introduction of an integrated collaborative planning system where producers, retailers and logistic service providers work closely together through the sharing of information of production, sales and logistics. This can lead to the reduction of safety stocks, the stabilisation of physical flows and the reduction of logistics costs while improving the customer service to the clients. A nice by-product of these integrated multi-modal logistic systems is that they lead to higher levels of sustainability because the slow modes of transport that are used in this relaxed logistics process use less energy than their panicking, ill-informed, improvising competitors from the past.

The idea behind these optimization processes is not very complicated: it asks for a certain level of co-operation of all parties concerned and also of the vision of a central key person (some-times called orchestrator or chain manager) that who can design smart solutions for integrated logistics problems. It seems that there exist many potential possibilities for such logistics improvements and the research proposal is therefore to trace these possibilities and to find some general tools for problem solving.

¹⁰ EDI Electronic Data Interchange

Concluding, the transport costs will increasingly take a larger share (either in monetary cost or in time cost) in logistical costs. This development, combined with the increased cost awareness of customers, will lead to finding the lowest cost solutions in transport (in terms of general cost consisting of time and monetary costs). This means that flexibility and responsiveness in intermodal networks is a requirement for making intermodality a reality

Intermodal loading units.

Another proposal is to standardise equipment used in intermodal transport within the existing international standards to lower market barriers and increase efficiency. Pallets size and height, loading units, chassis and semi-trailers offer considerable potential to further facilitate the functioning of a true intermodal transport network. The Commission, after having made a proposal for the standardisation of intermodal loading units 2003, could consider further legislative proposals for other equipment to foster efficiency and effectiveness. However, the proposal for standardisation of intermodal load units has led to objections from (some of the) short sea shipping forwarders, who use non-standard 45ft containers (that allow a more efficient storage of Europallets).

II.7. Action priority 2: Eliminating bottlenecks

II.7.1. Policy 6: Building the Trans-European transport network

The report of the Van Miert high level group has provided an important new impetus to the TEN-T. The Parliament and the Council have approved the revised TEN-T guidelines and financing rules in 2004. The result is a 600 billion euro investment programme stretching from now up to 2020, with a concentration of EU financing particularly on cross-border projects and with a significant increase in Community financing.

The TEN network is one of the policies in the White Paper that has the largest degree of advancement at the European level. All measures mentioned in the White Paper have been realised by means of Regulations, Directives or Decisions. Since the publication of the White Paper, there has been an enormous amount of Commission initiative: a Decision on renewed TEN Guidelines, a Regulation on new rules for the granting of financial aid, a proposal for the establishment of a TEN Executive Agency, the appointment of 6 European Coordinators, a proposal for a new Regulation on the granting of financial aid (including substantial increases in the budget), a proposal for a loan guarantee instrument, the Directive allowing for the use of “competitive dialogue” in public procurement, the establishment of a new high level group, etc.

Implementation at the local level, however, is proceeding at a slower than planned rate. The ambitious programme of the Commission of creating a connected transport network has met the favour of all the Member States, which regard it as a way to improve the national transport systems too. The 10 new Member States consider the TEN projects are very important as they give them the opportunity to modernise the post-socialist transport infrastructure. In all post-socialist countries, both governments and transport users notice that infrastructure is crucial for the new Member States’ transport policy¹¹.

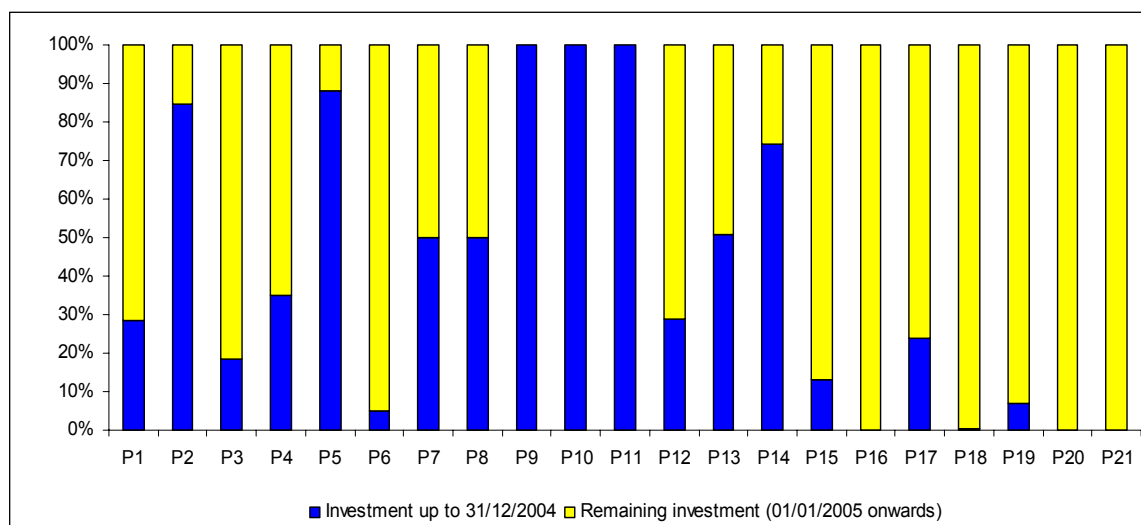
Such projects, however, require a considerable amount of financial resources. The EU contribution has proved to be an insufficient aid to the Member States. The new rules for granting Community aid pro-

¹¹ See also opinions of Ministries of Transport representatives, reported during the meeting in the Commission on 13th of July 2005 concerning White Paper revision

posed in 2004 are still waiting for approval. In fact, scarcity of funds is at the basis of some delay in implementing this policy, together with a slow planning activity and difficulties in reaching a consensus. The Member States, which are also obliged to respect the Stability and Growth Pact, have met difficulties in raising the financial resources, and the absence of private capital available has further slowed down the projects' progress. Now, only three TEN-T projects have been completed: the Railway axis Cork-Dublin-Belfast-Stranraer, the Malpensa Airport (Milan), the Öresund fixed link.

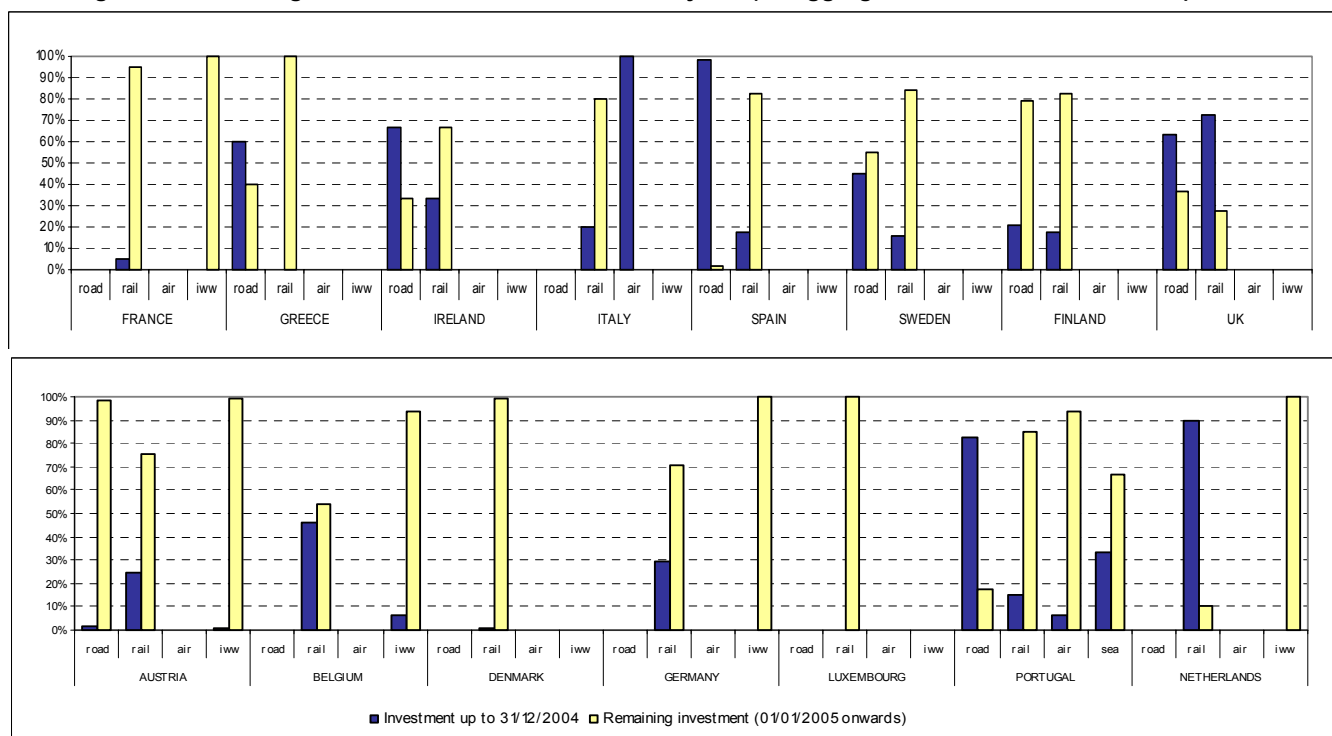
Figure 2 shows the remaining investments for the EU15 TEN projects (P1 .. P21), while Figure 3 shows the same data disaggregated by country and mode of transport.

Figure 2: Remaining investments in the EU15 TEN Projects



Source: DG TREN, The numbers P1-P21 denote the numbers of the priority projects.

Figure 3: Remaining Investments in the EU15 TEN Projects (disaggregate for counties and modes)



Source: DG TREN

Some 40% of the cost of the 14 Essen initial priority projects has already been invested and about a quarter of the current 30 priority projects. While a sizable part of total work corresponding to the initial list has been carried out, delays persist, and the strongest financial needs are precisely in the period 2007-2013. For some important projects, investment is very advanced. The Paris-Brussels-Köln-Amsterdam-London project has some 85% of its investments² made. By 2007 most of the project will be completed. Madrid is already linked to Lerida and Huesca by HST, and by 2009 the line will reach Perpignan. Most of the investment has also been carried out for the Betuwe line which will open in 2006. More than half of the motorway axes “Via Egnatia” and “Via Pathe” have been completed and they will be completely finished by 2010. This adds to the 3 priority projects already finished.

An analysis of the TEN network¹² with the CGE model (see Annex VII) shows that the overall effect of the TEN for EU25 is +0.16% of GDP, for the 15 old Member States we calculate an impact of +0.16% and for the 10 new Member States an effect of +0.25%. One can see that some of the projects, especially in the periphery and the new Member States, have a considerably higher impact than those in the centre of Europe. The impact is probably underestimated, as the model did not take into account the effect on congestion, only on modal choice.

The overall picture shows that there are considerably high impacts on GDP in Spain and Portugal, in southern Italy, in Greece, Ireland and Southern Scandinavia that stem from the implementation of the Essen list of projects. The new list of priority projects has added projects in the new Member States that especially aim at connecting the centres and capital regions in those countries. These projects also show positive effects in the regions directly connected to these new roads and rail lines, especially in Poland, Slovakia, Hungary and Bulgaria.

An alternative scenario¹³ – a longer list of TEN and TINA projects – shows that the overall effect of the policy package is +0.32% on GDP in the enlarged EU and an impact of +0.68% on GDP in the new Member States. With respect to the distribution of GDP/capita it tends to favour the regions with a lower GDP/capita in the reference situation rather than the richer regions. Hence, the policy package contributes to the achievement of the territorial cohesion goal.

Previous model runs in the TEN-STAC study¹⁴ show that TENs priority projects would only have an impact on the particular transport corridors, and only a very modest impact at the European level. The changes of demand on these corridors are significant on the local level, but likely to be small when compared with the national totals: about 2% of the road freight would shift to other modes under an optimistic growth forecast.

Whilst some progress has been made towards revising the Eurovignette Directive and creating a new source of funds for TEN-T projects, the lack of success with the implementation of infrastructure charging has meant that a potentially key source of finance for the TEN-T has not become available.

¹² In the first scenario we analysed the effect of the addition to the European transport network of the complete list of TEN priority projects (see European Union, 2004) excluding the high-speed rail interoperability project on the Iberian Peninsula, Malpensa Airport, the Danube river improvement between Vilshofen and Straubing and the global navigation and positioning satellite system Galileo. The reason for this exclusion of projects, is that the CGE runs rely on the IASON project runs, where this decision was taken, see Deliverable 6 of IASON.

¹³ The second scenario analysed is the policy scenario consisting of all TEN and TINA projects in the EU-25 plus Bulgaria and Romania which are completed until the year 2021. For a full list of the projects included, we refer the reader to IASON D6 (see Bröcker et al., 2004).

¹⁴ TEN-STAC deliverable D8, page 17.

The recently approved new procedure for award of public contracts, the so-called “competitive dialogue”, could provide a useful framework for concessions, and thus for private-sector financing. In the last two years, the Commission has taken numerous innovative initiatives that should contribute to solving the financing problem (the new loan guarantee instrument, letting Marco Polo II contribute to the financing of the Motorways of the Sea, the proposed creation of an Executive Agency, the creation of a steering group within the Commission, the appointment of European coordinators).

Further efforts to progress the Commission's proposals are recommended, but in the face of continued financing constraints, attention should also be maintained on further enhancing the appraisal and prioritisation of TEN-T projects. A report on the connections between the TEN-T priority axes and neighbouring countries, written by the new high level group chaired by former European Commission Vice-President Loyola de Palacio, is forthcoming.

II.8. Action priority 3: Placing users at the heart of transport policy

II.8.1. Policy 7: Improving road safety

The table below shows observed and expected number of traffic fatalities in EU15 and NMS10. The observed numbers are according to IRTAD and CARE databases. The expected numbers are according to the partial scenario, as assessed in Annex XI. It can be seen that the number of fatalities is decreasing. However, continued effort is required to fulfil the White Paper target of halving the number of persons killed by 2010.

Table 8: Number of persons killed

	observed				partial scenario		
	2000	2001	2002	2003 (*)	2005	2010	2020
EU15	41 121	39 852	38 604	36 638	33 989	26 660	18 118
NMS10	11 481	10 535	11 131	10 782	9 934	9 101	7 399

(*) Estimate

Fatality rates of road traffic have decreased significantly following the introduction and enforcement of more stringent speed limits and vehicle and infrastructure safety standards. But in the new Member States the growth in traffic is increasingly offsetting these improvements; the number of fatalities in the period 2000-2003 was stabilising. It is expected that these countries will follow the rest of Europe in a decrease towards 2010.

Further improving traffic safety is a shared responsibility of the Commission and the Member States. The reach of the White Paper (as an independently assessable set of measures) is therefore limited, and so is the assessability of the White Paper measures of the actual reduction of fatalities. This is due to the fact that the effect of some measures depends upon what is being undertaken in the Member States, and the effect of others to future steps not being known now. Still, the aim of this project is to quantitatively assess the effects of the White Paper, and specifically of the safety measures therein. In assessing the effects of the White Paper safety measures, we encountered quite some difficulties. Not because the White Paper measures aren't good, but because the measures were mostly not expressed sufficiently specific to enable assessment of the expected effects. Traffic safety may well benefit from the White Paper measures, but to quantitatively assess them, many measures are not specified sufficiently.

Not all White Paper measures were stated in a way that made it clear and easy to decide what effects are to be expected from the measure. For other measures, the effects are clearly positive, although small in a quantitative sense. As the project aims at an assessment on a European level, very small effects are not considered in our quantitative analysis, and we sometimes assumed specific activity in the Member States, as a result of the White Paper.

The measures stated in the White Paper roughly fall into two action levels: harmonization of penalties and promotion of new technologies to improve road safety. These are indeed important issues. Controls and penalties vary across states, and for drivers to comply with traffic laws, it would be best to have a European traffic system that is consistent, predictable and uniform. Also, technological improvements have a great potential to improve safety.

These "action levels" that are stated in the White Paper, (the harmonization level and the technological improvement level) could be extended with more levels of action, or more categories of measures. The focus is now on measures with a legislative or technological character, but one could also think of measures organised around infrastructure or behaviour.

Then for the specific measures, the following conclusions can be made. Some of the measures are indeed important and should be carried out, but they are in themselves not significantly reducing the number of traffic fatalities. We illustrate this with two examples.

Measure 47 proposes to set a target of halving the number of traffic fatalities in 2010 as compared to 2001. Target setting is extremely important, because it gives a motivation to the national authorities to invest effort to reach the target. However, for target setting to be effective itself, other measures are to be taken by the Member States. Assessment of the effect depends on these local measures. To calculate the effect of Measure 47 one should know the different measures that have been taken and the vision that has been developed by the Member States. Also, if a Member State decides for a less ambitious target, the EU target becomes virtually ineffective for that country. A quantitative assessment of the effect of the EU-target itself is therefore not possible. Measure 52 proposes independent technical investigations. Again, this is a promising measure, but it is impossible to make an accurate assessment about the effects of having a supra national independent road safety research council on the relative fatality rate of road users. Such a council would no doubt generate new and valuable knowledge, and we advise in favour of such a measure. The effects on the number of fatalities would however only be through new measures, being thought of due to this new knowledge.

Some of the measures are possibly not very effective, when we only look at the number of fatalities, because either the traffic safety problem they are directed at is not substantial (seat belts in coaches) or prior research shows that safety effects are marginal (driver improvement courses). However, it should not be understood that these measures are to be avoided. It is very well possible that measures with modest effects are still cost effective. If cost-effective measures are to be selected, the absolute number of fatalities saved is not the only criterion. In the sense that the effect of measures is to be quantitatively assessed, the measures are sometimes not appropriately described (which is a consequence of the nature of EU measures).

Other measures are potentially effective, but could be extended, for example the measure on black spots. Measures directed at black spots would have the potential to increase road safety. However, in the measure the focus is on signposting. This may have a small effect, which can be improved upon with other (e.g. infrastructural) measures to handle black spots. Signposting itself is not very effective, but can be worthwhile when the measure is easily carried out. Once it is known where these black spots are (which is

perhaps quite an investment for some countries), taking additional measures to tackle the problems connected to these black spots, may be an important and effective next step.

Finally, the White Paper lists measures on several important subjects, such as enforcement and e-safety. The effects of e.g. speed limit enforcement and Intelligent Speed Adaptation are beyond doubt. However, the measures as stated do not lead directly to implementation of enforcement or e-safety. So although the subjects of these measures are very important to traffic safety, the measures need further specification to enable estimation of the expected effect. In the assessment of this report, however, we have optimistically assumed that both measures are indeed followed by the intended implementation steps.

The general conclusion is that the measures do indeed offer good possibilities to improve road safety. In order to be more effective, it would be good to determine measures on those selected levels that are known to be problematic for road safety, and to design measures that tackle more of the actual problem at hand. Finally, for a quantitative assessment of safety measures, a distinction should be made between measures that facilitate road safety research and policy, (like target setting and installing traffic safety boards) and measures that are actually directed at reducing road traffic fatalities. The first type is not well assessable.

II.8.2. Policy 8: Effective charging for transport

The progress is slow in implementing the Community policy on effective transport charging. One proposal has been rejected: Proposal COM (2002) 410 on Uniform commercial road transport fuel taxation. Proposal COM (2003) 448 on infrastructure charging is still under discussion. The measure on harmonising VAT deductions is also not realised. The other measures however, as Electronic road toll system, a better taxation of passenger cars according to environmental criteria, taxation of energy products and exemptions for hydrogen and biofuels and the introduction of a minimum share of biofuels consumption in road transport are making progress or are even realised.

Only just in 2005, a directive on road pricing is being discussed by the European Institutions having reached a political agreement at Council level before going to the Parliament for a second reading but this directive has a limited scope.

Consequently, the implementation activities in the various Member States is also low. According to our policy review, adopting policy on effective charging for transport is the less implemented policy among the EU15. Concerning road transport, which is the most interested by this policy, the fuel taxes widely differ between countries, while out of the 15 Member States only 6 states (Austria, France, Greece, Italy, Portugal, Spain) raise distance-depending HGV-charge and only 5 (without Austria) charge for passenger car use on the motorways (excluding vignettes).

The main bones of contention concern the use of revenues generated by road tolls and the different interest at stake between peripheral and central countries. In particular, there isn't agreement concerning the revenues use, with some Member States arguing that the charging of road use is being put in place to generate additional state revenues and not to ameliorate the existing infrastructure, nor to help reducing congestion and negative environmental impacts. At present, the UK is considering the introduction of a distance-based road charging scheme for heavy lorries from 2006. The government's Commission for Integrated Transport advocates tolls for all roads in 10 years time. Germany introduced a distance-based road pricing model for heavy goods vehicles in January 2005. In the new Member States, still the problem of insufficiency of public resources determines the existing system of transport charges. The existing system has almost nothing to do with plans of reforming transport charging policy on the EU level.

The White Paper's charging policy offers the possibility of managing transport demand and, hence, limiting the negative impacts of transport, at the same time as generating a source of revenue which can be used to finance key transport infrastructure investments. This link between charging, demand management and infrastructure investment, whilst at first appearing to be a wholly virtuous connection, seems also to have proved to be a major source for disagreement amongst the key stakeholders. This lack of agreement on this and on other elements of the policy has translated into an overall lack of progress in implementing the White Paper's charging policy proposals which, if continued, mean that the White Paper's objectives in relation to modal split and infrastructure investment will almost certainly not be achieved.

The key proposal in this area was to bring forward a framework directive setting out the principles and structure of an infrastructure- charging system and a common methodology for setting charging levels, offset by the reduction or removal of existing taxes. This framework was also to have allowed cross financing, by establishing a Community framework for allocating revenue from charges on competing routes to the construction of new infrastructure, especially rail infrastructure. It was anticipated that the draft Framework directive and methodology paper would be published in 2002, followed by a series of four separate Directive proposals dealing in detail with the practical implementation of pricing for road, sea, rail and air modes. However, the drafts have not emerged to date, though a Communication on the subject is currently being prepared for publication in 2006.

In the absence of a common charging framework applicable to all modes being developed, focus on infrastructure charging has turned to roads, at the same time as an attempt to establish the framework for allocating revenue from charges on competing routes to the construction of new infrastructure, referred to above. In July 2003 the Commission published its proposal COM (2003) 448, in the form of a draft directive revising the so-called Eurovignette directive; Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructure.

The proposal to revise the Eurovignette involves the broadening of the scope of charges so that they apply to a wider range of HGVs and a wider range of road types, allows charges to vary according to an increased number of factors (to reflect environmental and congestion costs), increases in tolls in certain environmentally sensitive areas and earmarking of revenues from these mark ups for investment in alternative transport infrastructure. However the average level of charges is still linked to infrastructure costs rather than external costs, limiting the extent to which social marginal cost can be reflected. The proposal is now subject to the second reading of Parliament and assuming Parliament and Council can agree, it should become law by the end of 2005.

The revision of the Eurovignette directive represents an interesting but troublesome story, and demonstrates the difficulties in gaining acceptability for what was a key plank in the White Paper – the internalization of externalities and the use of the revenues so produced to fund new investment in road and rail infrastructure. Opponents of the White Paper's infrastructure charging policy have successfully limited the extent to which the proposed charges would reflect marginal social cost, and opponents of the White Paper's infrastructure investment policy have successfully broken the direct link between infrastructure charges and infrastructure investment.

It should be noted also that the above discussion relates entirely to heavy goods vehicles. Charging for the use of roads by the private car is seen as a matter for the individual Member States.

In the case of rail, a Directive (2001/14) does exist which requires charges to be based on marginal social cost, although allowing reductions in the light of undercharging on other modes and mark-ups where needed for financial reasons. As is allowed for in the directive, there is great diversity in the structure and level of charges in different countries; a particular problem is the very high charges in some of the new Member States.

In the case of air transport, proposals to charge airlines for the environmental and other external costs they cause have been hotly resisted by industry, and there is essentially no progress to date, although an initiative on climate change is anticipated. This is also the case for water transport.

In chapter III.3 the modelling outcomes of social marginal costs pricing is described. It is understood that a major part of this impact is due to pricing policy. In other words, marginal social cost pricing is absolutely crucial to the Commission's policy on preventing further shifts in mode split towards environmentally damaging modes, although a lot of its effect is to reduce the volumes on the modes with high external costs without a transfer of traffic to other modes. Most literature shows indeed that an increase in prices leads towards a reduction of transport volumes rather than a modal shift. The choice of modes is not so much subject to the out-of-pocket price as to other effects as the quality of service.

In summary then:

- The problem with EC charging policy is largely one of a failure to achieve agreement on proposing the policy envisaged (charging framework directive) and to implement it. The policy recommendation is therefore to push harder for a full proposal, and related adoption and implementation.
- This certainly requires proposals for full implementation of marginal social cost pricing on all modes of transport to be brought forward urgently (framework directive), together with guidance on how to calculate marginal social cost and implement the policy
- The social marginal cost pricing is not only beneficial for congestion relief, but also to reduce the external costs of pollution and accidents.
- The difficulties of achieving agreement on measures to implement this policy are well understood. Innovative approaches will need to be taken concerning the use of revenue from the charges as well as the use of the EC's own budget to reassure stakeholders that the policy will not damage the competitiveness of European industry and of the peripheral states.

II.8.3. Policy 9: Recognizing the rights and obligations of users

In its White Paper on European transport policy for 2010, the European Commission committed itself to placing users at the heart of transport policy. The opening of borders and the creation of the single market saw very strong growth in mobility and important evolutions in various modes of transport – the creation of low-cost airlines, computerization of the reservation systems, construction of the high speed lines, etc.

More than half of the measures included under these policies did not result in approved legislation at the European level. Taking into consideration the current legislative developments in the area of the rights of air and rail passengers and public service in transport and on-going formulation of rights of passengers in coach and maritime transport it can be assumed that the policy as defined in the White Paper will be fully implemented in the year 2010.

This policy is – as most policies – lagging behind in some countries. The policy “recognizing the rights and obligations of users” has not been perceived as a high priority in the new Member States. Only public service obligation has been regulated and some new legal solutions have appeared in recent years.

II.8.4. Policy 10: Developing high-quality urban transport

Environmental and health considerations and the effort of coping with urban road congestion are at the basis of the policy on developing high quality urban transport.

At the European level, the measures in the policy on developing high quality urban transport are relatively far advanced, partly because the 3 proposed measures are more modest. They predominantly aim at promotion and support activities, which are well embedded in several research and support programs of the Commission:

- Support for pioneering towns and cities (CIVITAS initiative)
- Promote the use of clean vehicles in urban public transport
- Promotion of good urban transport practices

The implementation degree at the Member States level is various. Finland and Sweden, historically active in environmental issues, and France are quite active in implementing this policy but a scarce level of implementation is recorded in other EU15 states (Italy, Belgium, Luxemburg, Spain). In the new Member States, the level of implementation is on track in most of the countries. Due to the growing congestion problems in the cities and high growth of private motorisation, also the new Member States have aimed at improving public transport.

Given the constraints of the principle of subsidiarity, the Commission intends essentially to encourage the exchange of good practice in the area of modernization of public services, better use of public transport and rational use of the car. Problem of worsened living environment in urban areas in most countries forces public authorities to undertake actions aiming at improving public transport competitiveness. However, the deterioration of the financial situation in some cities, especially in the new Member States, has made an acceleration of the financing and provision of urban infrastructures and provision of public transport from public budgets increasingly difficult.

II.8.5. Policy 11: Putting research and technology at the service of clean, efficient transport

The measure in the policy on putting research and technology¹⁵ at the service of clean, efficient transport has already been implemented in 2005 and this is expected to be continued up to 2010.

Under the 5th and 6th Framework Programmes many studies and projects have been funded by the EC. The proposal for the 7th Framework Programme is in Parliament.

In general, the EU research policy serves the realisation of the White Paper objectives¹⁶. The private sector spends very important amounts in the field of transport R&D, and that, in general, these amounts are being spent in areas that serve the objectives of the White Paper. Unfortunately, in this stage, the SRA of the Waterborne Technology Platform has not been made public yet, and very little can be said on this particular point.

¹⁵ Policy 11 focuses on research. Issues as clean vehicles and biofuels can be found under policy 8 on charging.

¹⁶ See Annex II for an elaborate analysis. Some of these projects have been addressed in this report as separate measures like Galileo, ERTMS, CUTE, eEurope. As regards Intelligent Traffic Systems, the EC has funded between 2001 and 2006 several studies, like AIDE, EASIS, PREVENT, GST, APROSYS.

II.9. Action priority 4: Managing the effects of globalisation

II.9.1. Policy 12: Managing the effects of globalization

Measures grouped in Policy 12 “Managing the globalisation”, such as EU transport external relations and developing Galileo programmes, have been implemented to a large extent at the Commission level. The development of the administrative capacity in the candidate countries is realised by means of Phare programme and Transition Facility. Measures concerning IMO, ICAO, COTIF¹⁷, the Danube Commission, and the Rhine Navigation Commission are in progress. Membership of Eurocontrol has been realised, as well as the Galileo programme.

But the measures are still too far to reflect an impact on Member States transport policy. Then, they are not analyzed from the point of view of implementation in EU25. However, big expectations come from the industrial sector of MS as shown by the numerous bidders for Galileo.

And with further enlargement on the horizon, and the transport policy and trans-European network soon to extend across the continent, Europe needs to rethink its international role if it is to succeed in developing a sustainable transport system and tackling the problems of congestion and pollution. Specific objectives and measures, which have been proposed in the White Paper have been realized or their realization is in progress.

But the situation changes very quickly. And this external development has to be taken into consideration now, especially: the continuing globalisation process, changing international relationships, disappointing employment growth, a changing workforce and ICT development.

The enlargement of 2004 (and also the future enlargement processes) means a new geopolitical situation in Europe. The EU has to strengthen its international single voice, also in the context of the big neighbouring area of the Commonwealth of Independent States. New enlargements (Bulgaria, Romania, Croatia, Turkey, ...) will re-enforce this need.

It seems that more pressure should be given to the improvement of transport infrastructure, not only in the centre of the continent and transit routes, but also on peripheral connections and regional networks. It is also the need of technological updating and investments in the areas, where individual activities of the new Member States can not produce the desired effects due to the lack of financial resources or organizational skills.

The development of Galileo, further and stronger support for the development of intermodal transport are the examples of these EU activities. Negotiations on Galileo with other countries, such as India and China, have highlighted the international interest in the Galileo project.

¹⁷ IMO: International Maritime Organisation, ICAO: International Civil Aviation Organization, COTIF: Convention concerning International Carriage by Rail.

III Assessment of the objectives

III.1. Approach

The effects of the measures in the White Paper on the objectives have been assessed with a modelling and indicator approach.

First, the objectives in the White Paper have been quantified into indicators. For most the White Paper has at least defined the preference direction, for a few there are quantitative targets given. Many White Paper objectives concern however organisational issues which are considered in the study as means to achieve the overall ends. Of these overall ends, only very few are precisely quantified.

Four scenarios have been developed, in increasing level of ambition:

- (i) Null scenario (N-scenario): assumes that none of the White Paper measures has been implemented.
- (ii) Partial implementation scenario (P-scenario): includes only measures that will most likely be implemented before 2010. This scenario is what – under current conditions – will actually happen in the future.
- (iii) Full implementation scenario (F-scenario): includes all White Paper measures.
- (iv) Extended scenario (E-scenario): for most measures the extended scenario follows the full scenario while for some measures the partial scenario is followed because there is no indication that the full implementation is feasible. Additional to this two policy changes have been introduced.

A detailed description can be found in chapter III.2 and Annex V.

These scenarios have been analysed with a set of models, of which the core model was the SCENES transport model. The SCENES output then was processed into TREMOVE (vehicle stock, emissions, fuel consumption, government revenues), CGE (regional welfare), SLAM (logistics), a noise model, the SWOV road safety model and a macro-economic model.

The results of these model runs, and an analysis of these results, can be found in several Annexes, in chapter chapters III.3 and III.4, and in Annex XVII.

It has to be noted that the White Paper itself does not produce evidence that the measures put forward are the most cost effective ways of achieving the policy objectives. A cost-effectiveness analysis is also not the subject of our indicator study. The results should be therefore looked at in the light of this.

III.2. Scenarios

The White Paper was published in 2001 and presented a number of objectives to be achieved in 2010. The mid term evaluation has two objectives. Firstly, it is assessed to what extent the implementation activities in the period 2001-2005 are in conformance with what has been proposed in the White Paper and secondly, it is assessed whether the objectives are still feasible, taking into account the policy and trend developments in the past period.

For this second objective, the developments in the transport sector are estimated on basis of four policy scenarios. The four policy scenarios are:

- (i) Null scenario (N-scenario): assumes that none of the White Paper measures has been implemented, neither at the European level nor in the Member States. The N-scenario is the autonomous trend development and acts as the reference case.
- (ii) Partial implementation scenario (P-scenario): includes only measures that will most likely be implemented before 2010. This means that the measure is already implemented or that there are clear indications that implementation will take place soon. The latter is the case when approved EU-directives include deadlines for Member States to adapt national legislation accordingly. This scenario is derived from the results of the policy review up to 2005 described in Annexes I and II.
- (iii) Full implementation scenario (F-scenario): includes all measures introduced in the White Paper and in the White Paper action program (in the Annex 1 of the White Paper).
- (iv) Extended scenario (E-scenario): for most measures the extended scenario follows the full scenario while for some measures the partial scenario is followed because there is no indication that the full implementation is feasible. An example of the latter case is kerosene tax. Since global implementation seem infeasible a compromise that applies the tax only to intra-European flights is included in the extended scenario. Additional to this two policy changes has been introduced. Firstly, the extended scenario includes more pricing measures, most importantly higher prices for freight haulage and introduction of road pricing for passengers. Secondly, it includes a faster uptake by market parties of the opportunities that are enabled by the new EU legislation on liberalisation by providing the financial incentives and technological means. This means a faster implementation of the RIS, EMRTS and SESAME technological projects in respectively inland waterways, rail and air transport, a faster introduction of Galileo applications and more effort on competitive tendering and market opening in the rail sector to accelerate reform in the passenger sector.

All four scenarios are developed for 2010 (the time-horizon of the White Paper). Sometimes the implementation and the impact of measures takes time. For example, some of the TEN-projects have been started within the period 2000-2010 but they will be finalised in the period 2010-2020. Also pricing for passenger road transport in the extended scenario will only be introduced in from 2011 onwards. To show the impacts of these measures the scenarios are developed and evaluated for both the year 2010 and 2020.

The impact of each measure on relevant transport sector variables are quantified by using various literature sources, among others the results of several European projects. Estimations have been made with regard to the size of the impact when a measure is not fully implemented yet. In Table 9 the estimated impacts of the four policy scenarios on travel costs respectively travel times are presented. These values are used to compute with, amongst others the SCENES and TREMOVE model, the impacts on the transport sector (modal shares etc.) as well as various economic, social and environmental impacts of the policy scenarios. A detailed report on the measures in each scenario and the quantification can be found in Annex V.

Table 9: Effects of scenarios on main variables (indicative average values)

Variable		Null (do nothing)	Partial (most likely)		Full		Extended	
		2010-2020	2010	2020	2010	2020	2010	2020
Road Freight cost	Min	0%	11%	13%	0%	7%	7%	13%
	Max	0%	19%	23%	30%	41%	41%	61%
	Average	0%	15%	17%	14%	21%	21%	33%
Road Freight time		0%	-1%	-1%	-2%	-3%	-1%	-2%
Rail Freight cost	Min	0%	-1%	-4%	-15%	-18%	-17%	-21%
	Max	0%	-1%	-3%	4%	3%	4%	2%
	Average	0%	-1%	-3.5%	-6%	-8%	-7%	-10%
Rail Freight time		0%	-7%	-13%	-10%	-18%	-14%	-24%
Rail border time		0%	-8%	-15%	-8%	-15%	-8%	-15%
Ship cost (excludes port handling)	Min	0%	2%	2%	2%	4%	4%	7%
	Max	0%	7%	14%	14%	32%	32%	64%
	Average	0%	4%	8%	8%	16%	16%	32%
IWW cost	Min	0%	1%	1%	-9%	-8%	-10%	-10%
	Max	0%	2%	2%	11%	13%	11%	14%
	Average	0%	1.5%	1.5%	0.5%	2.0%	0%	2.4%
IWW time		0%	-1%	-2%	-2%	-3%	-3%	-5%
Freight Terminal cost		0%	-4%	-8%	-9%	-15%	-10%	-16%
Freight Terminal time		0%	-13%	-22%	-19%	-29%	-20%	-31%
Road load factor		0%	2%	2%	4%	4%	4%	4%
Car cost	Min	0%	0%	0%	0%	0%	0%	18%
	Max	0%	0%	0%	0%	0%	0%	50%
	Average	0%	0%	0%	0%	0%	0%	37%
Car Time		0%	0%	0%	-2%	-2%	-3%	-3%
Bus cost	Min	0%	0%	0%	0%	0%	0%	0%
	Max	0%	0%	0%	0%	0%	0%	0%
	Average	0%	0%	0%	0%	0%	0%	0%
Rail pass cost	Min	0%	-1%	-1%	-1%	-2%	-1%	-2%
	Max	0%	-1%	-1%	-1%	-2%	-1%	-2%
	Average	0%	-1%	-1%	-1%	-2%	-1%	-2%
Rail pass time		0%	-1%	-2%	-2%	-3%	-2%	-3%
Air cost	Min	0%	0%	0%	1%	-2%	0%	4%
	Max	0%	0%	0%	1%	-2%	0%	14%
	Average	0%	0%	0%	1%	-2%	0%	8%
Air time		0%	-4%	-5%	-5%	-8%	-7%	-11%
Pass. Terminal / Border time		0%	0%	0%	-2%	-2%	-5%	-5%

"Average" values quoted are an estimate of the EU weighted average using costs and volumes from the 2020 Null scenario and represent the change in cost of a journey having average unit cost per tonne-km/passenger-km in the null scenario.

III.3. Transport modelling results

III.3.1. Summary of model results by scenario

The SCENES model is a European-wide multi-modal integrated passenger and freight transport model. SCENES uses standard European nomenclature and NUTS 2003 GIS data to define the geographic areas. For the purpose of this project, all new Member States are incorporated within the model as internal zones. The base year of SCENES has been updated from 1995 to 2000. This means that all main input data underpinning the base year modelling have been up-dated accordingly, including the national accounts and the associated input-output tables (for EU15), population size and profiles, and transport networks and road vehicle operating costs. The model provides transport demand forecasts for both 2010 and 2020, based on a set of macro-economic and trade assumptions derived from DG TREN's GDP forecasts, and road vehicle operating costs derived from recent fuel price assumptions for 2010 and 2020 (see Annex V and VI for further discussions).

The freight demand model for the EU15 countries is based on a sophisticated regional economic model using spatial input-output techniques, whereas for the EU10 the freight demand matrices are estimated using DG TREN's TEN-STAC study (TEN-STAC, 2004) and Eurostat's COMEXT trade matrices.

The passenger demand model uses a uniform trip generation and distribution mechanism for all EU25, within which the travel demand is estimated according to the age, employment and car ownership profiles of the population of each model zone; it covers all short and long passenger trips, including walking and cycling.

The SCENES forecasts have been made at the broad geographic and demand segment levels as defined by the zoning and transport demand segmentation adopted in the model (See Annex VI). As a result, they should be considered as forecasts at the strategic level, rather than embodying detailed transport operations at the local level.

Compared with earlier demand forecasts (such as TEN-STAC), the ASSESS project has made use of more recent GDP projections (which are lower than previous ones), and its demand forecasting has benefited from a longer time series of freight demand observations up to 2003/04. As with any model results, the transport demand growths forecast by SCENES are subject to a degree of uncertainty. This uncertainty has been analysed for the key scenario using sensitivity tests.

III.3.2. Scenarios

For 2010 and 2020, four scenarios have been run as specified by the project. They are the Null, Partial, Full and Extended. In particular, the Partial scenario has been tested through two alternative sets of model assumptions on pricing and freight logistic trends in order to examine the possible variations in demand growth. These are denoted Partial A and Partial B.

The model test results are summarised below for each scenario. Where appropriate, we also highlight any weaknesses and uncertainties in the results. For details of model development and scenario test results, see Annex VI.

III.3.2.1. The Null scenario

The Null scenario represents a contra-factual situation in which of no White Paper policy measures had been applied. In the absence of the White Paper policy measures, the transport situation is assumed to follow the recently observed trend since the late 1990s. Road congestion would worsen around a number of metropolitan areas. Road building would continue, e.g. in EU10. Road freight haulage costs may fall in some areas because of labour costs, whilst rail freight services would be constrained by supply limitations. There would be continuing changes in freight logistics and land use, which would in many cases favour road freight.

In order to represent these changes, the model parameters have been adjusted so that the modelled growth trajectories for 2010 and 2020 reflect the observed trend between the late 1990s and 2003/2004, which represents the period prior to the application of the White Paper measures. These model adjustments are then applied equally to all four scenario tests so that they are compared on a consistent basis. Given that there would be compensating changes in the costs and travel times over time under the Null scenario, it is assumed for simplicity that the input transport cost functions and average speeds on network links are the same as for the 2000 model run.

a. Freight transport demand

The table below presents for the Null scenario the SCENES results for percentage change in freight transport demand among inland transport modes for the time periods between 2000 and 2010, and 2000 and 2020..

Table 10: Null scenario – Freight transport demand, billion tonne-km per year

Region	Mode	observed 2000	Null scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Road	1 319	1 553	1 873	18%	42%
	Rail	250	240	240	-4%	-4%
	Inland waterway	127	138	155	9%	22%
	All	1 696	1 931	2 268	14%	34%
NMS10	Road	175	291	405	66%	131%
	Rail	124	117	111	-6%	-11%
	Inland waterway	4	4	4	-3%	3%
	All	304	412	520	36%	71%
EU25	Road	1 495	1 844	2 278	23%	52%
	Rail	374	357	351	-5%	-6%
	Inland waterway	131	142	159	8%	21%
	All	2 000	2 343	2 788	17%	39%

SCENES suggests that, among the inland transport modes, road freight would grow strongly. In the EU25, the growth rates from 2000 to 2010 and from 2000 to 2020 are respectively 23% and 52%. In EU15, the growths are slower, albeit from a high base: the road freight growth rates are 18% and 42% respectively for 2010 and 2020. In the EU10, road freight is expected to have much stronger growth, of 66% and 131% respectively for 2010 and 2020.

Rail freight declines in general, whilst inland waterway gains a modest growth in some countries mainly for lower value, bulk goods.

Compared with the SCENES forecasts prior to the ASSESS project, the current freight demand forecast for the Null scenario is lower for road and inland waterways, and there is a slightly sharper decline in rail freight t-km. First of all, this reflects a generally lower GDP growth assumptions (the GDP growth in EU15 is about 0.5% lower per year than assumed by the earlier SCENES runs, although there are some variations between countries). Lower GDP growth implies lower rates of growth in the production and consumption of goods, and in the imports of raw materials and the exports of components and finished products. This then would lead to lower freight demand growth. Secondly, we have assumed that the trend of rail decline in a number of countries, which is observed in the recent years, would continue in the Null scenario in the absence of White Paper policy measures. The GDP and tonne-km forecast is shown in Figure 4 and Figure 5.

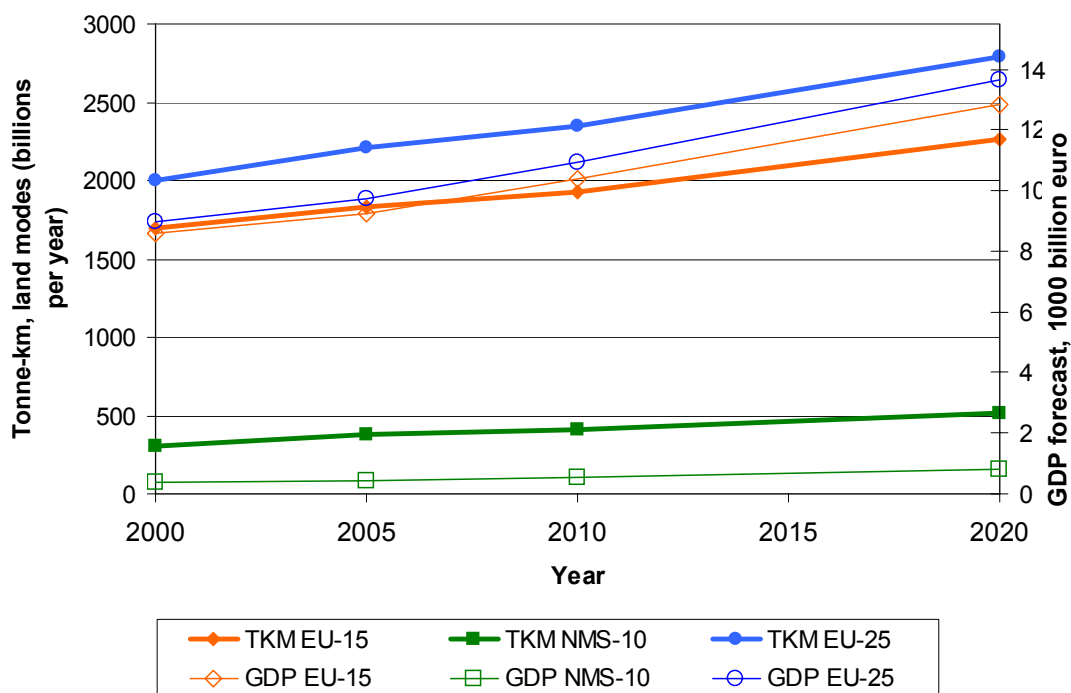


Figure 4: Total tonne-km and GDP in Null scenario trend (road, rail and inland waterway)

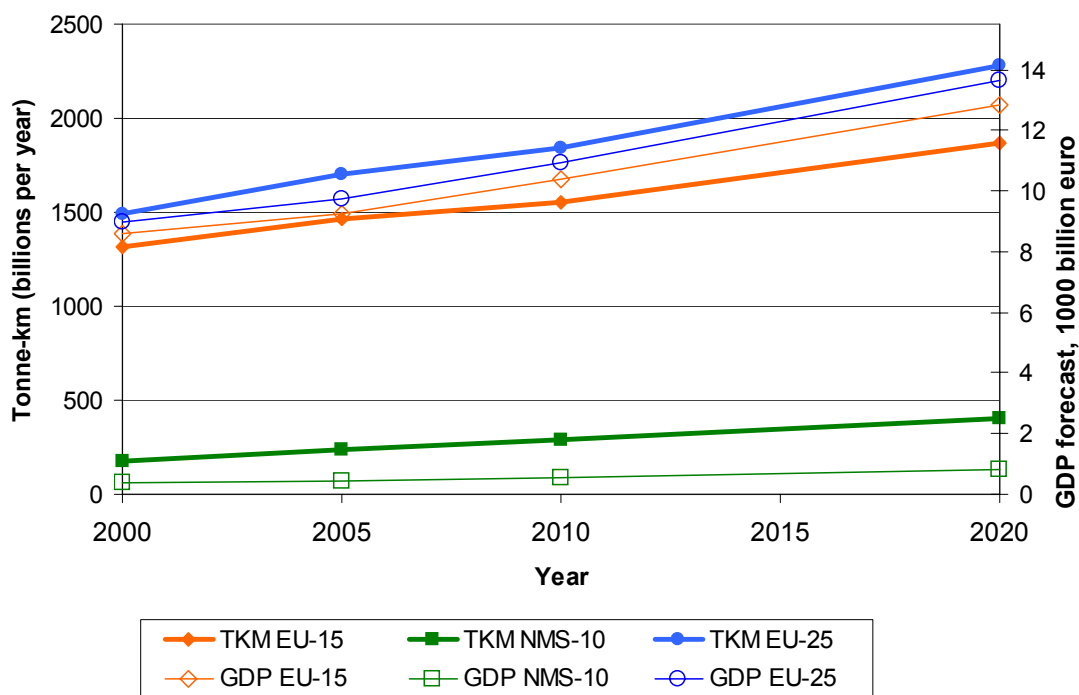


Figure 5: Road freight tonne-km and GDP in Null scenario trend

b. Passenger transport demand

The table below presents the SCENES results for the Null scenario in terms of passenger travel growth from 2000 to 2010 and 2020.

Table 11: Null scenario – Passenger travel demand, billion passenger-km per year

Region	Mode	observed 2000	Null scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Car	4 094	4 706	5 393	15%	32%
	Bus/coach	402	423	413	5%	3%
	Train/metro	351	392	416	12%	19%
	Air	284	428	579	51%	104%
	Walk/cycle	215	244	257	13%	19%
	All	5 345	6 193	7 058	16%	32%
NMS10	Car	325	468	608	44%	87%
	Bus/coach	78	73	67	-7%	-15%
	Train/metro	51	50	48	-4%	-7%
	Air	14	23	34	62%	134%
	Walk/cycle	19	23	24	19%	29%
	All	488	636	781	30%	60%
EU25	Car	4 419	5 175	6 002	17%	36%
	Bus/coach	480	495	480	3%	0%
	Train/metro	403	442	464	10%	15%
	Air	298	451	612	51%	105%
	Walk/cycle	234	266	281	14%	20%
	All	5 833	6 829	7 839	17%	34%

Based on the assumptions of population and car ownership growth, and the characteristics of each passenger demand segment, the SCENES model suggests that, in EU25, the total passenger travel demand (in passenger km) will grow by 17% by 2010 and 34% by 2020. This overall growth is characterised by slower percentage rises in EU15 (by 16% and 32% respectively for the period between 2000 and 2010, and 2000 and 2020) and much faster increases in the EU10 new Member States (30% and 60% respectively). Over this period, the population is stable in EU15 and slightly declining in some EU10 countries, so the growth of passenger demand stems mainly from the increasing mobility of the individuals. Within each geographic area, the growth rates are also quite distinct between different demand segments, with long distance holiday and business travel growing more strongly than shorter distance travel like commuting, education and personal business. This has significant implications for growths on different modes.

Under the Null scenario, the modes that see significant demand growths would be car (17% and 36% respectively for 2010 and 2020, in EU25) and air (51% and 105% respectively for 2010 and 2020, in EU25). Train, bus and walking/cycling are expected to grow more slowly in terms of passenger-km. Passenger train/metro/tram services may still rise in some countries, especially in those where commuting and other journeys have been getting longer but road congestion has constrained the growth of peak time road travel. In EU10, bus and train demand is likely to decline.

III.3.2.2. The Partial scenario

Two variants of the partial scenario were tested: Partial A implements a small fraction of SMCP tolling for all freight modes, while Partial B charges road freight for motorway use only based on a projection of current national motorway tolls and the Eurovignette. Besides differences in road charging, the A and B scenarios are also based on different assumptions regarding freight growth trends. Scenario details can be found in Annex V and VI. In these scenarios, a number of improvements are made to rail, shipping and inter-modal services, albeit at a modest scale, in terms of transit time changes and service quality improvements.

There is little change in passenger travel costs and times under either scenario, and the passenger results from scenarios A and B are effectively identical.

Under the Partial A Scenario, road freight costs rise by 18% on average in 2010 relative to those in 2000, and by 20% in 2020. Partial B has assumed largely the continuing development of the current truck tolls and on average the level of road freight costs is lower.

a. Freight demand

This section will discuss the Partial scenarios. The comparison of two scenarios should only be made bearing in mind the differences in their input assumptions.

Compared with the Null scenario, the policies implemented under the Partial A scenario lead to a lower rate of growth in road freight demand. Compared with 2000, the road freight growth rates are respectively 21% and 43% for 2010 and 2020 in EU25. Compared with the Null, this is 2% lower by 2010 and 6% lower by 2020. Given that the road costs are 18% higher than in Null in 2010, and 20% higher in 2020, the average demand elasticity with respect to price changes is around 0.1 for 2010 and 0.3 for 2020. These are in line with the expected magnitudes of changes: the measures that lead to the road cost increases (including driving restrictions on heavy goods vehicles on designated roads, driver training and social harmonisation of road transport) are still in the process of being implemented. Thus by 2010 the transport system will have only a very short period to adjust. That is why that demand changes are more modest by 2010 compared with the Null. However, by 2020, the impact of these cost changes are likely to lead to larger impacts.

Table 12: Partial scenarios - Freight transport demand, billion tonne-km per year

Region	Mode	Observed 2000	Partial A scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Road	1 319	1 523	1 753	15%	33%
	Rail	250	254	273	2%	9%
	Inland waterway	127	139	157	9%	24%
	All	1 696	1 916	2 183	13%	29%
NMS10	Road	175	280	387	60%	120%
	Rail	124	130	142	5%	14%
	Inland waterway	4	4	5	-1%	7%
	All	304	415	533	36%	75%
EU25	Road	1 495	1 803	2 139	21%	43%
	Rail	374	384	414	3%	11%
	Inland waterway	131	143	162	9%	23%
	All	2 000	2 331	2 715	17%	36%

Region	Mode	Observed 2000	Partial B scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Road	1 319	1 588	1 907	20%	45%
	Rail	250	269	280	8%	12%
	Inland waterway	127	141	164	11%	29%
	All	1 696	1 998	2 352	18%	39%
NMS10	Road	175	298	411	70%	134%
	Rail	124	134	142	8%	14%
	Inland waterway	4	4	4	0%	6%
	All	304	437	558	44%	83%
EU25	Road	1 495	1 886	2 318	26%	55%
	Rail	374	403	422	8%	13%
	Inland waterway	131	146	169	11%	28%
	All	2 000	2 435	2 909	22%	45%

As a result of road cost increases, and the improvements on rail, shipping and inter-modal transport, rail freight is expected to grow by a modest amount (3% by 2010 and 11% by 2020 in EU25).

Under the Partial B scenario, the overall freight demand growth for inland modes tonne-kilometres is likely to be 22% for the period 2000-2010, and 45% for 2000-2020. The road tonne-km growth is likely to be 26% for 2000-2010, and 55% for 2000-2020. Rail tonne-km growth is to be 8% for 2000-2010, and 13% for 2000-2020. Short sea shipping demand, when measured in tonnes received at the ports, is likely to grow by 16 and 36% respectively for 2010 and 2020.

In other words, the policy measures under the Partial scenarios are likely to halt the decline of rail freight, but they would not be sufficient to achieve the target of retaining the modal split pattern of 1998.

b. Passenger demand

When the Partial scenario is compared with the Null scenario, overall passenger demand does not appear to be significantly different. The improvements in rail services under the Part scenario have led to a modest gain in passenger train demand.

Table 13: Partial scenario – Passenger travel demand, billion passenger-km per year

Region	Mode	observed 2000	Partial scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Car	4 094	4 704	5 388	15%	32%
	Bus/coach	402	422	413	5%	3%
	Train/metro	351	398	429	13%	22%
	Air	284	427	586	50%	106%
	Walk/cycle	215	244	256	13%	19%
	All	5 345	6 195	7 071	16%	32%
NMS10	Car	325	468	607	44%	87%
	Bus/coach	78	73	66	-7%	-15%
	Train/metro	51	50	49	-2%	-4%
	Air	14	23	34	61%	136%
	Walk/cycle	19	23	24	19%	29%
	All	488	637	781	30%	60%
EU25	Car	4 419	5 172	5 995	17%	36%
	Bus/coach	480	495	479	3%	0%
	Train/metro	403	449	479	11%	19%
	Air	298	450	619	51%	108%
	Walk/cycle	234	266	281	14%	20%
	All	5 833	6 832	7 852	17%	35%

III.3.2.3. The Full Scenario

Under the Full scenario, the road freight costs rise further as a result of a limited application of Social Marginal Cost Pricing (SMCP). The average road costs rise by 20% overall (including those measures already included in the Partial scenario) by 2010, and 27% by 2020. The Full scenario includes additional rail freight service improvements in addition to those in the Part scenario, including rail freight transit time and border crossing time reductions, improvements of service reliability, and inter-modal service enhancements.

On passenger modes, there are ranges of measures that improve bus and train services. Average car speeds are increased because of better traffic management that is supported by the Galileo programme. On air, the application of VAT to airfares increases the price of air travel by 7%.

a. Freight demand

Under the Full scenario, the SMCP is applied for trucks in all Member States. This appears to have a significant impact on the modal balance between road on the one hand, and rail and inland waterway on the other. Compared with 2000, road demand rises by 19% under the Full scenario, compared with 21% under Partial in 2010. For 2020, the difference between the Partial and the Full scenarios are even larger for road freight demand: under the Full scenario it is 38% relative to 2000, compared with 43% under Partial, for EU25. Rail freight tonne-kms have a much stronger growth across the EU25, by 8% in 2010 and 19% in 2020, relative to the year 2000.

However, the road and rail percentages indicate that only a limited proportion of the freight tonne-kms are transferred from road to rail under SMCP. The tests by the model suggest that a significant proportion of road freight demand reduction is through a shortening of the average lengths of road haulage. In other words, only a limited range of goods (such as the weighty goods like bulk building materials, metals, and some chemical products, plus certain long distance movements of containers from sea ports) can be transferable from road to rail. For the other products, particularly the voluminous goods such as food and finished consumer products, the road demand reduction is likely to result mainly from an adjustment in the geographic patterns of sourcing. That is, the goods required by consumers will be provided by suppliers from within a shorter distance range relative to the Partial scenario.

Table 14: Full scenario - Freight transport demand, billion tonne-km per year

Region	Mode	observed	Full scenario		% change over period	
		2000	2010	2020	2000-2010	2000-2020
EU15	Road	1 319	1 503	1 690	14%	28%
	Rail	250	261	299	5%	20%
	Inland waterway	127	140	158	10%	24%
	All	1 696	1 904	2 147	12%	27%
NMS10	Road	175	268	365	53%	108%
	Rail	124	143	148	15%	19%
	Inland waterway	4	4	5	0%	8%
	All	304	415	518	37%	70%
EU25	Road	1 495	1 771	2 056	19%	38%
	Rail	374	404	446	8%	19%
	Inland waterway	131	144	163	10%	24%
	All	2 000	2 319	2 665	16%	33%

b. Freight demand, internal market, and economic growth

Compared with road traffic growth, the growth in rail freight demand under the Full scenario would seem modest. This in part stems from the fact that the evolution of the European economy in the next two decades is likely to erode further the traditional base of rail freight market, such as the bulk products used as raw materials for manufacturing. This indicates that it would be necessary for the rail freight operators to adapt to the changes in the commodities mix, and to win new customers through improving reliability, responsiveness and general quality of service. Furthermore each country should enable and support the interconnectivity and interoperability of national networks as well as the access to such networks. This will help to develop new markets in the medium to long distance transport of finished products and components, e.g. to and from the sea ports and major manufacturing and distribution sites. The realisation of this potential for rail freight development could contribute significantly to the broadening of the catchments for both producers and consumers in the internal market, support the GDP growth of the Member States, and reinforce the trade ties between different regions within the EU, whilst maintaining the long term environmental sustainability of freight transport.

c. Passenger demand

The most significant input for passenger demand is the imposition of a harmonised 7% VAT on air travel. Because of this taxation, air passenger demand is likely to grow more slowly than in the Null and Partial scenarios. Nonetheless, air passenger demand will still rise significantly, particularly in the longer term: compared with the Null scenario, the air passenger demand growth rate for 2010 is dampened from a raise of 51% (N) to 34% (F) in 2010, and from 105% to 95% in 2020.

Table 15: Full scenario – Passenger travel demand, billion passenger-km per year

Region	Mode	observed	Full scenario		% change over period	
		2000	2010	2020	2000-2010	2000-2020
EU15	Car	4 094	4 768	5 453	16%	33%
	Bus/coach	402	429	428	7%	7%
	Train/metro	351	399	432	13%	23%
	Air	284	377	548	33%	93%
	Walk/cycle	215	241	252	12%	17%
	All	5 345	6 213	7 113	16%	33%
NMS10	Car	325	472	612	45%	88%
	Bus/coach	78	73	68	-7%	-13%
	Train/metro	51	51	50	-1%	-3%
	Air	14	22	32	52%	126%
	Walk/cycle	19	22	24	18%	28%
	All	488	640	786	31%	61%
EU25	Car	4 419	5 240	6 064	19%	37%
	Bus/coach	480	502	496	5%	3%
	Train/metro	403	449	482	12%	20%
	Air	298	399	580	34%	95%
	Walk/cycle	234	264	276	13%	18%
	All	5 833	6 853	7 899	17%	35%

The policy measures to encourage public transport (i.e. bus and rail modes) have led to a further increase in its travel demand. The Full scenario sees a slightly better modal balance, as well as a slight increase in the overall passenger mobility.

III.3.2.4. The Extended Scenario

The Extended scenario includes all policy measures put forward in the Full scenario. Under this scenario, there is full scale SMCP charging for road freight, and partial scale SMCP for passenger cars and air travel. Moreover, the rail freight services are to improve their quality of services significantly, over and above those assumed under the Full scenario.

a. Freight demand

The Tipmac SMCP on trucks is applied fully under the Extended scenario (50% by 2010 and 100% by 2020). This causes overall truck operating costs to rise by 27% in 2010, and 40% in 2020. As a result, in EU25 the truck tonne-kms reduce by 5% by 2010, and 13% by 2020, relative to the Null scenario. The relatively small reduction in road demand by 2010 reflects the fact that road demand adjustments are likely to be limited because of short time horizon, even if such charges are to be introduced right away. The scope of longer term adjustment is indicated by the results for 2020, which implies an average demand elasticity around 0.3.

Under this scenario, rail and inland waterway tonne-km growth rates could come close to that for trucks, for EU25 as a whole. The improvements in rail freight service quality have led to a further increase in rail demand.

Table 16: Extended scenario - Freight transport demand, billion tonne-km per year

Region	Mode	observed 2000	Extended scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Road	1 319	1 487	1 626	13%	23%
	Rail	250	266	329	7%	32%
	Inland waterway	127	141	161	11%	27%
	All	1 696	1 894	2 116	12%	25%
NMS10	Road	175	262	345	49%	97%
	Rail	124	151	158	21%	27%
	Inland waterway	4	4	5	1%	11%
	All	304	417	508	37%	67%
EU25	Road	1 495	1 749	1 971	17%	32%
	Rail	374	417	488	12%	30%
	Inland waterway	131	145	166	11%	26%
	All	2 000	2 312	2 625	16%	31%

b. Passenger demand

For the Extended scenario, car operating costs would rise on average by 38% if 1/4 of the Tipmac SMCP values are to be introduced. On air, 1/4 of the Tipmac SMCP values are also introduced, which imply an increase of air fares by 20%. As a result, the car and air demand reduces. Bus, train and walk/cycle modes gain. Overall, this also reduces the passenger mobility by 5% compared with the Null scenario: the total passenger-km grow by 27% in EU25 relative to 2000, compared with the 34% under the Null scenario.

Table 17: Extended scenario – Passenger travel demand, billion passenger-km per year

Region	Mode	observed 2000	Extended scenario		% change over period	
			2010	2020	2000-2010	2000-2020
EU15	Car	4 094	4 772	5 018	17%	23%
	Bus/coach	402	431	447	7%	11%
	Train/metro	351	395	461	12%	31%
	Air	284	390	479	37%	69%
	Walk/cycle	215	239	257	11%	20%
	All	5 345	6 227	6 662	16%	25%
NMS10	Car	325	474	562	46%	73%
	Bus/coach	78	73	72	-6%	-8%
	Train/metro	51	50	58	-3%	12%
	Air	14	22	31	54%	114%
	Walk/cycle	19	22	26	18%	35%
	All	488	642	748	31%	53%
EU25	Car	4 419	5 246	5 579	19%	26%
	Bus/coach	480	505	519	5%	8%
	Train/metro	403	445	518	11%	29%
	Air	298	412	510	38%	71%
	Walk/cycle	234	262	283	12%	21%
	All	5 833	6 869	7 410	18%	27%

III.3.2.5. Summary of freight scenario results

This section shows the results of the preceding tables in summary graphical form.

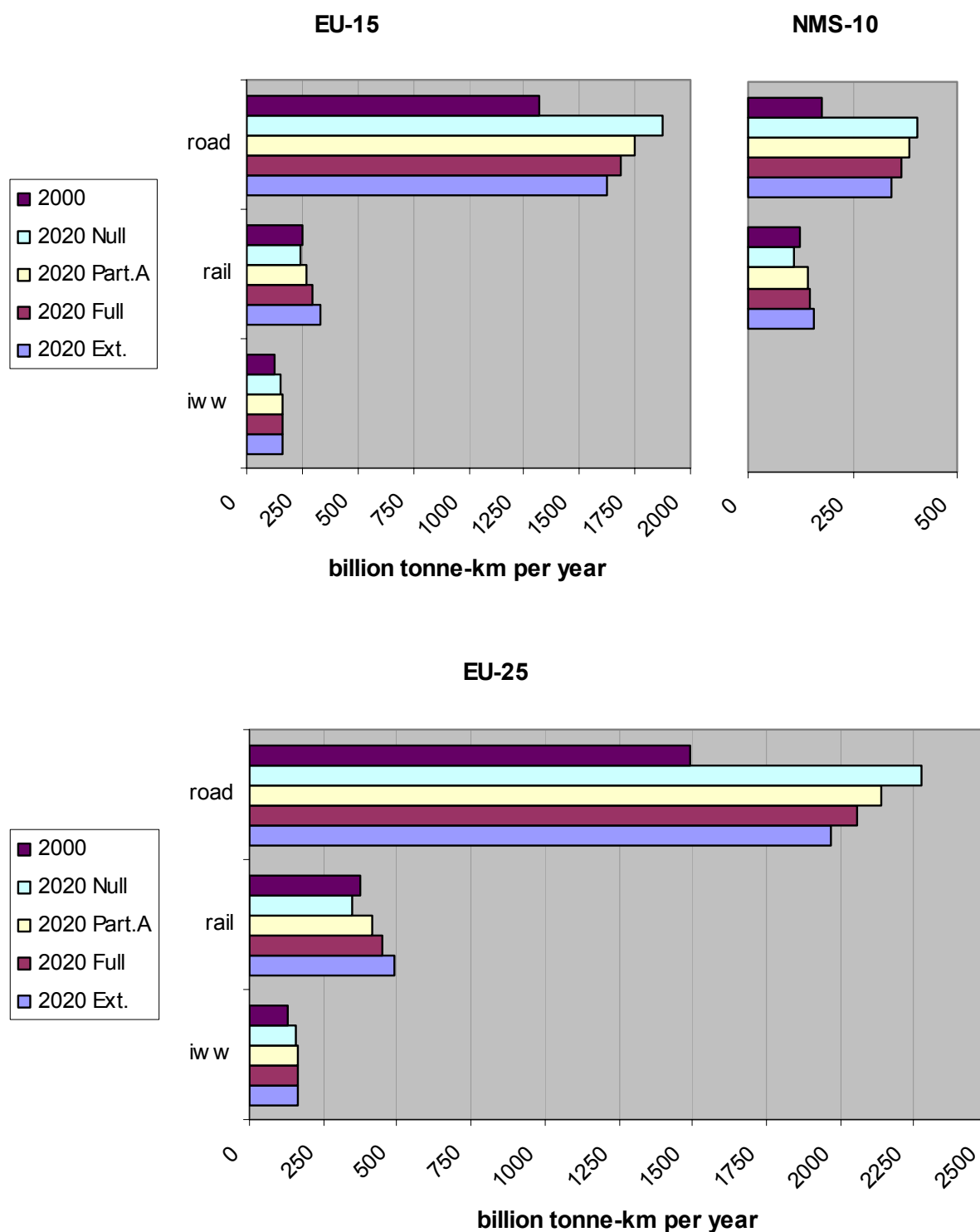


Figure 6: Scenario results by freight mode (tonne-km per year)

"iw w" denotes inland waterway.

The Partial B scenario results have been omitted from the charts above because they are based on a different growth trend and the comparison could be misleading. Instead, the differences between Partial A and Partial B in 2010 and 2020 are shown in Figure 7 below.

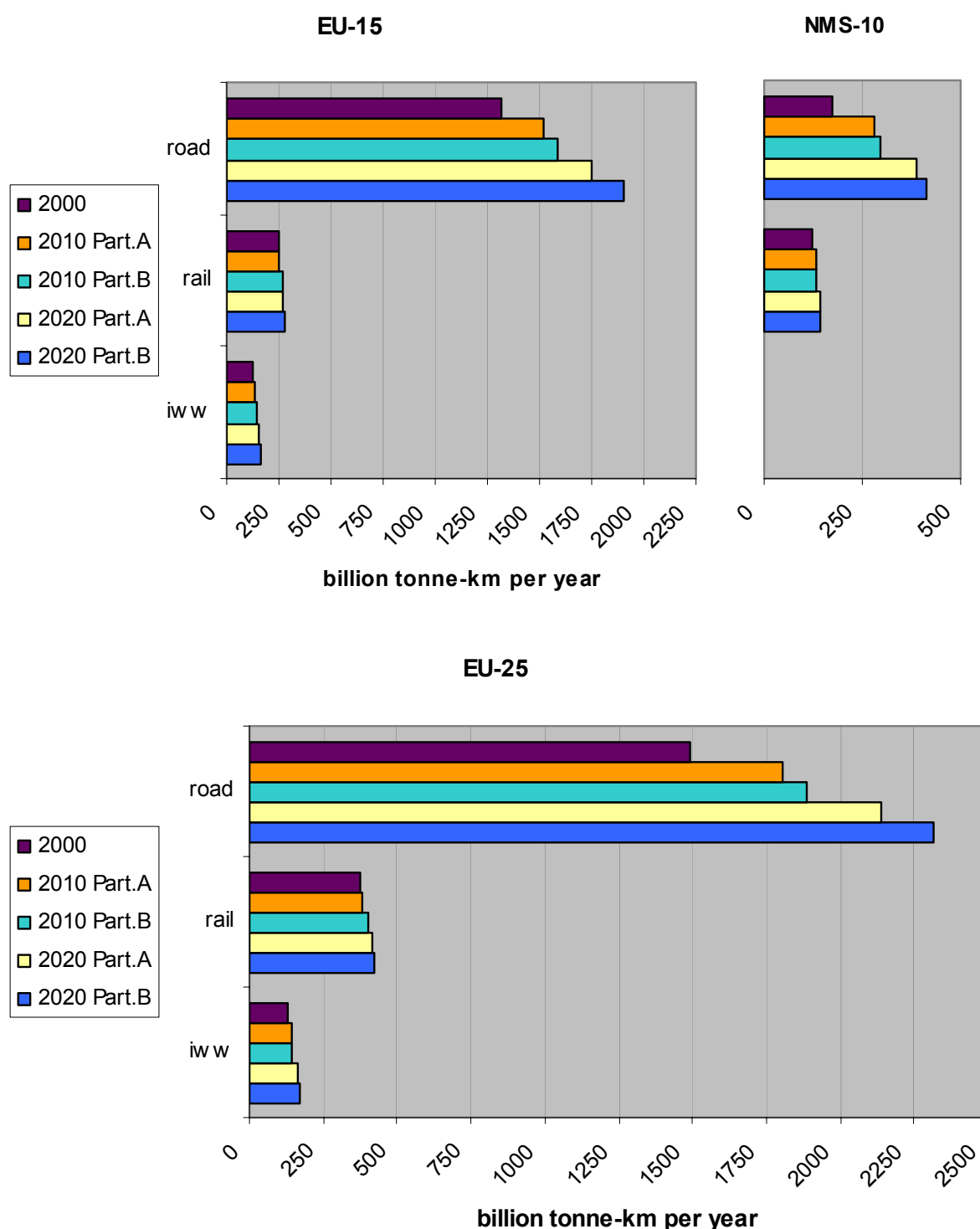


Figure 7: Alternate freight growth scenario results – Partial A and B (tonne-km per year)

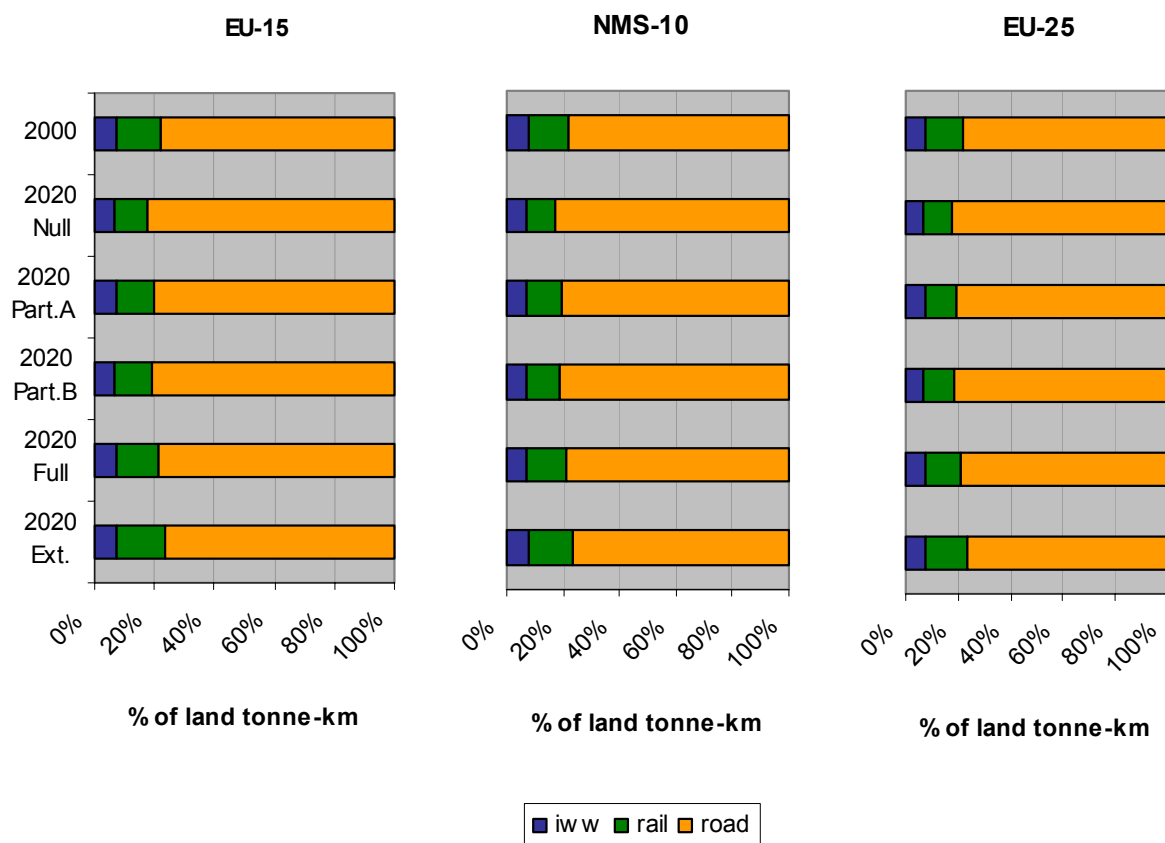


Figure 8: Scenario results, freight mode split by tonne-km

"iww" denotes inland waterway.

Table 18: Scenario results, freight mode split (% of land tonne-km)

Region	Mode	Obs	Null		Partial A		Partial B		Full		Ext	
		2000	2010	2020	2010	2020	2010	2020	2010	2020	2010	2020
EU15	road	77.8	80.4	82.6	79.5	80.3	79.5	81.1	79.0	78.7	78.5	76.8
	rail	14.7	12.4	10.6	13.3	12.5	13.5	11.9	13.7	13.9	14.1	15.6
	iww	7.5	7.1	6.8	7.2	7.2	7.1	7.0	7.3	7.4	7.4	7.6
	total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
NMS10	road	57.7	70.6	77.9	67.6	72.6	68.3	73.8	64.5	70.6	62.8	67.9
	rail	40.9	28.4	21.3	31.4	26.6	30.7	25.4	34.5	28.5	36.2	31.2
	iww	1.4	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.9	1.0	0.9
	total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
EU25	road	74.7	78.7	81.7	77.4	78.8	77.5	79.7	76.4	77.1	75.7	75.1
	rail	18.7	15.2	12.6	16.5	15.3	16.6	14.5	17.4	16.8	18.1	18.6
	iww	6.6	6.1	5.7	6.1	6.0	6.0	5.8	6.2	6.1	6.3	6.3
	total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

"iww" denotes inland waterway.

III.3.2.6. Summary of passenger scenario results

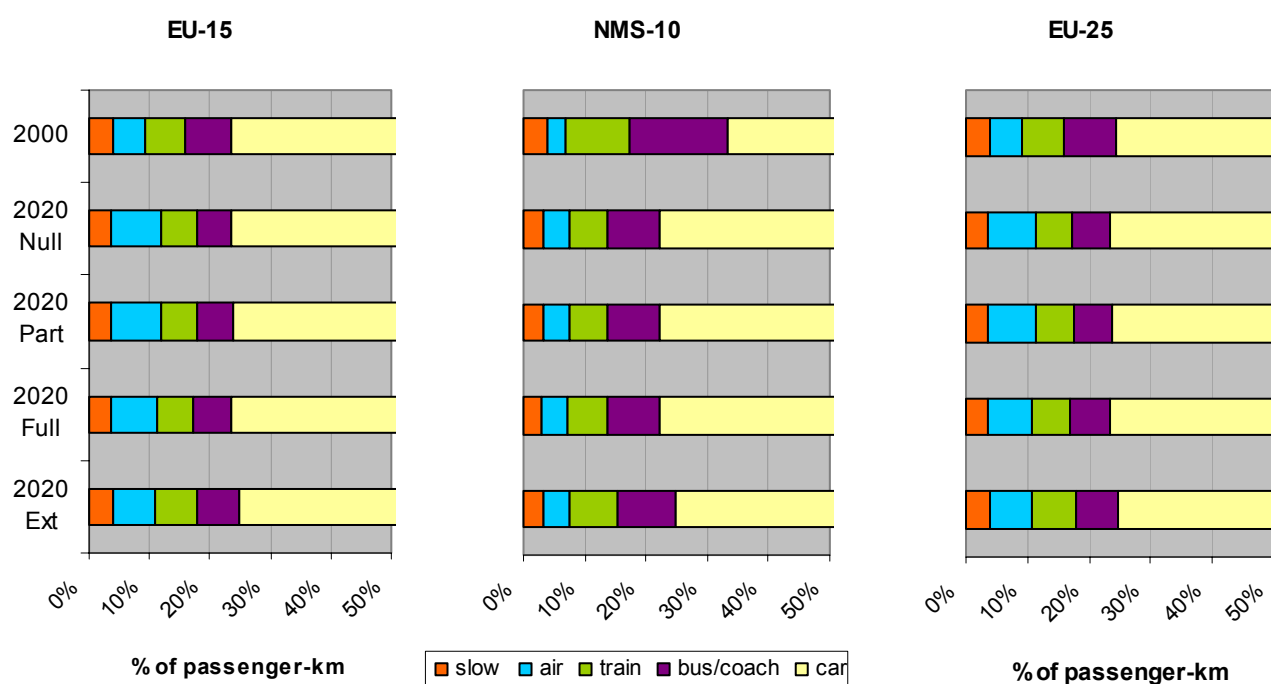


Figure 9: Scenario results, passenger-km mode split

* NOTE AXES FINISH AT 50%

Table 19: Scenario results, passenger mode split (% of passenger-km)

Region	Mode	Obs	Null		Partial		Full		Ext	
		2000	2010	2020	2010	2020	2010	2020	2010	2020
EU15	Car	76.6	76.0	76.4	75.9	76.2	76.7	76.7	76.6	75.6
	Bus/coach	7.5	6.8	5.9	6.8	5.8	6.9	6.0	6.9	6.7
	Train/metro	6.6	6.3	5.9	6.4	6.1	6.4	6.1	6.3	6.9
	Air	5.3	6.9	8.2	6.9	8.3	6.1	7.7	6.3	7.2
	Walk/cycle	4.0	3.9	3.6	3.9	3.6	3.9	3.5	3.8	3.9
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
NMS10	Car	66.6	73.6	77.9	73.5	77.7	73.7	77.8	73.8	75.1
	Bus/coach	16.0	11.4	8.5	11.4	8.5	11.4	8.6	11.4	9.7
	Train/metro	10.5	7.8	6.1	7.9	6.3	7.9	6.4	7.8	7.7
	Air	2.9	3.7	4.3	3.6	4.3	3.4	4.1	3.4	4.1
	Walk/cycle	3.9	3.5	3.1	3.5	3.1	3.5	3.1	3.5	3.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
EU25	Car	75.7	75.8	76.6	75.7	76.3	76.5	76.8	76.4	75.3
	Bus/coach	8.2	7.3	6.1	7.2	6.1	7.3	6.3	7.3	7.0
	Train/metro	6.9	6.5	5.9	6.6	6.1	6.6	6.1	6.5	7.0
	Air	5.1	6.6	7.8	6.6	7.9	5.8	7.3	6.0	6.9
	Walk/cycle	4.0	3.9	3.6	3.9	3.6	3.8	3.5	3.8	3.8
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

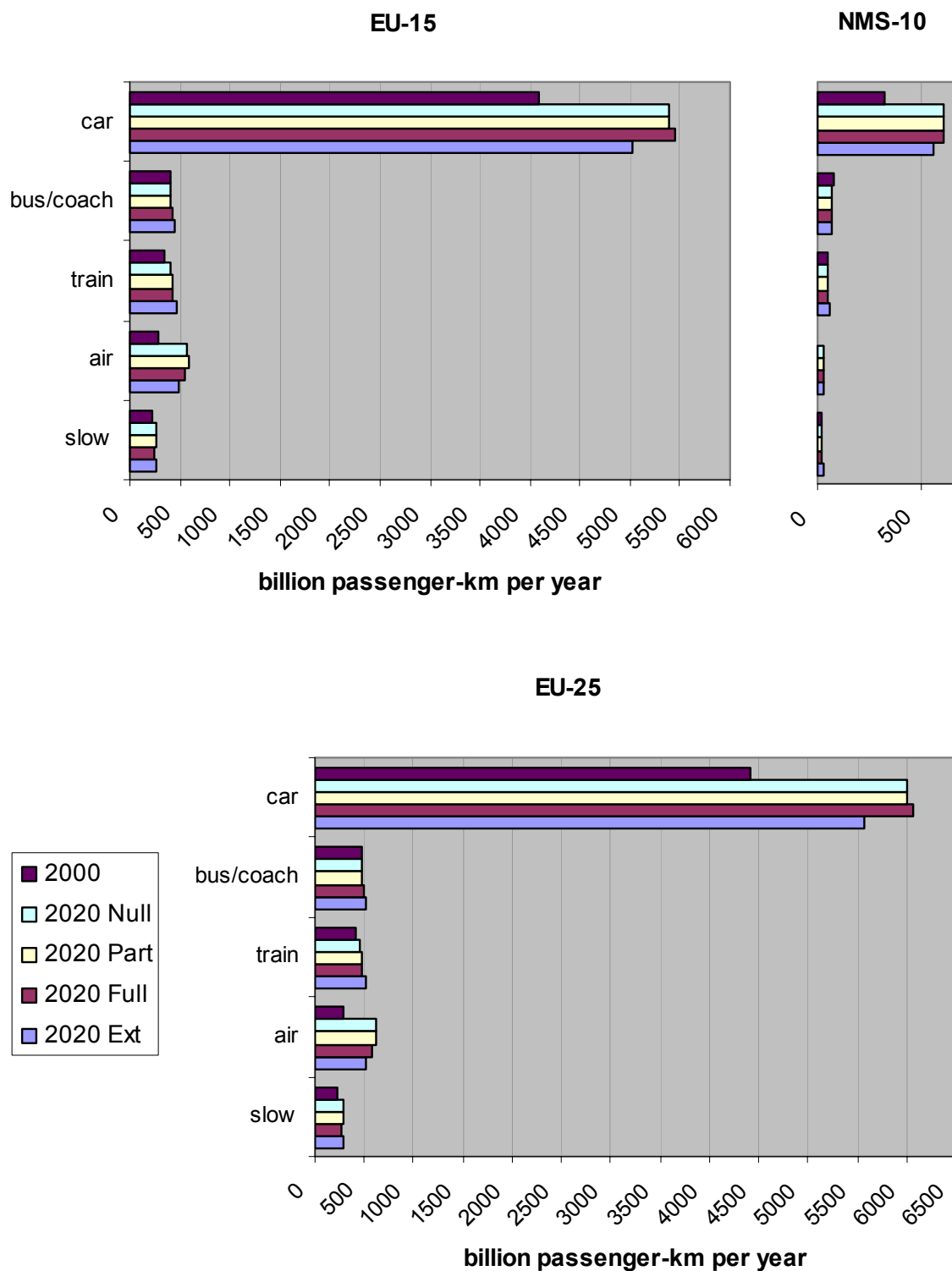


Figure 10: Scenario results by passenger mode (billion passenger-km per year for EU25)

III.4. Indicator assessment of the White Paper objectives

This chapter provides an overview of the impact of the White Paper on the evolution of the transport situations, and on the effects on the environment, social effects and economic effects. Both the past developments (1990-2005) and future projections (2005-2020) are assessed.

Whilst it is important to maintain an overview, it is crucial to remember the starting point and the local circumstances for individual Member States have been very different. Broadly speaking in the context of the White Paper, it is useful to point out that in the EU15 there have been nearly 5 years of implementation, whilst the NMS only joined the EU in 2004. Furthermore, the development trajectories are likely to remain different for some considerable time to come.

The first paragraph gives the indicator summarising analysis. The other chapters describe in more detail some specific topics, as the macro-economic assessment, regional welfare, road safety and transport emissions and energy. For a more elaborate analysis we refer to Annex XVII and the Annexes on modelling.

III.4.1. Indicators for the White Paper objectives

For most the White Paper has at least defined the preference direction, for a few there are quantitative targets given. Many White Paper objectives concern however organisational issues which are considered in the study as means to achieve the overall ends. Of these overall ends, only very few are precisely quantified.

Hence for most objectives our analysis is confined to a gradual assessment, whether the indicator, as a function of the degree of implementation of the policy, develops more in the sense of the preference direction for the objective in question, or less. As the four scenarios are constructed in a nested manner, i.e. from scenario null over partial to full and finally the extended scenario the scope, degree and intensity of the various White Paper measures increases. A comparative analysis of the outcomes, as represented by the indicators, reveals the impact of the policy or policy package that has been added by going from one scenario to the other. Not surprisingly, the modelled impact increases as well from one scenario to the other, i.e. develops further and further in the preference direction defined by the objectives. However, some policies reveal themselves more effective than others.

For EU15 countries one can apply the White Paper objectives directly as they have been formulated for these countries. The new Member States (NMS10) however come from different starting level and have had much less time for the implementation of measures. Therefore, this analysis looks more for their pattern, their growth rates and mode or vehicle specific developments. The EU15 and NMS10 figures will be reported separately for this reason.

The table below gives an overview of the indicators that could be calculated from the modelling work in ASSESS and the White Paper¹⁸ objectives that relate to them. In the following chapter, they will be compared with the modelling data as summarised in the indicators.

The list of indicators does not only cover the specific White Paper objectives, but also the wider sustainability objective. As the White Paper's final objective was to ensure the sustainability of transport in terms

¹⁸ White Paper: main text (up to page 97) as well as the annexes (from page 98), English version.

of environmental damage, safety and congestion, despite the foreseeable growth in transport volume and without restricting (too much) mobility, the results against these objectives are also assessed.

Table 20: ASSESS indicators and the related quantified objectives of the White Paper

Indicator	Scope	Unit	Quantitative objective in the White Paper
Transport volume	freight • rail • road • inland waterways • sss	tkm	• Breaking the link between the growth of car transport and economic growth: road haulage +35 % instead of predicted 50 %.
	passengers • car • bus/coach • train/metro • air • walk/cycle	pkm	• Passenger car transport +21 % against a rise in GDP of 43 %. • Maintain and improve the competitive position of Europe's air industry by creating of the single European sky and regulating the unavoidable expansion of airport infrastructure. (<i>White Paper p. 37</i>)
Modal share	freight • rail • road • inland waterways	% of tkm	• Realising a modal shift from road and air to rail and water by providing fair competition between modes and link-up modes for successful intermodality. • Maintain rail freight market share in the central and eastern European countries (35 %). (<i>White Paper p. 89</i>) • Raising the modal share of short sea shipping by linking up waterways on sea with an inland traffic. (<i>White Paper p. 12, 27, 41-42</i>) • Raising the modal share of inland waterway transport f. ex. by establishing 'waterways branches' and transshipment facilities. (<i>White Paper p. 12, 41-42</i>) • Improve the organisation of intermodal transport.
	passengers • car • bus/coach • train/metro • air • walk/cycle	% of pkm	• Realising a modal shift from road and air to rail and water by providing fair competition between modes and link-up modes for successful intermodality. (<i>White Paper p. 45-46, 104</i>) • Increase rail market share of passenger traffic (6 % → 10 %) and goods traffic (8 % → 15 %) (<i>White Paper p. 25, 27</i>) • Stimulating rail usage by increasing the quality <i>White Paper p. 30</i>) • Better use of public transport and rational use of the car.
Transport intensity	freight	pkm/population	• No quantitative targets
	passengers	tkm/ton	• No quantitative targets
Economic growth		GDP	• No quantitative targets
Employment		working places	• No quantitative targets
Spatial distribution of economic impacts		GDP/capita	• Completing the routes identified as the priorities for absorbing the traffic flows generated by enlargement, and improving access to outlying areas (<i>White Paper p.18 and 50</i>)
Transport growth and decoupling	passengers freight	pkm/GDP tkm/GDP	• Internalisation of external costs by gradually replacement of existing transport taxes with infrastructure charges and fuel taxes (<i>White Paper p. 16</i>)
Accessibility		hours	• Removing the bottlenecks in the railway network. (<i>p. 50-51</i>) • Developing motorways of the sea and airport capacity. (<i>White Paper p. 50-51</i>) • Completing the Alpine routes and providing a better passage of the Pyrenees. (<i>White Paper p. 53</i>) • Everyone should enjoy a transport system that meets their needs and expectations, in terms safety, costs, user rights and obligations and clean (public) transport accessibility.
Vehicle stock and ownership	• car • truck		• No quantitative targets
Safety	road	# fatalities	• Everyone should enjoy a transport system that meets their needs and expectations, in terms safety, costs, user rights and obligations and clean (public) transport accessibility. • Reduce the (human) costs of traffic accident and the number of deaths on the road with 50 %. (<i>White Paper p. 66</i>) • Improve safety of long tunnels in the TENs. (<i>White Paper p. 58</i>)

Energy consumption		ktoe	- Raising the share of substitute fuels (6 % biofuel penetration rate by 2010) (<i>White Paper p. 83</i>) - Replacement of 20 % of conventional fuels with substitute fuels by 2020 (<i>White Paper p. 83</i>)
Climate change		ton GHG	No quantitative targets¹⁹
Air quality		ton Nox, PM, SO ₂	- No quantitative targets - Everyone should enjoy a transport system that meets their needs and expectations, in terms safety, costs, user rights and obligations and clean (public) transport accessibility.
Noise exposure		% Ln>55dB(A)	No quantitative targets
Land take and fragmentation	road	km ²	Everyone should enjoy a transport system that meets their needs and expectations, in terms safety, costs, user rights and obligations and clean (public) transport accessibility.

III.4.2. Indicator assessment summary

This chapter gives an overview to what extent the White Paper objectives of reducing congestion and bottlenecks, greenhouse gases, conventional air pollution and noise pollution as well as improving safety and quality for transport users and those affected by the use of transport may be attained.

The table below summarise the transport, economic, social and environmental consequences of the White Paper measures. The main source for the figures is the modelling results of the four scenarios for both passenger and freight in EU25. An elaborate analysis can be found in Annex XVII.

Table 21: Transport performance in EU25 for all 4 scenarios, relative to 2000(=100)

EU25		1990	1995	2000	2005	2010				2020			
						N	P	F	E	N	P	F	E
pkm	pkm/year	82	88	100	108	117	117	118	118	135	135	136	127
tkm	tkm/year	83	88	100	108	117	116	116	116	139	136	133	131
intensity pass.	pkm/population			100	107	114	114	115	115	130	130	131	123
intensity freight	tkm/ton			100	102	103	100	100	100	113	107	107	103
accessibility (travel time)	hours			100	99	99	98	96	95	98	97	95	94
GDP (baseline)	euro			100	113	127	127	127	127	162	162	162	162
GDP+ (impact)	euro			100	113	127	134	134	134	162	163	164	165
employment (baseline)	euro			100	104	108	108	108	108	116	116	116	116
employment+ (impact)	euro			100	104	108	108	108	108	116	117	117	117
car park	1000 cars	78	88	100	106	114	114	116	116	132	132	134	124
truck park	1000 trucks	66	82	100	115	119	118	118	117	135	134	132	128
safety	road fatalities	134	112	100	86	77	68	45	28	56	49	24	13
energy	toe			100	103	102	102	102	102	107	107	106	99
CO ₂	ton			100	103	102	103	103	103	107	108	107	101
PM	ton			100	87	76	77	77	77	67	69	68	65
NO _x	ton			100	80	63	65	64	64	49	52	51	48
SO ₂	ton			100	96	92	89	89	89	94	90	89	84
noise	% hindered persons			100	104	107	107	108	108	115	116	116	113
land take	km ² road			100	100	102	107	120	118	107	113	123	121
fragmentation	km ² road			100	100	102	110	130	130	111	120	135	134

Almost all indicators show a remarkable progress in the right direction. Road safety has improved greatly since 2001. Emissions have dropped. Rail freight transport is growing. As expected, the different future

¹⁹ The White Paper happens to have on p. 166 (Annex IV) targets on air transport: reducing CO₂ emissions by 50% in absolute terms, reducing NO_x emissions by 80%, reducing aircraft noise by 10 dB / reduce the perceived noise level by 50 %. These targets are aspirational targets proposed by ACARE - the Advisory Council on Aeronautics Research in Europe. They are research targets indicating what new technology available in 2020 should attain, not at all average performance of in-service fleets. They do not belong to the common transport policy and are not assessed in this study.

scenarios considered have an increasing degree of impact, with more ambitious policy implementation producing better outcomes. However, almost none of the quantitative targets set in the White Paper on transport will be reached by 2010.

It seems that the growth of **road freight transport** is lower than was expected at the time of writing the White Paper, this is explained by lower growth of the economy. When looking at the effectiveness of the White paper measures the reduction is however less than was predicted. This means that once the economic growth will increase road transport growth will be equal (so no decoupling).

For **passenger transport** the extended scenario including social marginal cost pricing for passenger transport as well will lead to attain the White Paper goals.

In order to attain the White Paper goals on **modal split** developments the policy packages in full or the extended scenario have to be implemented. A few new Member States can maintain the traditional high share of railway transport, as it used to be in the past, this can only be achieved in the policy packages in the full or even better in the extended scenario.

Congestion (average road trip time) will reduce 3.7% for freight and 0.2% for passengers in 2010 compared to 2000²⁰ and **accessibility** will increase (travel time between regions) when implementing the White Paper policies. When carrying out the policies in the extended scenario the effect will be the largest. Freight will gain the most, in the order of rail, road maritime, inland waterways in the NMS, in the EU15 for freight the order is inland waterway, rail, maritime and road.

Due to the implementation of the White Paper the growth of the average road freight travel time is reduced with 2.3%, and there is no effect on the average travel time by car. The aim of the White paper measures is to reduce congestion on the road. The results show that there will indeed be an improvement. This is the case in 2010 and also in 2020.

With this ranking also objectives concerning **intermodality** are attained. Overall the reduction of travel times for freight amount to 4.9% in the EU25 in 2010 in the extended scenario leading to a more efficient use of the network and vehicle stock. For passenger transport, travel times reduce with 2.0% in 2010 in the extended scenario.

The **accessibility of the regions** will increase, the extended scenario leads to a better accessibility of regions, it should be kept in mind that some peripheral regions in NMS are not equally enjoying improved accessibility as others.

The White Paper objective “breaking the **link between the growth of transport and economic growth**”, aimed for a reduction **of the road freight growth between 1998 and 2010** from the expected 50% to the desired 38%. However, the SCENES results show that the growth without White Paper policy intervention is only 23% (and not 50%), due to lower GDP growth rates than expected in the period 2001-2005. Due to the implementation of the White Paper the growth of the road freight transport is reduced with another 2.2%.

²⁰ Null scenario: overall 6.8% decrease (2010 versus 2000) of trip time due to changes in transport demand, and faster transport by rail and inland shipping. However, road transport trip time will increase with 9.1% for freight transport and 3.1% for cars. Full scenario: overall 1.7%, less decrease because of the rail success. This leads to a general increase in rail trip length and therefore trip time in Europe. The road travel time now reduces 3.7% for freight and 0.2% for passengers (2010 compared to 2000).

For passenger transport by car, the goal was an increase in traffic of 21% against a rise in GDP of 43%. Based on the SCENES results it is possible to confirm that the growth in car passenger transport is 17%, lower than anticipated. However, when the White Paper would be fully implemented or when the extended policy scenario would be implemented, then passenger transport by car is growing faster than the reference development of the Null scenario in 2010, but slower in 2020²¹.

Implementing the measures of the White Paper is positively affecting the **EU economic growth**, particularly when marginal effects can be detected, although the impacts on **GDP and employment** are quite small. This moderately positive impact is higher when the investment and policy measures are well integrated and charging policies are compensated by a proportionate reduction of direct taxes.

The result of the analysis on **regional welfare** shows that for 2010 for all scenarios the effects on cohesion tend toward a slightly more unequal distribution of GDP/capita and the Gini-coefficient, with regions where we observe above average negative impacts as well in the periphery as well as in the centre of Europe. However, cohesion indicator values are rather low, not more than 0.3, so this relationship cannot be considered as strong.

According to the **safety** analysis, none of the Member States will reach the 50% reduction in 2010 (P scenario). Some states are approaching the objective (Latvia, France, Portugal), whereas Czech Republic still shows an increase in fatalities. For the 25 EU Member States the overall predicted relative fatalities for this scenario is 73%. In case of a full implementation of the White Paper, it is estimated that the EU as a whole the objective will be reached in 2010. However, in this scenario a rather rigorous implementation of (among other things) e-safety is assumed, which is responsible for a large part of the reduction.

The N scenario predicts a limited increase in EU15 transport **energy consumption** over time, and a strong growth in energy consumption in new Member States²². Forecasted energy consumption in the P scenario is somewhat lower than that for the N scenario, and that in the F scenario again is a bit lower than that in the P scenario. The E scenario is the scenario with the lowest transport sector energy consumption. In the EU15, this policy scenario even is predicted to bend the upward trend in energy consumption into a decrease.

If the biofuel policy is excluded from the analysis, the N scenario leads to an almost stable **CO₂ exhaust emission** prediction for the EU15 countries. The stableness of the transport emissions is due to the fact that the transport activity growth will be compensated mainly by increases in the fuel efficiency for all road vehicles, through dieselisation of the fleets as well as through genuine technology improvements. In the new Member States the emissions will increase, due to the much stronger growth in transport activity. Compared to N, the P and F scenario would lead to a very small decrease in CO₂ emissions, due to the biofuel measure. As for energy consumption, CO₂ emissions in the E scenario are significantly lower than those in the other scenarios.

The major driver in all scenarios for the future reduction in **NO_x and particulate emissions** is the introduction of road vehicles complying to the most recent emission standards. For **SO₂ emissions**, this is in first place the introduction of low(er) sulphur fuels in the road transport sector. Overall, there is no significant change in total emissions for these pollutants between the N and P scenario. The F scenario shows a modest decrease in overall emissions compared to the N and P scenarios. Nevertheless, the F

²¹ The reason is that, due to the White Paper, air transport will grow slower and therefore car transport grows faster. This car transport growth slows down again in 2020, when social marginal cost pricing is introduced.

²² The 4 new Member States covered by the model TREMOVE, see Annex VII.

scenario shows that an important decrease in rail emissions might be possible by entering the dialogue on environmental improvements with the rail industry. In the E scenario, full implementation of marginal social cost pricing in the freight sector and partial marginal social cost pricing for passenger car and air transport will lead to a further decrease in the emissions. The strong reductions in exhaust emissions for these pollutants, will lead to an increasing importance of well-to-tank emissions. Therefore the predicted percentages reductions in total well-to-wheel emissions are significantly lower than the percentages reductions in exhaust emissions.

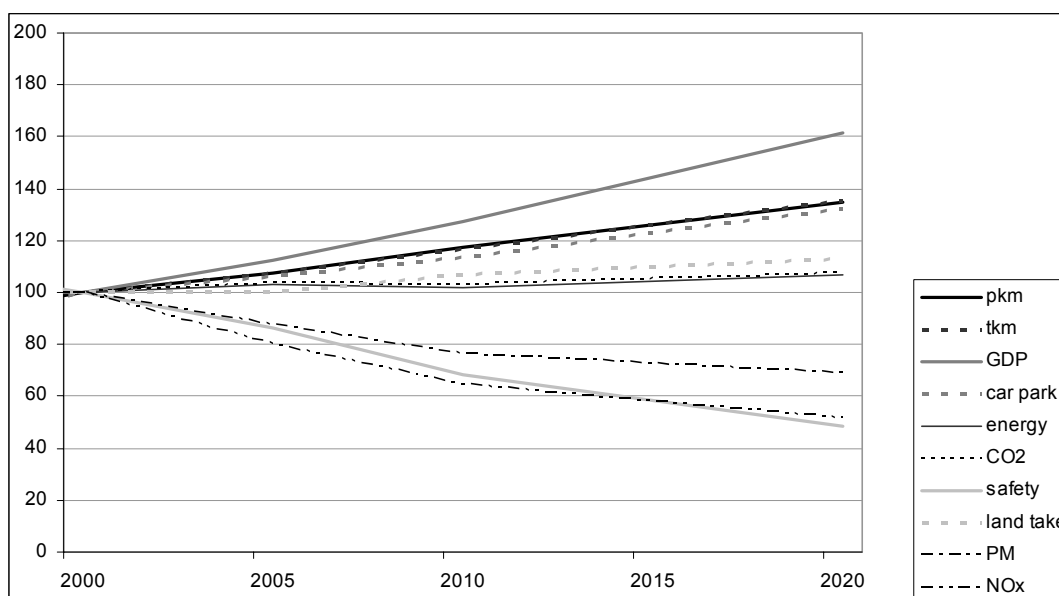
It should be recalled that the most effective environmentally actions²³ of the EU, notably effective in reducing CO₂ and pollutant emissions from road vehicles, are outside explicit White Paper measures. They constitute the background developments and context for the different scenarios.

The **noise** exposure and annoyance of the population is set to increase in all scenarios with only relatively minor differences between them. Total road traffic remains about 10 times more annoying than rail transport. The extended scenario gives the lowest increase in the number of people being highly annoyed.

Land take and fragmentation are no White Paper objectives, they however are part of the more general sustainability objective. Both are determined by the infrastructure and the intensity of the infrastructure use. In particular road transport is expected to increase strongly and the traffic pattern to become spatially more spread out. Therefore the use intensity on the whole network is expected to increase, and hence fragmentation effects. Their impact will be the worse in regions/countries, the lower the prior use intensity has been or the more confined traffic has been before.

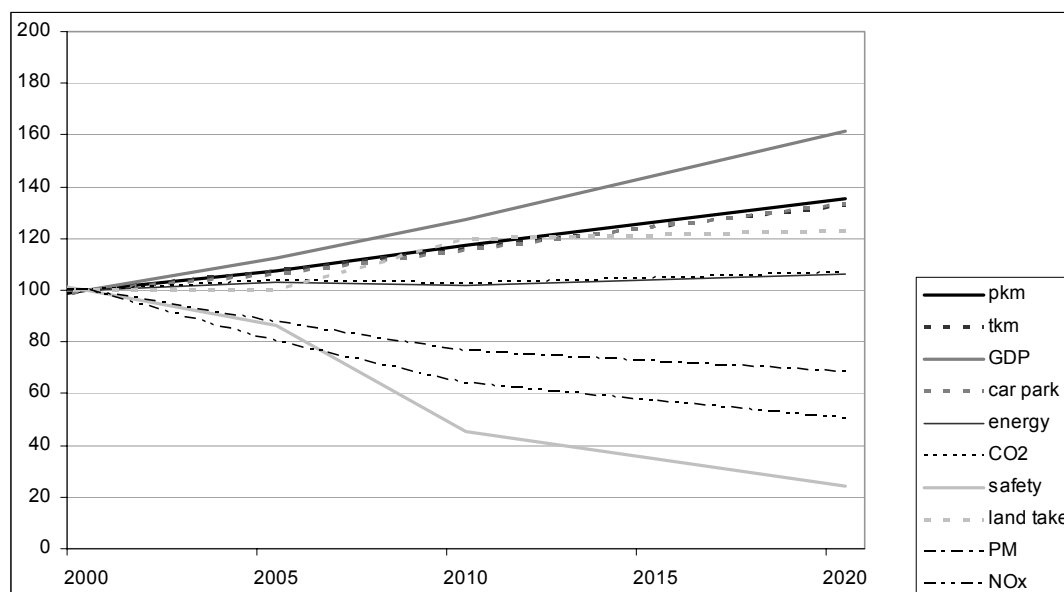
The figures below give an overview of the main expected impacts EU25, P and F scenario.

Figure 11: Transport performance in EU25 for the P scenario, relative to 2000(=100)



²³ E.g. measures affecting vehicle technology as the Euro-standards and the ACEA agreement.

Figure 12: Transport performance in EU25 for the F scenario, relative to 2000(=100)



III.4.3. Macroeconomic impact

The estimate of the macroeconomic impact of the ASSESS policy scenarios has been carried out using the ASTRA System Dynamics model. Traditionally, three main approaches are used to analyse links between transport and economy: Macroeconomic approach, Microeconomic approach and General Equilibrium approach. Each of such approaches focuses on specific economic variables and none of them is able to fully address the multiple dimensions involved in the White Paper measures. System Dynamics, even if not specifically devoted to analyse the links between transport and economy, has been recently used for this objective in several European research projects and proved its flexibility and capability of including both micro and macro variables in the analysis.. For these reasons, completeness and availability, ASTRA has been selected as the most suitable model to assess the macroeconomic effects of the ASSESS policy scenarios.

The ASTRA model is a System Dynamics model at the European scale focused on describing the linkages between transport, economy and environment²⁴. Within the ASTRA model, the linkages between the transport sector and the economy are simulated within the macroeconomic module (MAC), which is built as a demand-supply interaction model. In the short run the demand side is dominating (Keynesian approach) while in the long run the supply side determines the path of development (revised Neo-classical approach). The macro-economic module of ASTRA includes also the effects of taxes and pricing policies on disposable income. Furthermore, transport pricing and taxes make also transport a more expensive input within the I-O table, thus affecting the whole economy. Private and public investments are modelled separately in ASTRA and the model takes into account the existence of a *crowding-out* effect of public investments. Therefore, public investments can have positive macroeconomic impacts, due to the multiplier effect, but also negative ones, as they reduce private investments and disposable income. In other words, the net results of public expenditure and taxes is not defined in advance but depends on the intensity of the multiplier effects and of the crowding-out for the specific policy implemented. Thanks to this structure, the ASTRA model is able to simulate a wide range of impacts of transport measures within a complex dynamic structure of links between transport and the economy. Indirect environmental effects of

²⁴ LOTSE - Quantification of technological scenarios for long-term trends in transport. JRC – IPTS Seville

transport policy are not simulated in ASTRA. For instance, if a pricing policy reduces traffic and air pollution and reduces the number of working hours lost for illness, this is not recognized in the model.

In the ASSESS project the most recent version of the ASTRA model, developed for the LOTSE project (IWW and TRT, 2004), has been then applied to assess the economic impacts of the three modelling scenarios developed in WP3 (Partial, Full and Extended). In addition to the three scenarios, additional sensitivity analysis has been carried out.

The results of the assessment are moderately positive: all the scenarios show an improvement, although in some cases very limited of the main macroeconomic (see table below, where results are shown in terms of absolute difference between yearly growth rates of GDP and employment in the period 2000 – 2020) with respect to the Null scenario.

Figure 13: ASTRA results: absolute difference between yearly growth rates with respect to the Null scenario

Scenarios	GDP			Employment		
	EU25	EU15	NMS10	EU25	EU15	NMS10
Partial	0.047	0.047	0.044	0.024	0.026	0.022
Full	0.080	0.081	0.066	0.040	0.044	0.028
Extended	0.100	0.100	0.093	0.049	0.053	0.039

ASTRA model

To understand the size of the effects one can take into account that a difference of 0.1 in the yearly growth rate leads to a 2% higher GDP at 2020.

Impacts on GDP and employment are higher for the Extended scenario, while the Partial scenario is the one with more limited macroeconomic impacts, and the Full scenario is in between. As the main feature of the Extended scenario is the full implementation of the infrastructure charging (with a correspondent reduction of direct taxes) the better performance of this scenario can be explained by a more efficient distribution of resources between private and public consumptions, due to the introduction of pricing policies together with the reduction of direct taxes.

In general, the size of the increments is small, although it should be remarked that the main objective of the White Paper is not economic development per se, rather the increase of the general welfare of European citizens. Therefore, largely positive macroeconomic impacts were not expected. In brief, the simulations made with the ASTRA model suggest that implementing the measures of the White Paper is positively affecting the EU economic growth, particularly when marginal effects can be detected, although the impacts are quite small.

The sensitivity tests carried out suggest that: a) the option of using the additional revenues from infrastructure charging to finance the TENs projects instead than reducing direct taxes does not change significantly the final effect on economy; b) investments without accompanying policies are not able to stimulate economic growth, due to the crowding out effect; c) in the longer term speeding up vehicle innovation through a support to private investments in the automotive industry can have slightly positive effects.

A further sensitivity scenario has been run to test the effect of a different version of the Partial scenario (called Partial-B scenario), defined at the very end of the project, where infrastructure charging has been quantified according to current tolling and the Eurovignette directive and where measures concerning the

harmonisation of checks and penalties on road freight transport have been considered as not having a significant effect on the road freight costs. In brief, road freight costs grow less in Partial-B scenario. The results of the simulation are in line with the other scenarios: the difference with respect to the Null scenario is little but positive, the impact on GDP and employment growth is slightly better than in the original Partial scenario, as the transport costs are lower.

III.4.4. Regional welfare

An analysis of the TEN network²⁵ with the CGE model (see Annex VII) shows that the overall effect of the TEN for EU25 is +0.16% of GDP. For the 15 old Member States we calculate an impact of +0.16% and for the new Member States an effect of +0.25%. One can see that some of the projects especially in the periphery and the new Member States have a considerably higher impact than those in the centre of Europe. We have to mention at this point that the impact of the projects on modal choice has been considered. However, the impacts of congestion on the network have not been considered in the calculation of transport cost, because the cost data have been calculated with a pure network model, and not with a full transport model. Therefore, one has to assert that the calculated benefits in the centre of Europe might underestimate the full benefits of these projects.

The results show that effects are the highest in those regions in which the new infrastructure is actually implemented, as these regions benefit from higher transport cost savings than those regions, which are not directly connected. However, the new infrastructure has positive effects even for regions located further away from the new infrastructure. There are also negative effects due to a loss of competitive advantage, but they are small. Negative effects in general do not exceed -0.04% of GDP.

The overall picture shows that there are considerably high impacts on GDP in Spain and Portugal, in southern Italy, in Greece, Ireland and Southern Scandinavia that stem from the implementation of the Essen list of projects. The new list of priority projects has added projects in the new Member States that especially aim at connecting the centres and capital regions in those countries. These projects also show positive effects in the regions directly connected to these new roads and rail lines, especially in Poland, Slovakia, Hungary and Bulgaria.

The policy package, in general, is not in conflict with the policy goal of territorial cohesion within the EU. It rather contributes by a small amount to the achievement of cohesion in the EU25.

An alternative scenario²⁶ – a longer list of TEN and TINA projects – shows that the overall effect of the policy package is +0.32% of the GDP forecast for 2020 for the whole EU25, the effect for the old Member States is +0.32% and for the 10 new Member States (NMS10) it is +0.68%. So, the effects in the new Member States are considerably higher, because the full list of all TINA projects scheduled to be completed until 2021 has been considered. Because of the less developed networks in these countries these new infrastructure contribute to a higher amount of transport cost savings in these countries than in the old EU Member States (EU15).

²⁵ In the first scenario we analysed the effect of the addition of the complete list of TEN priority projects (see European Union, 2004) excluding the high-speed rail interoperability project on the Iberian Peninsula, Malpensa Airport, the Danube river improvement between Vilshofen and Straubing and the global navigation and positioning satellite system Galileo to the European transport network. The reason for this exclusion of projects, is that the CGE runs rely on the IASON project runs, where this decision was taken, see Deliverable 6 of IASON.

²⁶ The second scenario analysed is the policy scenario consisting of all TEN and TINA projects in the EU-25 plus Bulgaria and Romania which are completed until the year 2021. For a full list of the projects included, we refer the reader to IASON D6 (see Bröcker et al., 2004).

To conclude, CGEurope model results predict an impact by the complete list of TEN and TINA transport projects of +0.32% on GDP in the enlarged EU and an impact of +0.68% on GDP in the new Member States. With respect to the distribution of GDP/capita it tends to favour the regions with a lower GDP/capita in the reference situation rather than the richer regions, so the policy package contributes to the achievement of the territorial cohesion goal.

III.4.5. Road safety

In the White Paper, the goal is stated to halve the number of people killed in traffic between 2001 and 2010.

The assessments of the future number of fatalities were carried out in April and May of 2005, using the then available data on the number of fatalities. The assessment was part of the midterm review of the Road Safety Action Program (Ecorys, 2005). Data of 2004 was at that moment not yet available. In 2004, the number of fatalities in Europe decreased more than usual. For some large countries the decrease was very substantial (Spain: -12%), France (-8%), some smaller countries had even better results (Netherlands -19%, Denmark -15%). This overall decrease is of course promising. Unfortunately the 2004 results are not available for all countries. Also, the main assessment of the projections of fatalities to 2010 and 2020 is not very sensitive to temporary fluctuations in a single year. We have therefore concluded that the estimated number of fatalities should not be adjusted for the sudden decrease in 2004.

When 2005 proves that the decrease in 2004 indicates a real trend break, this will mean that it will be a lot less difficult to achieve the goal. As for now, we are not convinced that this is the case, and we prefer to be not too optimistic in our assessment of predicted safety.

For the four scenarios used in the estimation of the safety effects, the conclusions are as follows.

III.4.5.1. N-scenario: none of the White Paper measures have been implemented.

For this scenario, the predictions of the number of fatalities in 2010 and 2020 are based upon autonomous changes, corrected (in a negative way) for those White Paper measures that have been implemented and effective. Thus, effects of the measures with high or very high likelihood to be implemented are excluded. According to this scenario, the objective of a reduction in traffic fatalities of 50% will not be reached. None of the EU Member States would reach a 50% reduction in 2010 and for some Member States there would even be an increase in fatalities (Slovakia and Czech republic). For the 25 EU Member States the overall predicted relative fatalities for this scenario is 87%.

III.4.5.2. Partial and most likely implementation (P-scenario)

For this scenario, the predictions of the number of fatalities in 2010 and 2020 are based upon autonomous changes (including the effects of the measures with high or very high likelihood, see Annex XI) in the relative fatality rate of road users and on changes in mobility rates. The assessment is based on a projection of a time series of the total number of fatalities. This approach is expected to lead to an underestimation of the number of fatalities. The results may therefore be a little too optimistic (Annex XI.4.1).

According to this scenario, none of the Member States will reach the 50% reduction in 2010. Some states are approaching the objective (Latvia, France, Portugal), whereas Czech Republic still shows an increase in fatalities. For the 25 EU Member States the overall predicted relative fatalities for this scenario is 73%.

III.4.5.3. Full implementation scenario (F-scenario)

For this scenario, the predictions of the number of fatalities in 2010 and 2020 are based upon autonomous changes in the relative fatality rate of road users, on changes in the relative fatality rate of road users caused by all measures contained in the White Paper, and on changes in mobility rates. According to this scenario, part of the EU Member States reach a 50% reduction of traffic fatalities. The majority of the Member States still show a prediction of relative fatalities which is higher than 50%, although not to a great extent. The overall estimate for all 25 Member States is 49%, so for the EU as a whole, according to the full implementation scenario, the objective will be reached. However, in this scenario a rather rigorous implementation of (among other things) e-safety (measure 55) is assumed, which is responsible for a large part of the reduction (without measure 55 the reduction of the full scenario would be 25%).

III.4.5.4. Extended scenario (E-scenario)

In the E-scenario, the extended scenario, all the measures stated in the White Paper are implemented. Also, additional measures are included in the scenario (e.g. sustainable safe infrastructure in urban and rural areas all over Europe, daytime running lights). According to this scenario, all EU Member States reach the objective of a 50% reduction in 2010. The overall predicted relative fatalities comes down to 30% for all 25 EU Member States.

Although the full implementation and the extended scenario show positive estimates, care should be taken to be too optimistic. Many assumptions were made to come to these estimates. As stated before, the full implementation scenario is not the most likely scenario, and as the extended scenario is based on the full implementation scenario, this scenario is even less likely. Even if the full implementation scenario will not be reality, proposed additional measures are obviously necessary.

A more realistic estimate would be found for a scenario without measure 55 (e-safety). In our assessment we assumed a far-reaching implementation of e-safety. However, we think this far reaching implementation is unlikely to be fully carried out. A reduction to 40% may be the maximum achievable. This would still ask for vast investments in safe infrastructure. A very rigorous programme might lead to a 50% reduction.

Of course, these estimates are not based on the possibly enduring effect that was seen in 2004 in some countries. Reality may turn out to be (and hopefully will be) more positive than the estimated reduction of fatalities in this report. However, as stated before, we propose to be careful with considering the 2004-results to be absolute and definite. History has proven that a sudden decrease in the number of traffic fatalities may well be followed by a substantial rise in the next year.

III.4.6. Transport emissions and energy

III.4.6.1. Energy consumption

In the EU25 total energy consumption will remain almost stable. The growth in transport activity can be compensated mainly by increases in the fuel efficiency for all road vehicles. However, the expected growth in air traffic emissions – with their higher specific climate impact – risks to offset all improvements for surface transport. In the new Member States, transport energy consumption will increase. The growth in transport activity is much stronger in these countries, and is not offset by the improvements in energy efficiency.

The figures for energy consumption for 2000-2020 are being estimated with the TREMOVE model²⁷.

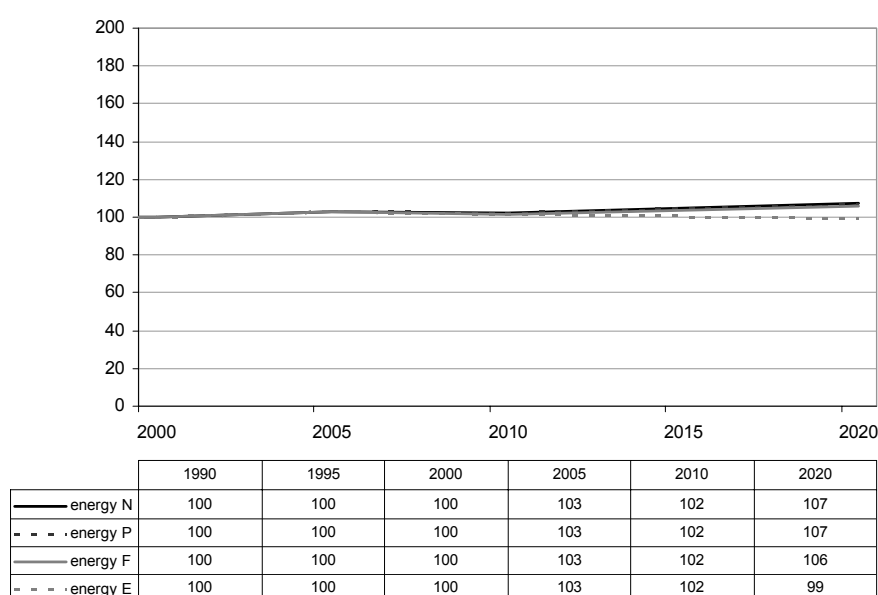
The almost constant energy level is a direct consequence of the voluntary agreement of car producers to reduce CO₂ emissions of new cars, as well as of the continuous development of technologies to reduce fuel costs in the road freight sector. However, the voluntary agreement is not a White Paper measure.

A White Paper measure that contributes to an energy reduction is the promotion of clean urban transport, as it leads to an accelerated replacement of older, less fuel-efficient vehicles. Improvements in air transport efficiency, by way of the Single European Sky programme, will not offset the strong increase in air transport activity.

The predicted energy consumption for the N scenario is somewhat higher than that for the P scenario. This is in line with the fact that total transport activity, especially for freight, in N is a bit higher than in P.

Compared to the P scenario, total road vehicle energy consumption is higher in the F scenario. The reduction in truck transport caused by the introduction of social marginal cost pricing for road freight leads to a decrease in truck energy consumption, but this does not compensate the increase for road passenger transport. Full implementation of marginal social cost pricing in the freight sector and partial marginal social cost pricing for passenger car and air transport will lead to a significant decrease in the 2020 energy consumption of road and air transport in the E scenario. In the EU25, this policy scenario even is predicted to bend the modest upward trend in transport energy consumption into a decrease.

Figure 14: Energy consumption in toe, EU25, 2000-2020, 2000 = 100



Source: TREMOVE model, see Annex VII.

A further analysis of the components that lead to an almost constant energy consumption is given in the table below. The table shows clearly that the technological component balances out the activity growth. The influence is modal shift is rather modest, and negative. The reason for this is the increase of the truck share in the total tonne-km (both road and rail increase, but road increases faster).

²⁷ See Annex VII for a description of TREMOVE and the model results.

Table 22: Determinants of energy consumption in transport, EU15

Energy consumption increase versus 2000 due to:	2010 N	2010 F	2020 N	2020 F
growth in tonne-km and passenger-km	15,10%	15,55%	31,89%	32,11%
modal shift	0,83%	0,63%	1,79%	1,35%
technological improvement	-13,08%	-13,38%	-22,55%	-22,85%
TOTAL	1,05%	0,75%	4,60%	3,56%

III.4.6.2. *Climate change*

Overall, the transport sector shall contribute to achieve the commitment of the European Union according to the Kyoto agreement²⁸, namely to reduce its greenhouse gas emissions by 8% in the period 1990 to 2008/2012. Despite the growth in transport, CO₂ emissions²⁹ from only grow modestly from 2000 to 2010 and 2020. It seems however out of reach, that emissions go down on an average 8% over the period. This would need major efforts.

Progress depends to a large degree on improvements for car transport and a containment of road freight emissions. However, the expected growth in air traffic emissions – with their higher specific climate impact – risks to offset all improvements for surface transport.

The stableness of the CO₂ emissions is due to the fact that the transport activity growth will be compensated mainly by increases in the fuel efficiency for all road vehicles, through dieselisation of the fleets as well as through genuine technology improvements. For cars, the latter improvements are driven by the voluntary agreement of the car industry to reduce CO₂ emissions of new cars. Also the Single European Sky policy – compensation for a part the large air transport growth –, as well as the accelerated replacement of older urban busses contribute to this stabilisation of CO₂ emissions. The small increase of CO₂ emissions for the freight sector is, compared to passenger transport, explained by the stronger growth in freight transport and the lower expectations for future fuel efficiency improvements for trucks (compared to cars). In the new Member States, CO₂ emissions will increase. The growth in transport activity is much stronger in these countries, and is not offset by the improvements in energy efficiency.

The differences in transport flows between the N and P and F scenarios are limited, except for the increase in freight rail transport, which leads to an increase in freight rail emissions. However, in the P and F scenario it is also expected that the 5.75% (2010) and 8% objectives on biofuel penetration are reached. This leads to a 6% CO₂-gain in the EU15 states by 2020, as well as a significant reduction of the CO₂ growth in the new Member States.

As for energy consumption, 2020 road and air CO₂ exhaust emissions in the E scenario show a significant decrease compared to the other scenarios, which is only partially compensated by an increase for rail and inland waterway. This policy scenario would even lead to a reduction of CO₂ exhaust emissions of about 5%, without accounting for the introduction of biofuels (which gives an extra 6% gain).

The figures below show the different components of the CO₂ emissions: the exhaust emissions and the well-to-wheel emissions. For the well-to-wheel component, a variant with and without the biofuel policy is shown.

²⁸ Although the Kyoto agreement is mentioned once (p. 22) in the White Paper, it is not a specific White Paper objectives.

²⁹ Both exhaust as life cycle (well to wheel) emissions.

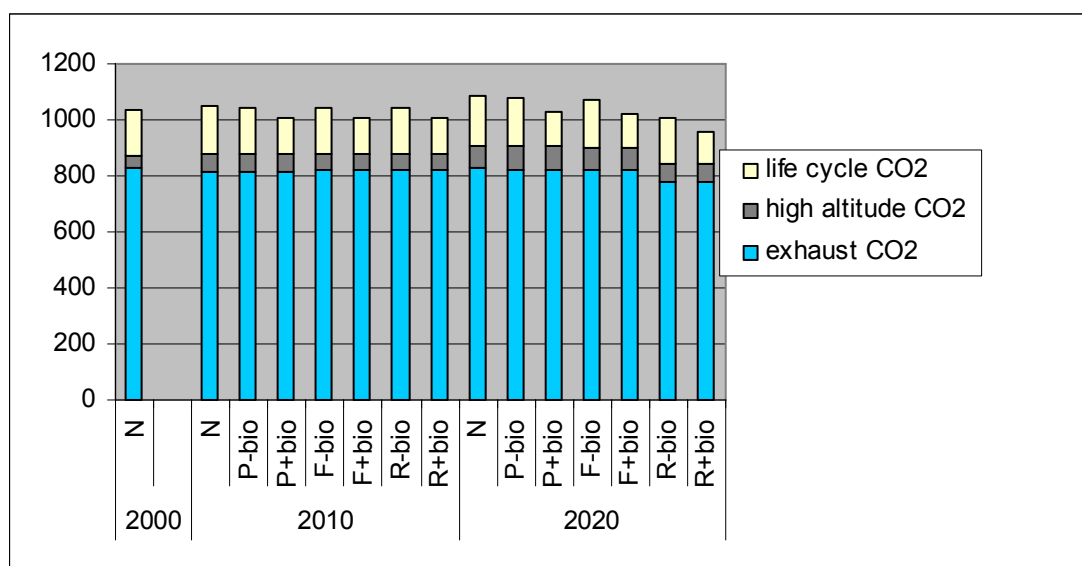


Figure 15 : EU15 CO₂ emissions by scenario, in million tonnes

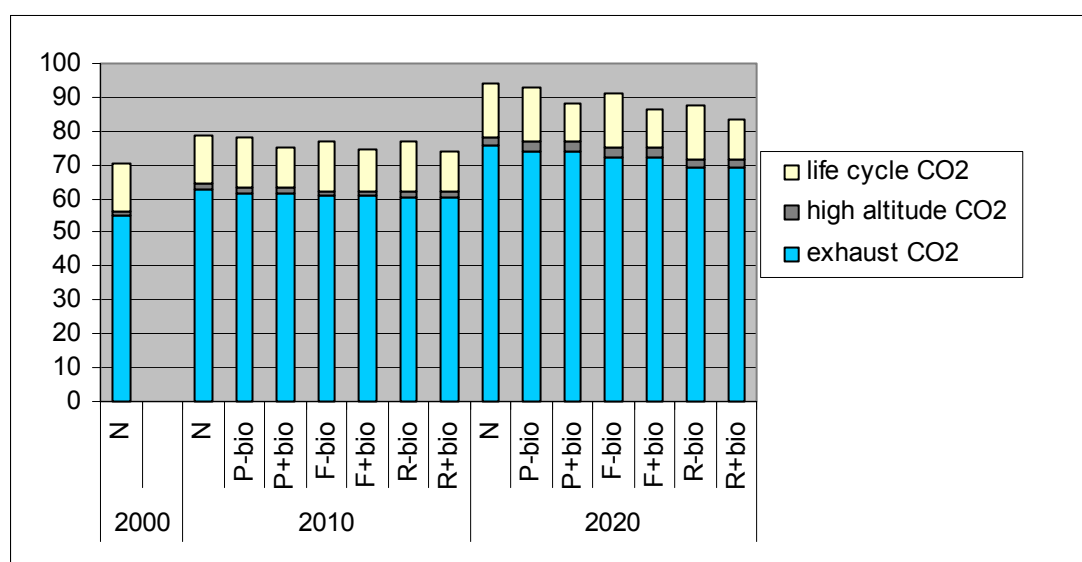


Figure 16 : NMS4 CO₂ emissions by scenario, in million tonnes

Source: TREMOVE

Life cycle: well-to-wheel emissions. High altitude: air transport emissions.

-/+ bio: excluding or including the biofuel policy, visible in the life cycle emissions.

III.4.6.3. Emissions and air quality

Although TREMOVE also includes calculations for pollutants as CO and volatile organic compounds (as methane and benzene), the discussion in this section is restricted to the pollutants considered to be most relevant in this project, i.e. NO_x, particulates (PM) and SO₂. It should be recalled that most of environmentally relevant actions of the EU, notably effective in reducing CO₂ and pollutant emissions from road vehicles, is outside explicit White Paper measures.

The figures below show the predicted evolution of vehicle exhaust emissions in the 4 scenarios relative to the year 2000 levels, for NO_x, particulates (PM) and SO₂. The major driver for the EU15 reduction in NO_x and particulate emissions is the introduction of road vehicles complying to the most recent emission standards (EURO IV for cars and EURO V for trucks). For busses the policy promoting a faster introduction of clean vehicles of course accelerates this effect. The impact of the new emission standards on

particulate emissions is to significant extent hampered by the rising share of diesel cars in the fleet, resulting in a stronger decrease in freight PM emissions than passenger PM emissions. NO_x emissions from passenger road transport decrease stronger than those from freight road transport however. For air transport the reduction of flight route lengths for aircrafts compensates to a certain extent the strong growth for this mode, but it is only a small step towards the general objective on reducing emissions from air transport. Similar to CO₂, the decrease in emissions is more modest in the new Member States due to the stronger growth in activity.

SO₂ emissions decrease strongly in the 2005-2010 period, this is in first place the result of the introduction of low(er) sulphur fuels in the road transport sector. In later years the emission levels follow the growing activity levels.

Figure 17 : EU25 total PM emissions for all modes (2000 = 100)

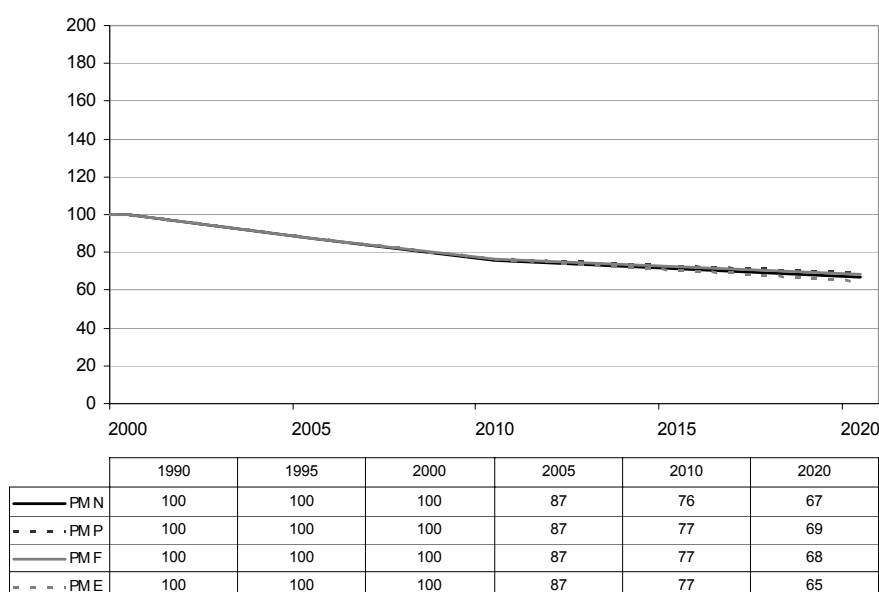


Figure 18 : EU25 total NOx emissions for all modes (2000 = 100)

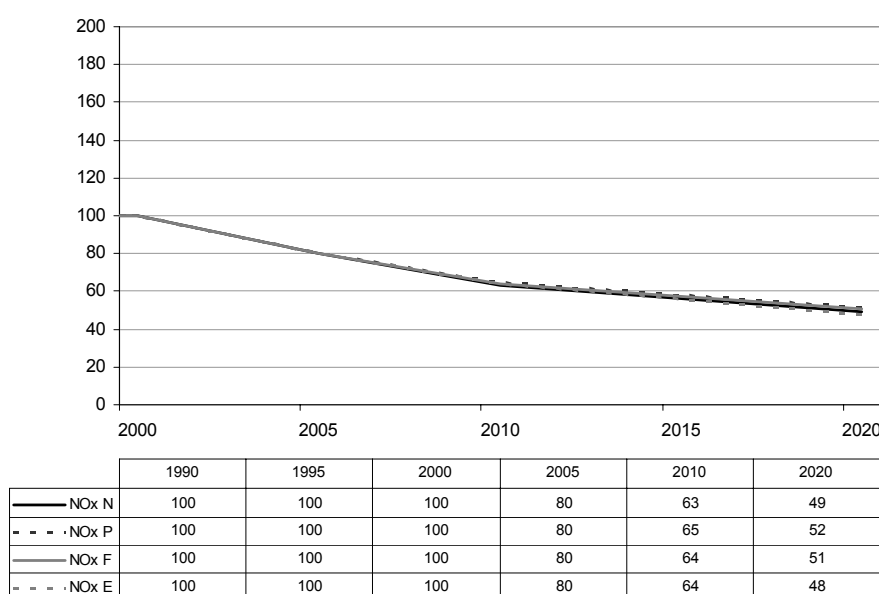
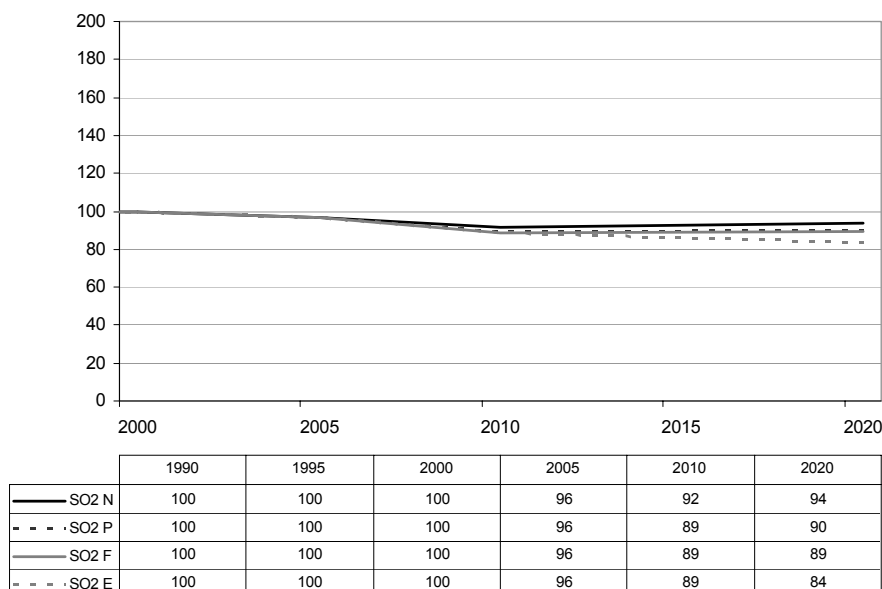


Figure 19 : EU25 total SO₂ emissions for all modes (2000 = 100)



The differences in transport flows between the N and P scenarios are limited, except for the increase in freight rail transport which leads to an increase in freight rail emissions. The main other effects on emissions in the P scenario, compared to N, are a reduction in aircraft emissions resulting from the European Sky Programme and a decrease in bus emissions due to the accelerated introduction of cleaner busses. Overall, none of these effects lead to a significant change in total emissions from the transport sector.

The F scenario is characterised by a lower tonne-km growth and a slightly higher passenger-km growth³⁰ than the N and P scenarios. This results mainly in a decrease in truck emissions and an increase in private transport emissions (car, two-wheelers). The net result, compared to N and P, is a decrease for NO_x and PM. Focussing at rail transport, the dialogue with the rail industry leads to a significant decrease in rail exhaust emissions, notably for NO_x and SO₂ emissions. Note that part of this positive effect will be compensated by increases in electricity consumption and a related increase in lifecycle emissions, i.e. in the emissions from electricity power plants. This latter effect is discussed in more detail in Annex VII to this report. As rail has only a modest share in total transport, the effect of the rail improvements on total transport exhaust emissions is very limited.

III.4.6.4. Comparison of modes

The table below gives an overview of the emissions efficiency per mode. For road vehicles, CO₂ emissions per unit activity follow the trends in energy efficiency. A strong improvement in road passenger transport is expected, mainly resulting from vast improvements in car efficiency. This is a consequence of the voluntary agreement of car producers to reduce test-cycle CO₂ emissions of new cars to 140 gram per kilometre by 2008/9. The increasing dieselisation of the car fleet also contributes to this improvement. Beyond 2009, average car fuel efficiency will further increase as new (hybrid) technologies will gain market share. Also, a further reduction towards 120 gram per kilometre can contribute to this. For the other road modes smaller, but still important improvements in fuel efficiency are predicted. These are driven by the continuous development of technologies to reduce fuel costs of duty vehicles. Busses have the same engines as trucks and therefore also profit from this evolution, at a slower rate because of the older vehicle park. The CO₂ efficiency improvements in passenger rail transport, mainly stem from a further shift from

³⁰ The small increase is due to lower bus and train costs, and lower car travel times.

diesel trains towards electric trains, with a small increase again in 2020 due to the decreasing share of nuclear power.

The major driver for the reduction in NO_x and PM emissions from road transport is the introduction of road vehicles complying to the most recent exhaust emission standards. For busses, the policy promoting an accelerated introduction of clean vehicles of course increases this effect. In the case of cars however, the impact of the new emission standards is to a significant extent hampered by the rising share of diesel cars in the fleet. Road transport SO₂ performance improves as a result of the introduction of low(er) sulphur fuels in this sector.

For rail transport, the improvements in NO_x, PM and SO₂ emissions mainly stem from developments in the electricity generation sector. Future emission reduction efforts in the air and inland ship transport sector are expected to be limited.

Although important improvements in the environmental performance of road vehicles are predicted, rail transport will remain a more environmental friendly mode for passenger transport. The situation in the freight sector is similar. Further efforts to encourage a modal shift from road transport to rail transport thus will lead to environmental benefits. Likewise, a replacement of short distance air transport by (high-speed) rail transport could contribute to environmental improvements. The new truck emission standards will undo the PM and NO_x advantage of inland waterway transport over road transport. Efforts to promote modal shift towards inland waterways thus would be best combined with more stringent regulation on PM and NO_x emissions for inland ships.

The potential environmental benefits of a modal shift from road transport to rail transport should not be overestimated. The modal share of rail transport is only 6% in passenger transport and 13% in freight transport. Even in a very optimistic scenario in which these rail shares would be doubled, this would only lead to a reduction of road transport emissions which is smaller than 10%. The potential effects of technological improvements in the road transport sector are much larger, as can be seen in the table. Furthermore, it should be noted that further modal shift and technological improvements may come at a high cost in comparison with possible measures in non-transport sectors.

Table 23: Emissions per unit activity for EU15 (ton per million passenger-km or tonne-km)

	CO ₂ (g/km)			PM (kg/km)			NO _x (kg/km)			SO ₂ (kg/km)		
	2000	2010	2020	2000	2010	2020	2000	2010	2020	2000	2010	2020
PASSENGERS												
small car	160	135	116	24	22	20	817	287	175	264	206	173
medium/big car	183	155	132	50	35	28	660	365	261	284	214	179
moped + motorcycle	96	89	80	87	87	86	176	219	239	159	137	121
light duty vehicle	254	237	222	145	85	56	1.307	960	727	372	309	286
bus + coach	75	72	72	42	24	14	858	494	280	104	86	84
metro/tram	8	6	7	1	0	0	14	6	4	31	5	2
passenger train	37	34	35	17	13	11	269	208	175	109	41	30
plane	165	164	163	14	14	14	533	524	519	195	193	193
FREIGHT												
light duty vehicle	393	370	349	224	133	88	2.024	1.498	1.143	577	482	450
heavy duty vehicle	121	112	108	68	34	20	983	544	290	167	134	127
freight train	28	27	30	11	10	9	166	153	138	70	30	25
inland ship	37	37	37	44	45	45	638	648	649	80	81	81

Source: TREMOVE

Emissions include both exhaust and well-to-wheel. The years 2010 and 2020 are in the partial scenario case.

IV Challenges

At the time of the presentation of the White Paper on transport on 12 September 2001, the world was changing rapidly. Another major event was the accession of 10 new Member States on 1 May 2004.

But other conditions change too. In 2001, a GDP growth rate of 3% was assumed, and the oil prices were fairly lower than nowadays. Political, economic, technological, and other relevant developments affect the background scenario and therefore the White Paper measures and objectives.

This chapter gives an overview of the challenges that are given by:

- EU enlargement
- security issues
- implementation issues

and other developments of relevance.

IV.1. External developments

Since the transport sector is not only changed by transport policy but also by autonomous changes in the transport sector and its surroundings, the latter will also be taken into account. A specific question in relation to the analysis of the other developments is: Is the political, socio-economic and technological development in line with the conditions when the White Paper was drafted or are major differences observable which could lead to policy modifications or even a re-evaluation of objectives?

Each of the 12 policies of the White Paper were reviewed with regard to relevant external developments. This review is included in annex IV and takes into account the following external developments: changing demography, low GDP growth and pressure on public budgets, disappointing employment growth, increasing transport fuel prices, technological development among others with regard to ICT, reorganization of airport industries and growth of low cost carriers, globalization of passenger and freight transport, external events (SARS, Iraq etc.), changing international relationships and the attention given to safety and security issues. The impact of each external development was estimated and based on this assessment it can be concluded that the most relevant external developments that have emerged after the introduction of the White Paper are

- the low European economic growth and the pressure on public budgets,
- the high instability and increase of fuel prices,
- the continuous globalization and its implication on transport volumes,
- new security requirements in response to the threat of terrorist attacks.

The low European economic growth

Over a longer period the general socio-economic development in Europe led to significant structural changes in the transport sector, e.g. a considerable growth in disposable income and time for leisure, the increasing horizontal and vertical division of labour, and structural changes of the national, European and global economies³¹. These developments have strongly supported growth in road transport and at the same time rely on it as a highly flexible means of transportation. Thus, ProgTrans reports an increasing

³¹ ProgTrans, 2004. European transport report 2004. Passenger and Goods transport in Europe: prospects in the enlarged Europe through the year 2015. Available from <http://www.progtrans.com/>

transport intensity and share of road transport for the past decade which is expected to continue, however at less speed for the period up to 2015.

During the past five years, the growth of GDP and employment was lower than expected in 2001. Three impacts can be distinguished.

- Reduced growth rates in the transport sector, both in the international passenger and freight sector.
- A high competitive pressure on the markets in order to reduce transport prices. This can be seen in the air and road haulage sector where a strong competition forces carriers to reduce prices as much as possible. Realization of social objectives and environmental objectives might become more difficult since private companies are reluctant to invest in such issues and public authorities are reluctant to introduce legislation with enlarged costs.
- Reductions in public and private investments on infrastructure. Member States rather spend their available public funding on national infrastructure projects than on the cross border links. Moreover, it is likely that there will be a stronger preference for new road development and for other measures that reduce congestion. The attention for social and environmental objectives is likely to be tempered. On the other hand, the pressures on public budgets may boost the need for gaining (new) revenues and may therefore positively influence the introduction of effective charging for transport.

Note that a revival of the economy, foreseen in the period 2005-2010, has the reverse impacts on the White Paper objectives. If income levels rise and employment increase, this will lead to additional growth in passenger mobility and freight transport, making it more difficult to reduce the number of bottlenecks at the European network. On the other hand, investments in infrastructure are likely to be higher. Anyhow, the ambitions of a European transport policy in the period 2005-2010 have to take the still fragile recovery of the European economy into account and could focus on contributing to this recovery.

Instability and rise of fuel prices

Since 2001 the fuel prices have been relatively instable. Despite the relatively stability of real fuel prices over the past decades, the last years oil prices have reacted (raised) almost immediately to every major world-wide event which might endanger supply lines, as 9/11, the Iraq war, the Katrina hurricane, several strikes etc. There is increasing evidence that this raise of the oil prices will continue in the coming decades. Partly this increase has to do with the supply of oil versus the increasing demand (China, US) and partly with tax increases due to environmental and climate policies. Although no consensus has been reached on the date when oil production will peak - defined as the point at which half of the total oil known to have existed has been consumed - most analysts concur that this will occur sometime between 2003 and 2020 (Campell, 2000). Given the already evident disparity between increased demand and declining discoveries, crude oil price increases in the future are highly likely, with profound implications for the transport sector and the economy at large. Based on a comprehensive review of elasticity studies, Goodwin, Dargay and Hanly (2004) and Hanly, Dargay and Goodwin (2002) reckon that if the real price of fuel rises by 10% and stays at that level, the long run (roughly 5 years) impacts on travel by passenger car would include a reduction of about 3% in vehicle kilometres travelled and a reduction of over 6% in the volume of fuel consumed. For freight traffic on the road the picture is less clear. Much less work has been done on freight traffic and the empirical evidence on fuel price elasticities is relatively weak. Graham and Glaister (2002) conclude that different elasticities emerge for different commodity groups and trip length classes. Even within these segments wide ranges of values have been found.

If petrol and diesel prices will remain for a longer period of time on a substantially high level it may be expected that fuel and power train technologies of cars will change. This is in conformance with the White Paper policy on clean and efficient vehicles. So called alternative fuels (fuel cells, hydrogen etc) will most likely become technologically feasible and economical and the car park will adapt, thereby reducing the effects of petrol prices. This opinion is becoming more and more mainstream. For instance the oil company Shell (2001) has made long term scenarios on total energy sources and these scenarios assume that a substantial share of future energy supply will come from non fossil sources. This trend helps to achieve the objectives of the EU in the area of sustainable transport.

However, the increases in fuel prices in many Member States in recent years may also endanger some of the objectives of the White Paper. The high prices are putting pressure on carriers and transporters to reduce costs. E.g. the German Federal Agency for Freight Transport (Bundesamt für Güterverkehr, BAG) grades the current market situation in their regular market observation as strained, leading to structural changes and concentration on the freight transport markets. Although this clearly imposes additional incentives for exceeding rest and driving times as well as speed limits, no indication for increasing infringements could be found.

Continuous globalisation

The continuous strong globalisation of trade has already resulted in a sharp increase of imports and exports of both the EU15 and the NMS. Globalisation results to increasing lengths of haul and this may benefit rail and inland waterway shipping. On the other hand, the strong growth of haul and the increasing lengths of haul do also endanger the objective to eliminate bottlenecks on cross-border links and on natural barriers such as the Alps, the Pyrenees and straits.

The opening of the markets has fostered the global interrelation of market activities, especially the linkages with Asian countries such as China are growing. The volume of imports and exports for both the NMS10 and EU15 has increased dramatically over the past decade, with the addition of the new Member States likely to stimulate continued increases in the near future. Between 1995 and 2004 the imports of the EU15 increased by 67% while those of the NMS10 increased by 134%. The corresponding figures for exports are 67% and 144%, respectively.

The growing import and export to other parts of the world does underline the importance of the EU policy on managing the effects of transport globalisation. The assumptions on which this policy is based are of increasing importance. The growing import and export to other parts of the world also underline the importance of the maritime transport sector. Most external trade depends on sea transport and a large part is transported inland by means of river transport and short sea shipping between the large seaports. The further globalisation may therefore stimulate the development of the shipping sector, both inland as well as maritime shipping. According to the European Transport Report 2004³², even the structural change towards a more service oriented economy will not greatly affect this expectation.

An increasing share of high valued goods in international trade is transported by means of container loads, resulting in a strong increase of containerised transport. The growth of container handling in worldwide seaports between 2000 and 2001 alone amounted to 10%. This led to a gain in market shares for inland waterway shipping besides the transport of bulk goods, in particular along the Rhine corridor (Internat. Verkehrswesen 7/2003, p. 359). According to a study by ISL on behalf of HCI (2003), the worldwide con-

³² ProgTrans, 2004. European transport report 2004. Passenger and Goods transport in Europe: prospects in the enlarged Europe through the year 2015. Available from <http://www.progtrans.com/>

tainer handling in seaports will double within the next decade. In the container ships market, the segment with the largest expected growth is ships above 4800 TEUs. Additional gains in sea and inland waterway shipping respectively are expected due to the increased trade between the former and new Member States along the Baltic Sea and on the Danube.

Continuous globalisation has also an impact on passenger transport, particularly with regard to air transport. Increasing business travel is expected but the largest growth may be in the tourism sector. In cross-border passenger mobility tourism and leisure related travel is already dominant with an estimated share of about 75% (Manente, 2000). Continuous growth has important impacts on the TEN investments since data suggests that investments in airports and long-distance rail connections largely serve the rapidly expanding tourism and leisure travel sector.

IV.2. Other EU policies

Other EU policies might either foster or hamper the achievement of the White Paper objectives. Similarly, it is possible that achieving White Paper objectives might foster or hamper achievements in other areas of EU policy, though this is not discussed in this study. The White Paper itself stresses the need for a comprehensive strategy going beyond European transport policy. This comprises transport policy responsibilities on national and regional level as well as the necessity for the integration of European horizontal and sectoral as well as national and regional policies

In this section the issue of sectoral policies integration on the European level is taken into consideration. Thus, the leading questions are:

- Which other EU Policies did have or will have relevant impacts on the development of the transport sector and thus on the achievement of the WP objectives?
- What is the potential impact of the policies implemented on the transport system?

Based on the review of EU legislation and policy documents, the focus of the analysis has been set on some 18 other EU policies which are classified according to the Directorate-General (DG) that is responsible for them. For each of these policies, following a short overview of policy objectives and recent developments in that field, their impact on the transport sector development with respect to the policy areas of the White Paper has been evaluated – we refer the reader to Annex III for more details.

Overall, the review shows a large consistency of other European policies with the White Paper policy objectives – partly the policies of other DGs are also included in the White Paper. The issue of security policy has come into focus of international policy after the terrorist attacks of September 2001 in New York and Washington, of March 2004 in Madrid and of July 2005 in London. Therefore, security aims are not explicitly mentioned in the White Paper. But taking the objectives of reaching a high-quality, safe transport system and recognising the rights of users, the objectives of the European security policy are regarded as complementing the White Paper objectives.

The EU policies that make the most significant contribution to the realisation of the White Paper's objectives are arguably:

- The re-launch of the Lisbon strategy, and more specifically the proposed investments in transport infrastructure on the one hand, and in R&D on the other hand;
- In the case of environmental policy, the policies on air and noise pollution, and the proposed thematic strategy on the urban environment;

- Regional policy can contribute to the financing of the TEN (both through the ERDF and through the Cohesion Fund);
- The research priorities established in the successive framework programmes have very strong transport implications;
- Fiscal measures that aim at fostering the use of alternative fuels and at introducing minimum taxation levels;
- Maintaining the security of energy supplies and stimulating energy efficiency ;
- The maintenance of vibrant rural communities as an objective of the CAP and the move to direct income support.

However, in a small number of policy areas, trade-offs can exist between the White Paper objectives and the policies of other DGs. This can be due either to contradictory policy goals, or to delays in the implementation of policies. Contradictory policy goals are commonly inherent in the relation between the achievement of environmental goals and the promotion of economic and transport development. In this review, trade-offs of this type have been revealed in the cases of:

- improving competition in air transport versus balancing air transport and environment,
- improving competition in air transport and confronting the users with “real” costs,
- respecting the Stability and Growth Pact and investing in infrastructure,
- extending the Trans-European networks and intermodal infrastructures versus the objectives of nature protection and the prevention of noise and air pollution,
- introducing environmental liability and the re-flagging of the merchant fleet,
- maintaining the “Protected Geographical Indication³³” and decoupling transport growth from GDP growth.

The White Paper has acknowledged the necessity for creating a better balance between transport sector development and environmental policy goals namely by the promotion of the development of clean and efficient transport technologies and by including external costs into the prices of transport services.

One has to bear in mind that the time horizon 2000 – 2005 for this assessment is quite short. Therefore, in particular those policy measures that impact the framing socio-economic conditions of transportation, e.g. social policy, come into effect only in the longer term. In most other cases, policy measures tackle a specific issue but do not significantly influence the overall transport development. Examples for these cases are security issues, the improvement of consumer rights with regard to purchasing new cars etc. Lastly, the impacts on those sectors have been rated low where only very few other European policies have been implemented.

IV.3. Enlargement

EU enlargement from 15 to 25 countries has influenced the common transport policy, its objectives and instruments. Of course, it has also an impact as a new challenge on the realisation of the White Paper 2001 policies, since new conditions, barriers and chances have appeared. Economic priorities of post-socialist economies are still connected with transformation processes although this change of economic

³³ According to Regulation 2081/92, “geographical indication” means the name of a region, place or country, used to describe an agricultural product or a foodstuff originating in that region.. As the definition of protected geographical indication (PGI) does not require all stage (production, processing and preparation) to take place in the defined geographical area, the protection offered by PGI could lead to transport to the area, with the only purpose of obtaining the relevant label.

system started about fifteen years ago. Still the economic priorities include stabilisation of the economy. Moreover, the stimulation of macroeconomic growth, technical modernisation of the economy and reduction of unemployment are important in order to prove that the transformation of the economy brings also positive effects in technical and social spheres.

A new element of EU transport policy up to 2010 should be a temporary differentiation of activities directed at structural changes, investment processes in transport infrastructure and regulatory instruments in national transport systems, with respect to the *acquis communautaire*. Until the full economic convergence of the whole EU25 will be achieved, it is difficult to compare transport and logistic indicators for different countries. Also, in the new Member States, ways for achieving the agreed objectives of transport policy up to 2010 can differ from the methods and instruments implemented in EU15.

The process of EU accession fostered the development of new transport strategies in NMS10, including new national transport policies. While these strategies generally emphasise the need to mitigate environmental and health impact of transport and to balance inter-modal splits, the implementation plans of the new Member States are heavily focused on the extension of Trans-European Networks to Central and Eastern Europe, which is favouring building long-distance infrastructure, most notably motorways.

The realisation of White Paper objectives in the enlarged EU is more difficult than in the case of EU15, because of the considerable differences in priorities of transport policy in the new Member States as compared to the objectives of the “old” Member States (and those included in the White Paper of 2001). Technical upgrading and improvement of transport infrastructure is considered a priority in the new Member States, especially in the road sector. Other goals which are considered important are related to the full liberalisation of transport market in EU, again especially for road transport.

The EU enlargement of 2004 and further enlargement make it very difficult in practice to separate economic growth from transport demand growth. In theory, it was expected that in the economy of new Member States the decoupling will be very dynamic, due to high number of tkm per euro GDP (five times higher than in EU15). However, the years 1999-2003 have proven that the expected processes have not been realised (see table below).

Table 24: Relations between inland freight transport and GDP in EU25 in the years 1999-2003

	1999	2000	2001	2002	2003
Rail transport tonne-km					
EU25	357	374	358	354	359
EU15	236	250	241	236	236
NMS10	120	125	117	118	123
Road transport in billion tonne-km					
EU25	1440	1486	1516	1554	1566
EU15	1267	1309	1335	1365	1363
NMS10	173	177	181	189	203
GDP in billion euro, fixed prices of 1995					
EU25	7571	7855	7999	8088	8175
EU15	7298	7571	7708	7790	7865
NMS10	273	284	291	298	310
Tonne-km of rail and road transport per euro GDP					
EU25	0.24	0.24	0.23	0.24	0.24
EU15	0.21	0.21	0.20	0.21	0.20
NMS10	1.07	1.06	1.02	1.03	1.05

Sources: UG, calculated on the base of Eurostat data (as of October 2005) and Energy & Transport in figures 2004.

While in the EU15 countries, the number of tkm per euro GDP has been slightly decreasing (-0.3% annually), the NMS10, after an initial period of decline, show an increasing trend starting in 2002. This is the result from intensified foreign trade and liberalisation of transport markets. In order to strengthen the separation of economic growth from the increasing tendency of transport demand in the EU, the policy

of the EU should also equalise the accessibility and costs of economic factors in the industrial sector. In a condition of huge differences in labour cost and income level between countries, both changes in localisation of production and freight traffic growth can be observed. At present, the localisation savings are higher than possible savings in reduced transport volume and distance.

It should be noted that *shifting the balance between modes of transport* defined as a goal in the White Paper has another implication for the NMS. In those countries the share of railway in the transport market (both freight and passenger) was considerable higher in the past and in the first stage of the transformation process than in Western Europe. However, this situation will most probably not last. During the past ten years, a systematic decrease in railway share has been noticed and the modal split has become more similar to those of the EU15. In the period 1999-2003 the EU15 has succeeded in maintaining a 19% : 81% ratio of modal structure between rail and road transport, while in the new Member States this ratio changed for the worse from 41% : 58% to 38% : 62%. However, a still relatively big share of railways has resulted from railway revitalising instruments and the strengthening of its role will have to be implemented more intensively in the EU15 than in the NMS10.

Nevertheless, *revitalising railways* have recently been considered a big challenge for the transport policy of most of the post-socialist countries. They will have to face urgently problems of inefficient management, excess of employment and low quality of the fleet and infrastructure (and therefore also of the service). The instruments suggested in the White Paper as well as previous rail directives, indicate in which direction railway reforms should be realised. It should be noted though, that some barriers, especially social resistance of railway employees have been a serious obstacle for the implementation. It concerns especially the biggest railway companies, e.g. PKP group in Poland. The instruments already implemented in the NMS will not result in a big increase of rail transport in the total performance, but the existing diminishing trends should be stopped. Moreover, the objective of revitalising railways in the NMS can not be attained by concentrating investments in modernisation of international networks (which are not at present competitive with low costs air carriers). The major problem of the NMS is the revitalisation of regional railways, where the separation of infrastructure and operation of transport services is perceived as a big challenge, and difficult to realize according to organisational and financial obstacles.

The instruments of *social harmonisation* within the policy of improving quality in the road transport sector have been gradually implemented in the NMS, in spite of high barriers combined with lack of acceptance of new solutions among transport enterprises as well as difficulties with monitoring and controlling legal regulations. In the next years the implementation processes will be continued, but it should not be expected that it will bring about a very significant impact on shifting the balance between modes of transport in the NMS. Moreover, the improving quality of road transport in the new Member States will cause an increase in the demand for road transport services and result in a bigger role of the road sector in logistic systems.

In the NMS, *air traffic* has grown very dynamically. Because congestion in the air and on the ground is less of a problem in the NMS as it is the case of many countries in Western Europe, measures that are aimed at the improvement of infrastructure and capacities has not been a key objective of transport policy. However, it can be expected that the implementation of measures to adapt to the new circumstances will be in most instances unproblematic. Other measures, which also have some acceptance problems on the European level, e.g. the harmonization of airport charges and the introduction of differentiated en route air navigation charges will probably not be implemented in the near future. From the point of view of the NMS, focus of the transport policy will be laid on the development of air transport. On average, an EU15 citizen travels more than once per year by air, while in the NMS it is only one flight per 5-10 citizens an-

nally. It can be expected that this gap will narrow in the next few years, also because of the strong presence of low cost carriers in the NMS.

In the context of enlargement, the promotion of *sea transport* (especially short sea shipping) in the NMS to a higher degree is a necessity. It will also be necessary to promote integrated links including several corridors. In order to reduce the physical distance between the Iberian Peninsula and Eastern countries, for example, it is a need to promote stronger links between the Mediterranean Sea and the Baltic Sea. In the transport policies of the NMS, inland waterways are not considered to be an alternative for road transport. Financial resources of the ERDF and the Cohesion Fund are currently not used for investments in this mode of transport.

In practice, the former EU policy regarding *intermodal transport* has boiled down to regulating start and end operations of road transport in relation with railway and sea terminals. In the meantime, the poor quality of railway services seems to be one of the most important reasons for the stagnation of intermodal transport development. Improving and extending the Marco Polo program, including the modernisation of railways, will be necessary. It seems to be very important to take into consideration the enlarged EU transport system.

The objective concerning ***eliminating bottlenecks*** in the NMS is related to the aforementioned infrastructural needs, especially in the road transport sector. It should be stressed that the problem of congestion is less serious in the new Member States than in EU15 particularly when the average density of infrastructure and its quality is taken into consideration. The dynamism of road traffic growth in the NMS10 in the years 1995-2003 had been significantly higher (6-7% per year) than in the EU15 (4-5% per year). Taking this into account as well as the relatively lower capacity of the road network in Central and Eastern European countries, it could be expected that, near 2020, most of the major roads ('E' class) will achieve an annual average daily traffic of ca. 25 thousand and more, which would result in drastic congestion problems. Consequently, the European Union needs to support road network development, because the partially modernised railway sections will not serve as an alternative for roads. Moreover, research on new innovative traffic management technologies have to be intensified.

The continuation of *financial support for TEN* realisation is indispensable in the enlarged EU. Infrastructure improvements are also considered to be a high priority in the national transport policies of the NMS. The experiences of recent years prove that it is possible to involve non public capital to infrastructure financing, also in the NMS, although here the shortage of resources is the biggest challenge. It has to be noted that infrastructure needs of the NMS not only apply to international networks, but also to national, regional and local connections. At present, new Member States rely on the Cohesion Fund, ERDF, and TEN-T Budget Line.

The *reduction of environmental consequences* (both global and local) of transport activities and future sustainable development in transport sector is a big challenge for the enlarged EU. In the NMS the objectives are not clearly understood. Transport liberalisation, particularly for the road transport sector, high rate of increase in road carriages for both passenger and freight and the confirmation of the role of road transport on the market result in limited government activities in the field of external costs internalisation. It should also be noted that there is a lack of social acceptability for introducing restrictions regarding road transport market development. This is caused by the perception of road transport as the factor which stimulates economic growth, employment, etc. This does not mean that road transport operators do not adjust their activities to, for instance, social regulations. The majority of regulations in this area have been implemented in the NMS. However, one should not conclude that the NMS are not interested in reducing the ecological burdens of road transport activities. On the contrary, the authorities and citizens of those

countries are aware of the negative consequences of excessive road sector development, but the solution they are looking for are not situated in limiting traffic but in introducing clean vehicles and fuels (higher significance of the emission standards EURO-III, EURO-IV, and very shortly EURO-V).

The objective *placing users at the heart of transport policy* in the light of enlargement means friendlier and higher quality transport services, also in the NMS10, although it is not a high priority in their transport policies. It has to be stressed that the improvement of road safety and the reduction of road accidents are a big challenge for the NMS10. Especially when lower technical standards for vehicles and the condition of transport infrastructure, including the lack of a high quality motorway network, are taken into consideration. Moreover, considering the relatively high potential of public transport as a post-socialist heritage and drastic decline of public bus and railway services, it is important to support solutions in the sphere of passenger intermodality (e.g. railway service at the airports in international network or bus-railway connections in regional traffic).

In the light of enlargement, reforming charging systems or technological development, will be even more difficult. These objectives meet financial and fiscal barriers which are difficult to overcome in this stage of transformation from socialist to market economy. Scepticism about the implementation of infrastructure charging system in the NMS arises in combination with delays in reforming public finances. Moreover, there is the risk of loosing additional financial sources for subsidies to inefficient sectors of the economy. Most of all, there is the lack of good experiences with successful reforms of transport charging in the new Member States. So, even if in the transport policies of the NMS the slogan on adopting effective charging has appeared, it is not met with any practical implementation activities. But also the implementation on the EU level has not been completed. From the new Member States point of view, this objective should not be treated as a high priority at present. Rather, further research is needed to include the specific economic and transport situation of the NMS. Moreover, the realisation of the reforms should be verified with the revision of the Lisbon strategy of 2005. Lower emphasis should be put on reducing ecological burdens and a higher emphasis on the stimulation of economic growth and creating new workplaces. But it should be stressed that further EU activities in the area of reforming transport charges and good examples of practical implementation in specific countries would change the policy direction also in the NMS10.

The implementation of EU solutions in the area of improving *road safety* is meeting difficulties in the NMS. But it should be noted that national programs implemented in the past produce desired results at present. The improvement of road safety is included as an objective in transport policies, but both the genesis and the instruments used differ in comparison to EU15 activities. The high level of accidents is very closely connected with the condition of infrastructure and the quality of the transport fleet. The improvement of both has had a positive influence on the reduction of accidents risk in recent years. Programs implemented in the past in the new Member States were based on individual solutions, which had nothing in common with the EU proposals. Summarising, the policy in the near future should be directed at:

1. eliminating old vehicles,
2. improvement of transport infrastructure (modernisation, new investments, introducing ITS instruments, etc).

For the objective recognising the *rights and obligations of users*, in the NMS, mainly the instruments related to public service requirements have been implemented. In the case of compensations for air passengers there are no formal or procedural obstacles to implement new regulations. However, problems are expected with the compensations for rail passengers, taking into consideration the organisational and financial situation of the railway enterprises in the NMS.

Developing *high-quality urban transport* is perceived as a high priority in most national policies and local programmes. The congestion problems of big cities concern also the NMS, especially for the capitals and metropolises. The reorganisation of public services, realised during the transformation period, has produced positive effects, but still the quality of services leaves a lot to be desired. In new Member States, the specific activities of local authorities, including new investments, supported by organisational and regulation changes, are needed. The good practice promoted by the UITP is helpful in this case. The measures suggested in the White Paper are not sufficient.

Putting research and technology at the service of clean, efficient transport is a big challenge for the enlarged EU transport. Strong financial, technological and organisational barriers appear in the new Member States. The EU activities in this field are needed but it is not probable that the NMS will participate in the programs actively, and that the objectives will be realised effectively and quickly.

It seems that more weight should be given to objectives concerning economic instruments transport policy measures, especially in a **globalisation** context. In the range of the NMS, this means improvement of transport infrastructure should be encouraged, not only in the centre of the continent and on transit routes, but also on peripheral connections and regional networks. There is also a need for technological updates and investments in the areas where individual activities of the NMS can not produce desired effects due to the lack of financial resources or organisational skills. The development of GALILEO, further and stronger support for the development of intermodal transport are good examples of these EU activities.

The new Member States neighbouring with the big area of the Commonwealth of Independent States can not be restricted to bilateral agreements concerning trans-border transport investment programs. Moreover, they expect that the EU will have a single voice in the relations concerning transport sector with external countries, e.g. Russia.

IV.4. Security

After the terrorist attacks in the USA, Spain, Turkey and other countries and the Gulf war, security issues are high on the international political agenda. This has lead to a shift of focus in international relations and a shift of alliances between countries. International organizations, also in the area of transport, have shifted their efforts on managing the newly required security issues. This does not hamper the objective of the White Paper to increase the EU presence in Global forums. It might even strengthen the role of supranational bodies like the EU since the importance of supranational co-ordination has grown..

Terrorist attacks has immediate impact on air travel. The heightened security standards on the one hand made flying more secure, but on the other hand generated higher costs, increased total travel times, complicated operating procedures and finally caused a lot of inconveniences for passengers. There has been a shift in focus from rights towards obligations of users due to the increasing requirements in the area of security. This trend is likely to continue in the coming years. It is however not yet clear whether or not security obligations do hamper or stimulate the White Paper policy on recognizing the rights and obligations of users in the area of transport. In most cases, there are no relationships.

Also water transport is strongly affected by the new security requirements, for instance by the Container Security Initiative (CSI) introduced by the United States. The aim is to install safety locks and electronic tag-transport-systems on overseas containers in order to enable a full monitoring of the handling and de-

tection of potential violations. The additional time and cost that are imposed could have a negative impact on maritime transport in general.

IV.4.1. Achievement of White Paper objectives on transport security

The White Paper on European transport policy was published September 12th 2001. It did refer to safety as an important policy issue for traffic. Safety measures are aimed at the prevention and mitigation of unintentional acts and minimisation of the consequences. However, the White Paper did not address security. Security measures relate to the prevention, repression, and mitigation of intentional acts to harm people, to destroy or steal assets and to disturb the economic, social and environmental well being of citizens. This definition includes vandalism, crime, and terrorism.

Security is a challenge: aircraft have been used as weapons (9.11), public transport services are very vulnerable targets (Madrid and London), and ships can be used to smuggle arms. Terrorism may cause sudden drops in transport demand. Nowadays security is a basic element in the definition of quality transport services, however, a balance is required between operational needs and security requirements.

Today, Community policy on transport security relates to civil aviation, maritime transport, critical infrastructure, land passenger transport, the supply chain, transport of dangerous goods and energy facilities and infrastructures. DG TREN is the leading Directorate-General of the Commission for these topics. In addition, DG Enterprise is responsible for the main research and development projects. Coordination between both DGs synchronises the R&D on transport security.

IV.4.2. Issues of an European transport security policy

IV.4.2.1. Security is a generic quality issue

Security has become as much an element in quality of service as safety or management methods. Security in transport is thus an essential addition to the White Paper. As security policy always centres on 1) political prevention (by international cooperation and coordination), 2) intelligence to track terrorism and 3) protection, Community policy needs to be coordinated along the Directorate-Generates involved. To this purpose, an overall European transport policy should consider all objectives and all interests in an integrative manner. Consequently, it can give the other White Paper's objectives the opportunity to realise their goal.

IV.4.2.2. Security awareness culture

The European Union should create a security awareness culture. All European citizen need to be aware of the threats they are encountering. Travellers need to be properly instructed by the Community on what circumstances are too unusual and how an individual should react to it. Security instructions may save lives, just like the safety instructions can in civil aviation. In addition, citizen can assist security surveillance in this manner by reporting suspicious behaviour.

IV.4.2.3. Liberty paradox

The European Union has always striven for satisfactory citizens' liberties and rights. While combating terrorism, some privacy issues may come into discussion. The European Union should perform a profound debate on the privacy issues of security issues. Further, in addition to the security awareness culture men-

tioned above, the European Union should create and prove the security culture in which the common sense is that ‘Big brother is not watching you, but he is looking after you’.

IV.4.2.4. Company responsibility versus governmental responsibility

The (supranational) government can not take all necessary security measures by itself. Many measures must be taken by companies involved. European Union either can regulate security measures to be taken by companies or can initiate voluntary programmes. Policy makers need to enter a debate on whether such security measures need to be promoted through voluntary programmes or via regulation. Regulation may create a more balanced level-playing field, because all relevant parties in one market are treated in the same manner.

IV.4.2.5. Fair distribution of costs and benefits

A fair distribution of costs and benefits and – as a consequence – a fair competition is one of the fundamentals of Community policy. Security measures may affect multiple organisations in the supply chain. Policy on transport security should realise that an organisation that needs to implement security measures, may not be the same as the supply chain party that benefits from the security measures. For instance, voluntary programmes may have the disadvantage that costs and benefits of security measures are not distributed to supply chain parties in a fair manner.

IV.4.3. Recommendations on transport security

IV.4.3.1. Towards common goals on secure traffic

Securing traffic consists of the resistance to misuse and sabotage to harm traffic networks in general and create casualties and (economic) damage in particular. Transport security policy for traffic should at least pay attention to the following issues:

1. Resistance to misuse and sabotage of transport infrastructure, storage of dangerous materials near crowded areas (like fuel near airports) transport vehicles and traffic management systems.
2. Deployment of the European satellite programme Galileo for security requirements. The White Paper on European transport policy already suggested this issue.
3. Upgrading to traffic management systems (e.g. with cameras, real-time threat analysis and detection tools) to detect reconnaissance, preparations and execution of (terrorist) attacks;
4. Training personnel that uses traffic management systems in security awareness, detection skills, and intervention possibilities;
5. Training logistics personnel and regulating traffic planning where necessary to prevent dangerous goods being transported near very crowded areas in general and during rush hours in particular;
6. Assurance that essential links in the transport network remain accessible in case of any kind of network failure;
7. Resistance to access to public transport services and crowded areas by possible terrorists carrying suspicious items that are potential means for attack;
8. Assurance that situation information is quickly accessible by the appropriate authorities to react to any (terrorist) event.

IV.4.3.2. Towards common goals on security in freight transport

Trustworthiness should ensure that organisations responsible for traffic and/or transport are reliable in their actions. This includes both prevention of fraud and misbehaviour of the organisation's own employees and resistance to misuse and sabotage of the organisation's activities and information by others.

Exemplary measures to ensure trustworthiness in transport (and traffic where appropriate) are:

1. Screening of employees, tracking of employees, and ensuring the incorruptibility of dedicated security personnel by proper conditions of employment and salaries;
2. Security management procedures, including shippers (e.g. security officer responsible for secure loading and unloading of containers and trucks);
3. Security certification to prove that a company can be trusted;
4. Security procedures and certification to prove that an authority issuing documents of title is a trustworthy party and that the documents can be trusted;
5. Secure (logistics) information exchange to prevent unauthorised copy and distribution of sensitive information, theft, and misuse of transport processes.
6. Verification of logistics documentation through parallel information exchange;
7. Supply chain security measures along the supply chain to protect the integrity of the door-to-door transport process. This includes road haulage but also intermodal transport chains, such as inland waterways transport, rail transport, short sea shipping, pipeline, inland terminals, and access and egress transport by road.
8. Threat analysis of procured goods and resources (incl. transport vehicles) and only collaboration (i.e. trade) with trusted parties;
9. Threat analysis of self-manufactured goods or self-provided services in terms of different purposes of usage by customers and third parties, and only collaboration (i.e. trade) with trusted parties where necessary;
10. Full container scanning in sea ports and air ports integrated in the logistics system of a terminal.

IV.4.3.3. Transport security research

Transport security research may focus on the following exemplary topics:

1. Research and development (R&D) on threats of terrorism and criminality. This includes risk analysis (e.g. character travellers, child trafficking), setting vulnerability priorities, and assessing the effects of possible counteractions;
2. R&D of real-time surveillance and intervention techniques to protect crowded areas;
3. R&D on decision making in surveillance and intervention to protect crowded areas (including strategies, procedures and training programmes);
4. R&D on tracking and tracing of traffic for end to end control of vehicle movement (incl. license plate recognition, identification and verification with black list, car tracking and car interception);
5. R&D on travel and logistics information scanning and processing techniques;
6. Programme to study secure methods to integrate security efficiently into the logistics transport process;
7. Training and knowledge exchange programmes of security guards.

Some projects have already been launched such as the COUNTERACT project³⁴ which aims to assess and recommend feasible and cost-effective solutions for the improvement of security in transport and energy.

³⁴ Cluster Of User Networks in Transport and Energy Relating to anti-terrorist ACTivities

IV.5. Political barriers to implementation

This chapter focuses on the political barriers to implement the White Paper measures. A more elaborate analysis can be found in Annex XX.

IV.5.1. *Political dimension: institutional problems*

Subsidiarity is the European Union's guiding principle in realising the objectives set out in the White Paper. Therefore, partnerships between the European Union's institutions and the Member States are necessary at all levels, that is not only at the highest political and official level, but also among operators, users, investors and environmental organisations.

Many of the problems encountered in implementing the European Common Transport Policy relate to the variation in regulatory and administrative environment in the field of transport across Member States.

Differences arise in the fields of:

- Distribution of administrative responsibility and competencies. In most countries, the responsibility for drawing out and co-ordinating transport policy at national level rests with a single ministry. However, increasingly, due to the development of cross-sectoral policies, a greater number of different administrative actors come to play a role: the ministry responsible for environmental affairs and/or public works or spatial planning and, due to the heavy involvement of public funds in transport investments, ministry responsible for finance.
- Degree of "planning culture" of transport policy. The European Common Transport Policy, especially with respect to harmonisation, has had the greatest impact in those countries with poor 'planning culture', where it has provided a lever for upgrading and/or structuring national transport policy, helping to level conflicts and speed-up decision-making procedures.
- Decision-making structure. This is related to two issues: the control of the decision making process (centralised by the national government or decentralized to regions, etc.) and the degree of intervention of the state in the operation of the transport market (from state controlled to free-market). The situation is different among Member States and, in the last years, processes of institutional decentralization and fiscal federalism are taking place in most of these.

With respect to the different competences, the rise of a new supra-national European level might collide with the demand of regional and local governments for more participation in decision-making. Disagreements still exist regarding the extent of harmonisation, specifically concerning issues and areas which are legitimately to be dealt with at the European level. Examples include the common environmental threshold levels, safety regulations, or negotiation mandates with third countries.

The following table shows the possible conflict situations of the policies. The policies which are more likely to generate political conflicts, are the ones grouped in action priority 1 "Shifting the balance between modes". First of all, this could be explained by the fact that sometimes the EU goal to reduce road traffic in favour of more sustainable transport modes is not a Member States national priority. For some countries, road transport still remains the most utilized and functional transport mode, and the national transport documents still stresses this concern.

Other kinds of conflicts could rise, concerning this action priority, between different levels of government, and this is especially true when the expected impact of a transport policy is twofold: develop the

transport system and regenerate the area in which the policy is implemented. So, policies as “Improving quality in the road transport sector”, “Controlling the growth in air transport”, “Promoting transport by sea and inland waterway” and “Turning intermodality into reality”, which include a development of the local infrastructure, could lead to a sort of competition between regional/local authorities (specially in a context of top-down earmarked finance). Furthermore, conflicts could rise between different ministries: as example the policy of “Controlling the growth in air transport” usually involves transport and environmental ministers, which could have different priorities and objectives concerning these themes. As regards the TEN-T policy, the evidence shows that an unclear policy articulation at the EU level could lead to an incorrectly and imprecise interpretation of the policy objects at a lower level. Conflicts are likely to rise also concerning the charging policy, since among the Member States still prevail different orientations concerning both the charge levels and the revenues use.

Table 25: Potential institutional conflicts of the 12 White Paper policies at national level

Action priority	Policies	Conflict Level
Shifting the balance between modes	1 Improving quality in the road transport sector	***
	2 Revitalizing the railways	***
	3 Controlling the growth in air transport	***
	4 Promoting transport by sea and inland waterway	***
	5 Turning intermodality into reality	**
Eliminating bottlenecks	6 Building the Trans-European transport network	**
Placing users at the heart of transport policy	7 Improving road safety	**
	8 Effective charging for transport	***
	9 Recognizing the rights and obligations of users	*
	10 Developing high-quality urban transport	*
	11 Putting research and technology at the service of clean, efficient transport	*
Managing the globalization of transport	12 Managing the effects of globalisation	*

Code: ** High level of conflict
 ** Medium level of conflict
 * Low level of conflict

IV.5.2. Socio-economic groups conflicts

The Common Transport Policy of the European Union and the objectives outlined in the White Paper have diverse effects on different stakeholder groups. As society is no homogeneous entity, it is an enormous challenge for politics to cope with the different, and very often conflicting, views and objectives that different groups in society have. Furthermore, policy makers have “hidden agendas”, like short-term election objectives etc. Additionally, on the European level, different cultures, languages, social backgrounds, legal systems and levels of prosperity have to be taken into account when political strategies are to be developed and implemented.

The Commission has to withstand lobby groups that are massively trying to safeguard their vested interests. However, if interpreted in the right way, and provided that a balance of opinions is taken into account, this kind of stakeholder participation can provide important insights from the affected groups. In many cases, the EU has a greater scope of action than national governments in liberalising (or efficiently regulating) markets, because of its less direct relation to lobby groups. In this regard, the distance of EU institutions, which is usually seen as a disadvantage, when it comes to interaction with the public, is an asset, when it makes EU institutions potentially less directly exposed to lobbying and reduces the risk of “capture”. The past has shown that in this sense the EU has attempted to use its powers extensively, but many lobby groups were successfully resisting, every time these have been supported by their national governments. A closer look is given to three groups of White Paper measures.

1. Measures aimed at opening/efficiently regulating transport markets. Although these measures are aimed to enhance overall economic efficiency, they provoke resistance by incumbent companies, their industry federations and trade unions alike, often with active protection by the states involved. Reason for this behaviour is the fear to loose economic rents and short-term political consent. As these profits are owed to the institutional pattern how the market is organised, the affected social groups try to influence policymakers and regulators to uphold the status that is connected with certain benefits for them. According to the Public Choice Theory, this phenomenon is called “regulatory capture”, often based on “information asymmetries” and “vote exchanging”, and does not only lead to higher prices for consumers, but also affects innovation adversely, as creative new entrants face market entry barriers or even denial to access the market. Vice versa, lobbying, even if far weaker, is exerted from the potential winners of such measures, in this example interested new entrants. However, due to different economic power, relations, structure, etc. the pressures from the different groups are not proportional, neither to the issues at stake nor to the potential overall benefit. Therefore, a neutral position is not the simple sum of all forces in action, but needs discernment of the arguments presented, and a clear understanding of the efficiency and distributive content of every single policy.
2. Measures aimed at harmonising social standards. These measures will be hailed by workers' federations and trade unions, particularly in the Member States where wages are relatively high. These groups fear that competitive pressure, particularly from the new Member States will lead to a reduction in their own wages or to a loss of jobs. Although in terms of income distribution, more open markets without harmonization will lead to advantages to lower-paid workers.
3. Measures aimed at harmonising the competitive situation. These measures are of special importance for entrepreneurs from different Member States that compete on the Common Market. Competitive distortions, based for instance on differences in taxation, have had severe impacts on the ability to conduct business for many companies. Nevertheless, pressures in favour of setting “level fields” in advance, often disguise mere enduring protection for the incumbents.

The general conflict ‘environment vs. economic development’ sees very special social groups involved, i.e. present economic interests put against future generations welfare. This conflict deals on the one hand on policies concerned with reducing the negative impacts of traffic for the environment and society, and even with reducing transport volume per se, and on the other hand policies to improve transport flows in order to further enhance economic development and market competition. Such a conflict cuts vertically across all dimensions and/or levels of political decision-making or action, covering environment-related concerns, such as noise abatement, air pollution, safety, pricing of external costs, the extension of transport infrastructure, etc., and global competition issues (specially toward less social minded context, like Asia, and for the environment, the same U.S.A.).

With respect to the new Member States, the analysis has not taken into account the role of political decision-making. The level of social group conflicts in these countries has been assessed taking into considerations following factors: the organization of activity at national level, the membership in international organizations and associations, the employment in given transport sectors, the imbalance of living standard in a given country in relation to the EU15 average and the social repercussions (acceptance or objections) of protest activities or strikes in different transport sectors. It can be stated that the most important social groups conflicts exist on road market both urban and interurban. Especially in Poland, Hungary and Czech Republic significant social conflicts can be observed. In the Baltic States and Slovak Republic intensity of conflicts is lower while in Slovenia the indicator is very low – 75% lower than in Poland. On the contrary in water transport sector level of conflicts is almost insignificant. The highest indicator is represented by Poland, following Hungary, the lowest one belongs to Czech Republic. Rail and air sector can

be assessed as intermediately taking into account the level of their relevant factors. Similarly to road sector in Poland, Czech Republic and Hungary an intensity of conflicts is the highest, while in Estonia and Slovenia almost insignificant.

IV.5.3. Relevant examples of political conflicts

The Public Choice Theory assumes that the public decision makers tend to develop consistent and rational “egoistic” objectives, as it postulates the capability of vested interest (“rent seekers”) of “capturing” the elected decision makers. In turn, the main instruments of this “capture” are “information rents” and “exchange of votes”. The European transport policy shows a wide range of practical fields where this approach can offer important insights: its main failures or delays can well be linked to the protection of special interests against the more general ones.

- Liberalization/efficient regulation difficulties for public subsidized sectors. The process of opening up some form of market competition in the rail and local public transport seems much more slow and difficult than in profit-making (or at least non-subsidized) sectors, like airline services or highway and airport concessions. The “standard” explanation of lack of private operators’ interest in entering loss-making activities is absolutely not convincing. In fact, the inefficiencies are often so large, than opening a real (unrigged) competitive bidding for the present services with the present subsidies will generate a rush of competing new entrants. According to a “capture” explanation, any firm appointed within a competitive process cannot guarantee favourable electoral impacts, or jobs appointed with political criteria, or the choice of suppliers in political-sensitive regions etc.
- Investments in low priority infrastructures. Several projects with limited traffic perspectives and negative rentability absorb a large share of limited public resources. This attitude may obviously be related with traditional consensus building practices. “Standard” Keynesian arguments scarcely hold: the impact of infrastructure building is limited both for its low “multiplier effect” and for the considerable lag that civil works (specially large ones) present between the initial decision and the actual building activity, with the obvious risk, compared to other forms of Keynesian incentives, of taking place in the following growth economic cycle.
- “National champions”: “prisoner’s dilemma” or “capture”? The “hidden agenda” that explain a large part of the resistance to opening up the market in many transport activities can be related to the defence of large national firms. The standard explanation can be a “prisoner’s dilemma” case: I am not liberalizing first, since I do not know if other countries will follow suite, and therefore my “champion” can be severely damaged. In this context, “capture” seems by far a better explanation: the users are a very general and nondescript body, while the interest involved in the large national firms are vocal and able to influence the short-term consensus mechanism in several forms.
- Resistance against “efficient pricing”. The contradiction between the European acceptance of the Kyoto Treaty and the widespread resistance in implementing consistent measures in order to achieve its objectives can be explained considering that in this case the “capture” phenomena are more evident and transparent. In fact the pressure of global competition tends to put all the economies with stiff environmental standards at an evident disadvantage. Short- term consensus and employment considerations prevail over a picture of a long term clean and sustainable environment. But, if the present level of oil price will last, the environmental picture and perspectives will change for the better anyway: alternative clean energy sources will rapidly become available due to the fact that their production costs become competitive.
- The inefficient regulation of infrastructure concessions. Infrastructure concessions, both when the concessionaires are public agencies and when they are private operators, are in general weakly regulated and this in turn generates also low efficiency and innovation capability from the under-incentivated concessionaires. “Information asymmetry” is the key to treat this as a “capture” phenomenon: short-

range electoral (i.e. “egoistic”) objectives can be disguised by the above mentioned practices, while longer range efficiency goals will suffer from misallocated public resources. But this can be hardly perceived by the general public.

An in-depth specific case study is considered in order to illustrate the relevance of the public acceptability of White Paper policies, as these tend to affect people’s daily life to some greater or lesser extent. Indeed, a failure to take on board the user perspective can, by itself, lead to resistance even where a policy would lead to overall societal benefits; and that such resistance – and the behaviour it triggers - could endanger the success of the policy.

- Heavy goods vehicle charges. Road pricing is generally shown in research as the area most subject to acceptability concerns. The key proposal of the White Paper relating to infrastructure charging was to bring forward a framework directive setting out the principles and structure of an infrastructure-charging system and a common methodology for setting charging levels, offset by the removal of existing taxes. Progress in all of these important measures has been problematic and, in the absence of a common charging framework applicable to all modes being developed, focus has turned to roads (the Eurovignette directive). The opposition to this proposal centres on a number of concerns, particularly regarding the impact of full internalization on competitiveness and the environmental impact of new transport infrastructure. Designing a package of measures which will meet these concerns is clearly not easy, as it would involve gaining the trust of stakeholders that revenue would be used in a way which removed any threat from the higher charges to competitiveness, and some form of compensation for peripheral states.

IV.5.4. Recommendations

- a) Compensate the losers. It is important to identify the relevant stakeholder groups relating to any policy measure, understand their concerns and – if necessary to get the measure through – develop measures to ‘buy-off’ the opposition, taking into account the distributive effects. The ‘carrot and stick’ approach, i.e. incentives to Member States and local administrations which are more active in making their transport systems more efficient, might be of great help in this context.
- b) Liberalise and/or regulate case by case, and privatise with extreme prudence. The experience in Britain shows that it is easy to do these things in a way that is counter productive: bus deregulation led to poorer services (in some respects at least), higher fares, fewer jobs, lower wages and poorer working conditions (though admittedly much less subsidy). Competitive tendering is likely to work as a way of introducing competition (‘for the market’ rather than ‘in the market’), and can be applied in a wide range of cases where full competition looks not efficient or risky.
- c) Recommend independent national regulation Authorities, able to protect the users and to incentive efficiency, avoiding as far as possible the widespread present “capture” mechanisms. A similar approach can be recommended also for infrastructure investments: the evaluation process has to be performed by independent subjects, via a tendering procedure, and with transparent and publicly debated results (see the World Bank approach).
- d) Regulate transport infrastructures more effectively. The aim here is to protect the users, both firms and travellers, from monopolistic rents in case of private concessionaires, and from inefficiencies in case of public ones. Special care has to be taken on investments of concessionaires: here direct and attentive public intervention and control seems necessary, given the high risks both of under- and over-investment (“gold plating”) experienced in several cases, also outside the transport sector.
- e) Make the ‘national champions’ problem more explicit, avoiding that the national pressures remain “behind the scenes”. A possible tool is promoting or requiring specific analysis of the national and European costs and benefits (as well as distributive impacts) of reforming actions that may change the role of large national companies.

- f) Make explicit the social trade-offs between the protection of the transport demand and the protection of transport supply (workers, firms, etc.), highlighting that in a context of limited public resources, higher supply cost implies either less social services or higher tariffs (i.e. the “social opportunity cost of public funds”).
- g) Analyse the anti-cyclical and the employment effects of large infrastructures investments, further than reinforcing the “traditional” cost-benefit analysis, given the fact that these arguments are frequently raised in order to justify low-priority investments, and large doubts exists on the validity of these arguments (civil works have now both a limited occupation multiplier and delayed economic impact).
- h) Recommend the avoidance, as much as possible, of top-down ear-marked finance (“derived finance”). This mechanism renders the local and sectoral decision-makers financially irresponsible, incentivating the maximization of the costs (both for investment and operations). At least part of the financing has to be allocated as a lump-sum to the decision makers, setting in motion the perception of the social opportunity cost of public resources.

IV.6. Infrastructure investment

The majority of the White Paper’s investment proposals were bound up with the development of the Trans-European Transport Network, in particular the so called ‘Priority Projects’ comprising the core of that network. The Commission has been very active in this area and, notably, has overseen two updates of the guidelines for developing the TEN-T and three reviews of the set of priority projects in the period since the White Paper. What has emerged is a massive investment programme spanning the period up to 2020 and proposals for significant EU funding contributions towards the cost of this programme. Substantial sums of money have been invested in the priority projects over the past decade but the rate of progress with the investments in the TEN-T priority projects continually falls short of aspirations

In establishing an investment programme capable of being effectively implemented it is crucial to have a decision-making process that allows decision-makers to agree on the set of projects that are most worthwhile, fundable and, otherwise, achievable. For this, some form of appraisal framework is required, comprising a technical method and a decision-making framework within which that technical method is going to be used.

It was clear from the outset that the TEN-T was going to involve cutting-edge appraisal issues and, hence, that it was likely that some difficulties would be encountered in relation to technical appraisal. Firstly, their multi-national aspect called for some agreement and clarity regarding where prime decision-making and implementation responsibilities lay – with the Member States or with the EU. Secondly, their multi-modal, multi-dimensional and multi-agency nature called for an appraisal framework that could take these aspects on board – something that certainly did not exist in the mid-1990s. Thirdly, there was clearly a keen interest in what was referred to above as the ‘wider’ impacts of the projects – impacts related to the Internal Market such as employment impacts and the accessibility of different regions of the EU; impacts that the state of the art in appraisal lagged behind on. It is also important to acknowledge that the state of the art in respect of the assessment of infrastructure programmes is less well-developed than that for individual projects. In the context of a major programme of investment such as the TEN-T, this creates the potential for difficulties, perhaps giving rise to the possibility of conflicts emerging between achieving the overall objectives of the programme and how any particular project impacts at the local level, without there being a clear technical means of resolution.

Notwithstanding these conceptual difficulties, it also has to be acknowledged that there are significant practical problems in collecting the data required to input into the appraisal process - this applies both to

the collection of relevant statistics and to technical and behavioural parameters – and in applying models at the appropriate scale and level of accuracy.

As well as the technical challenges associated with establishing a clear and robust decision-making process, there are, in a Europe of 25 Member States and several levels of government, significant and wholly legitimate political factors impacting on the decision-making framework. The TEN-T decision-making process is inherently bound up with politics and, ultimately, politicians are responsible for making the decisions, so clearly political preferences will have an important role to play. However, we would argue that – where-ever possible – these preferences should be informed by and integrated with sound technical appraisal; even where a political decision is made to do something that is at odds with the findings of the technical appraisal. Furthermore, it should be clear what aspects of the project are being judged on the basis of technical assessment and what aspects are being judged on the basis of political preferences, not least so as to avoid any illegitimate double-counting of impacts.

The first decisions on TEN priority projects were taken prior to any common TEN appraisal framework. The extent to which formal appraisal did serve as a factor in the decision is not known, but even if it did it is likely that, recalling the variety of methods in use in different countries which we noted above, different Member States were employing different methods from one another to appraise projects relevant to them. In so far as responsibility for taking these projects forward lay with the national governments this perhaps posed no fundamental difficulty, but where EU funds were being sought as a means of part-financing the projects one would imagine that a European framework would have been required.

In the comprehensive reviews of progress with the TEN-T which took place during 2003 (HLG, 2003; and CEC, 2003b), apparent problems with the initial decision-making process and its outcome – the 1996 set of projects - were acknowledged. Despite this, the decision was taken to maintain that set of projects within the TEN-T programme, and then to use an enhanced process to identify further projects to the programme.

The Van Miert High-Level Group was successful in refining the TEN-T guidelines and the process for identifying priority projects. The appraisal process described in their report has a sound logic to it, though it appears to us to be some way from the state of the art in technical appraisal – no doubt, this is in part a reflection of the constraints on adopting the state of the art in practice noted above. The Commission's subsequent 'Extended Impact Assessment' of the proposals drawn up by the Van Miert Group represents a major exercise in impact assessment and a major contribution to the appraisal process. Focusing on assessment at the programme rather than the project level, it successfully demonstrates the benefits of the Van Miert proposals in comparison to previous TEN-T scenarios, though it does seem to raise a number of interesting question marks as well. In all of this, it has to be acknowledged that the appraisal of strategic routes crossing several Member States and often at different planning stages from concept to near-implementation is a very challenging task indeed.

Funding mechanisms have also been problematic. The new TEN-T Guidelines place renewed emphasis on EU co-financing and, with the new regulation and proposal for financial perspectives, seek to increase the impact of that EU co-financing. Included within this are new financing instruments widening the range of tools available to mobilize funds, in particular in relation to cross-border projects which appear to have proved particularly difficult to take forward. However, there appears to be no clear link between the share of funding responsibilities and the incidence of benefits. Where the majority of a project's benefits accrue in one or other Member State it would seem reasonable that the country in question takes on the major share of the responsibility for funding, where as it would seem reasonable for the EU to take on

that major responsibility for projects where the majority of benefits are of a trans-national or EU nature, e.g. cross-border projects.

The failure thus far of pricing proposals to bring adequate cross funding from road represents a key problem in relation to financing. Agreement amongst all key stakeholders on infrastructure charging and arrangements for cross-financing has proved extremely difficult to achieve, yet whilst new financing models may provide some additional impetus, progress with revised Eurovignette and other infrastructure charging proposals will be important in actually generating new funds.

These financing constraints make prioritising allocation of funds to those projects that contribute most to the objectives even more important. That is, while financing continues to be a problem it is even more important to focus on establishing an effective appraisal and decision-making framework. This is likely to involve a framework capable of bringing forward a wide range of schemes – large and small – and testing them against one another in terms of their benefits and scope for implementation. For example, projects focusing on raising capacity and prioritising freight might be found to deliver a large proportion of the benefits associated with provision of new high speed lines, but might be less costly and more capable of being implemented in the short to medium term.

In summary, tackling these investments and financing issues requires action to:

- Focus investment on the most beneficial projects
- Continue work to improve decision making processes, to ensure rigorous appraisal of options and to link financing more closely to the incidence of benefits
- Make available new sources of funds, as would come from implementation of more appropriate pricing on roads and the use of cross financing

V Conclusions and recommendations

The 2001 White Paper on transport is most certainly an important step forward in improving the transport sector in Europe. Especially in the freight transport sector, the influence of the White Paper is remarkable: the decline in rail transport has come to an end, and the growth in road freight transport is slower than GDP growth. In passenger transport, the most remarkable achievement is the improvement of road safety, and the liberalization of the air services that, even if partial, has generated the low-cost companies phenomenon. On the freight side, progress has also been made, and the White Paper is generally on the right track for further implementation.

It can be concluded that the advancement of the implementation activities at the level of the EC is fairly high. On almost all measures there have been follow-up activities. Sixty-five directives, regulations and decisions have been adopted by the European institutions and twenty-seven proposals of the Commission are still pending (status April 2005). However, at the level of the Member States the advancement of the implementation is much lower. Moreover, the transport market changes slowly, even when the appropriate legislation is approved and adopted. Companies have difficulties to develop and produce new services that are in line with the new legislation or make use of new technologies. It may be worthwhile to focus in the second period of the White Paper on implementation issues, trying to overcome local political or financial barriers by building in incentives. Good example is the SESAME project that is a technological initiative of industrial partners that builds upon the new legislation on the Single European Sky. Another example is the Marco Polo initiative that enables stakeholders to achieve multimodality. A closer participation of local stakeholders, both public and private, can accelerate policy implementation and shorten the time between adoption of legislation and observation of impacts.

The results of the mid-term assessment does not give cause for large changes in transport policy. It is too early to conclude that an other package of measures is needed. The measures proposed in the White Paper in 2001 are still valid and will, if implemented rigorously, have impacts whose magnitude however is uncertain. Moreover, some of the measures – and already objectives – are conflicting. However, the policy scenario analysis showed that only a small part of the potential policy impact is achieved if the White Paper is partially implemented, most of the impact is only achieved when the White Paper is fully implemented or when the extended policy scenario is implemented. It must therefore be concluded that a stronger policy effort is needed to implement also the more difficult, but also more effective, measures, most importantly pricing measures such as infrastructure pricing, fossil fuel tax and airport charges.

This chapter provides further conclusions and recommendations towards the 12 White Paper policies.

V.1. Action Priority 1: Shifting the balance between modes of transport

When considering the general objectives of the White Paper in connection with the transport sector, one could say that it is today more than ever desirable to achieve a more sustainable transport system. Therefore the priorities should be set to include environmental and social costs of transport in order to give correct signals for individual and companies trip, distance and modal choice.

It can be questioned whether the keeping the modal split constant at the level of 1998 is sufficient to achieve more sustainable transport. But at the same time it is wrong to assume that shifting from road to

other transport modes is always environmentally friendly. The road transport sector has been able to grow its market share and improve its environmental performance, as a result of adequate legislation. From an economic point of view, modal shift is important for the marginal transport modes, but their capacity is too limited to have a major impact on the totals. Road transports account for 76% and rail transports for a mere 6% of land transport (passenger-km). Even doubling rail transports — through massive subsidies to the rail — would reduce road transports by only about 6%, its increase in two or three years.

Therefore, shifting as much as possible can be helpful, but is no substitute for action of the main and further growing modes, road freight transport, passenger car travel and aviation. A good example of the potential of technological measures is the Euro-standards for cars and trucks, that have brought some road transport emissions³⁵ to more than half its size the last decade, despite the fact that the transport volumes have grown. This has made road transport, in some cases, even less polluting per tonne-kilometre.

A similar policy has to be implemented for the main greenhouse emissions, CO₂, that is still growing in the road freight sector and most notoriously in aviation. The recent rise of oil prices reflects a high willingness to pay but also the potential of price signals.

Other modes (bus, air, shipping) are lagging behind and need to catch up with e.g. efficient social marginal cost pricing or standardisation.

Rail transport has already proven to have relatively good environmental performance but it depends crucially on the load or utilisation factor (as much as its economic viability), on the noise and exhaust emission characteristics of its traction and rolling stock, and the electricity generation. The modernisation of the rolling material does take a considerable time, notably longer than the strongly competing road mode. However a significant and quickly accessible potential for environmental improvement is to increase rail's share of regenerative electricity. This could immediately set their climate emissions to zero, which would give rail an undisputable advantage, as is already practised in Sweden and Switzerland, but it would challenge the public acceptance of nuclear power.

The modal split objective could therefore be more adjusted towards:

- first, supporting European economic growth and personal mobility, notably by reducing congestion
- secondly, focussing on sustainable growth, considering the external costs of different transport modes

The combined effects of land use tendencies (unstoppable sprawl), public budget constraints (growing), security (public transport), export perspectives for high-tech devices, production mix transported (more high value light stuff, less minerals and grains), working habits (less commuting, fixed in space and time), more leisure time (not vocational to collective transport), and finally even considerations of cost-effectiveness, all together suggest that car and truck transport are unavoidable. A possible shift of environmental priority towards enhanced motor technology instead of modal change is therefore recommended³⁶.

³⁵ NO_x and PM in 1990-2000.

³⁶ Albeit the environmentally enhanced motor technology is not part of the common transport policy.

V.1.1. *Improving quality in the road transport sector*

The White Paper addresses the improvement of the quality in the road freight sector quite well. Most measures are on track and can be expected to have been implemented by 2010.

However, one measure is not on track and needs further attention: the harmonisation of clauses in commercial road transport contracts (price revision in case of oil price increase). This might help to protect carriers from pressure from consignors.

In general, in an enlarged and globalizing Europe, regulation of the road transport sector needs to be further accelerated to let the road freight sector compete in a fair and efficient way across Member States and with other modes as rail, inland waterways, and short sea shipping. Examples are: further regulation and training of professional drivers, safety regulations and improvement of working conditions.

V.1.2. *Revitalizing the railways*

Rail reform based on open access is making good progress in the freight sector, although more slowly than might have been anticipated in the White Paper. Continuing to press existing policies appears the right approach here.

In the passenger sector, open access has scarcely been implemented yet, but there is reason to doubt whether it will be very effective. Compulsory competitive tendering appears more appropriate here, but it has not been possible to agree on its implementation, and regional and national rail services are specifically excluded from the latest EC proposals.

Within the rail sector, the diversity and the level of infrastructure charging regimes and the high charges in some countries – particularly new Member States – are a problem. The latter might be tackled by making support for infrastructure investment and a more efficient pricing for the competing modes, given the high opportunity cost and general inefficiency of public subsidies to operations.

In summary, then, whilst it seems clear that progress is slower than was hoped for by the Commission at the time of the White Paper, significant progress is being made. Regarding freight traffic, the appropriate policy is to continue to press for the full implementation of the measures already adopted in those countries which have been slow to do so. Significant areas requiring further attention are:

- The problems caused by high infrastructure charges for rail freight in some countries, particularly amongst the new Member States. This might be tackled as part of a funding package for rail infrastructure in those countries.
- The need to accelerate reform in the passenger sector, where competitive tendering appears to offer better prospects for competition than open access does.
- The need to tackle the issue of appropriate charging on competing modes, where we understand that the Commission plans a further communication later this year.

V.1.3. Controlling the growth in air transport

The following paragraphs outline in more detail recommendations for changes of the aviation-specific measures in order to achieve a higher degree of compliance with the objectives of the White Paper.

Concerning the elimination of bottlenecks in the European airspace structure, the Single European Sky (SES) legislation seems to be a sufficient measure at present; a critical review, however, in a 4 to 5 year time-frame should assess any shortcomings. The technical implementation programme SESAME, which intends to harmonise air traffic control infrastructure, is a crucial point to realise the benefits connected with the SES initiative, such as delay reductions, reductions in fuel consumption, long-run cost savings for airspace users and a common labour market for controllers. To be effective, this project needs funding and support. The implementation is scheduled to be realised by 2020, but it is recommended to speed up the implementation phase. The earlier a common air traffic management technology is implemented, the earlier the monetary and environmental benefits will materialise.

For several years, the Commission intended to harmonise safety standards, certification of aeronautical products and licensing of personnel in order to reduce costs and increase safety levels. These efforts resulted in the creation of the European Aviation Safety Agency (EASA). For this agency, it could be considered to widen its scope of competence when it becomes obvious that a harmonised and centralised approach through EASA could reduce complexity and costs. The additional competences could range from the oversight and technological regulation of airports and air navigation services providers to the creation of standards for the safety of third country aircraft in the EC. The Commission has acted in the latter case, although there are still some deficits concerning the quantitative and qualitative harmonisation of ramp checks. Standardisation under the auspices of EASA could avoid evasion behaviour of airlines that shift their operations to other Member States in case they have been banned to operate in one Member State.

Concerning airport charges, it is difficult to achieve a regulation satisfying all airports, taking into account the different kinds of function, size and ownership structures. Where appropriate, it could be advisable that a framework regulation of airport charges should create incentives to increase the airport operator's efficiency, to relocate traffic from on-peak to off-peak phases or from primary to secondary airports. Furthermore, the inclusion of environmental aspects such as noise or local air quality should also be included in an airport charging framework to create incentives for airlines to use more modern aircraft. Prior to such a step, the effectiveness of economic instruments currently in use at various airports to reduce noise and emissions affecting local air quality should be assessed in order to develop a best-practice model.

Of prime interest for the contestability of airports is the slot allocation procedure. A groundbreaking reform of the slot allocation should be able to increase efficiency substantially. The introduction of market mechanisms in the allocation of slots is advisable to guarantee that those airlines will have the opportunity to use slots that value them most. Even if grandfathering is basically kept as a form of primary allocation, the allowance to trade slots on a secondary market could contribute considerably to lowering the market entry barriers. Additionally, it must be prevented that slot trading leads to an abuse of market power for carriers and their alliances at their home hub airports.

Concerning air service agreements with third countries, an efficient negotiation procedure has evolved after the ECJ decision of 5th November 2002, which should be maintained. In principle, air service agreements concluded by the Member States with third countries stay valid and will only be amended by a clause opening up the respective market to all EU carriers. This amendment is negotiated by the Commission on behalf of all Member States, therefore saving costs of individual negotiations. Negotiations concerning open aviation areas with states from eastern and south-eastern Europe and Asia, foremost

Russia, possibly Japan and China shall be started even when critics say that it is overambitious to start before a conclusion with the USA is reached. Progress on deals with Russia, China or Japan could be a catalyst for a more multilateral approach and are therefore well in line with the White Paper's objective of strengthening the external competences of the EU.

In the area of airport capacity expansion, the strategy should be focussed on finding alternatives, as many expansion projects face strong acceptance problems e.g on environmental issues. With the help of TEN-T funding, viable alternatives for air passengers to switch to high speed trains could be supported.

Concerning regulations for the compensation of air passengers, it is basically a political question how much protection and regulation is aspired. It could be argued that it could be left to the market, in how far compensation shall be paid. In case the consumers were well informed, they could decide by themselves if they prefer lower fares in combination with lower or no compensation or higher fares in combination with a higher level of compensation. A more market oriented regulation is possible to realise, as the examples of Canada and the USA show, making compensation payment levels a parameter in airline competition. Concerning further actions in the field of strengthening user rights, one has to be cautious, as for instance regulations on name changes or flight coupon use would severely affect the airlines' yield management principles and therefore be counterproductive for customers when a regulation in this regard would lead to higher prices for all consumers.

In the field of environmental legislation, major changes are necessary to achieve the White Paper's objective of a sustainable transport system. The effects of the decision to leave noise reduction in the course of a balanced approach (see II.6.3) to the Member States should be analysed more in detail. In case Member States are reluctant to implement measures to protect residents living near airports as they fear to create competitive disadvantages in comparison to other Member States, it could be considered to implement a more harmonised approach.

For the mitigation of greenhouse gas emissions, it is recommended to focus on the inclusion of aviation into the EU emission trading scheme. This instrument has several advantages in the environmental and economic regard over kerosene taxation and emissions-based en-route surcharges. In the first place, in an emission trading scheme, an overall cap of emissions is defined, making it therefore very effective from the environmental viewpoint. On the economic side, it is possible for the air transport sector, where abatement costs are relatively high, to buy reduction credits, or emissions permits to reach a very cost-efficient compliance.

When considering the general objectives of the White Paper and relating them to the recent developments of the air transport sector, one could come to the conclusion that it is today more than ever desirable to achieve a more sustainable transport system. Therefore, the priorities should be set to include social costs of transport into the individual travel and modal split decisions. The return to a modal split on the level of 1998, as desired by the White Paper, should be given up in favour of a consequent environmental legislation. Modal split alone is an insufficient indicator for the sustainability of the transport system. With a consequent environmental legislation, even a growing modal share of air transport could be more environmentally friendly than the fixation of aviation's share without any further flanking measures within the air transport sector.

V.1.4. Promoting transport by sea and inland waterway

Although sea and inland waterway transport is increasing, the potential is still large. The EU has 35 000 km of coastline and hundreds of sea and river ports.

Most of the measures in *sea transport* are on schedule. However, since the 2001 White Paper new technologies came available, as a broader use of gps, gsm and gprs. These communication technologies give a large potential for a radical reduction in customs and formalities by satellite tracing and tracking of ships. The envisaged impact is a faster shift from road (and rail) to short sea shipping.

Another important measure is the liberalization in ports. The approval and implementation of the directive would have a dynamic effect on port and needs to be monitored closely.

Finally, if promoting waterborne transport is to achieve the environmental objectives set out in the White Paper, it is important that the shipping industry aims for continuous improvement in environmental performance. This is particularly the case with respect to air emissions, where Euro-standards for road transport mean that large trucks are now up to 50 times less polluting per tonne-kilometre than maritime ships³⁷.

White Paper measures concerning maritime safety have been realized and need to be continued.

The framework to realize motorways of the seas is in place. Attention should be paid to the potential negative effects of the predicted increase in traffic volume resulting from the cheaper and faster transport that now becomes available. Maritime safety and environmental issues should be monitored closely.

In *inland waterways*, the River Information System is lagging behind schedule. Some Member States such as Austria and Nederland have advanced systems of RIS (River Information System), which makes this mode of transport still more reliable, efficient and accessible. It is expected that the river information system will be voluntary (but not obligatory) in 2010. This needs to be enforced by EC legislation with speeding up RIS and making RIS obligatory. The impact of RIS on travel time is significant. The travel time will decrease due to a harmonisation of current RIS systems. The vessels on the inland waterways have less trouble to switch over between the different information systems.

V.1.5. Turning intermodality into reality

Intermodality is seen as of fundamental importance for developing competitive alternatives to road transport. There have been few tangible achievements, apart from a few major ports with good rail or canal links, notably since the late nineties considerable growth in inland waterway and rail transport in the container segment has been observed, though always less than for road transport. The European transport market for containers can be segmented into maritime deep sea container (and a related feeder market) and a continental, intra-European, market. Both have different standards; the continental market is oriented more on speed and responsiveness, the deep-sea market is oriented more on cost and reliability. In order for the continental market to develop, it should provide a real alternative to present road transport within Europe, the use of the 2-pallet wide (and in some case 45ft) containers could be supportive. However standardisation to one single standard could be detrimental for some of the market segments.

³⁷ The emissions per tonne-km of road transport (EUROIV-EUROV 40 ton heavy duty vehicles) are 50 times lower for SO₂, 2.5 times lower for NO_x and at least 3 times lower for PM compared to maritime transport.

Further the new Community support programme 'Marco Polo' targeted on innovative initiatives, particularly to promote sea motorways, aims at developing intermodality. It seems that with enlarging the budget for Marco Polo II, a considerable shift from road transport to other modes will be realised. The results from the 1st call of Marco Polo show that an above target shift is realised by changing conventional road haulage solutions into, intermodal solutions wherein maritime, rail and inland waterways transport solutions are implemented. The effectiveness of Marco Polo II is likely to be increased by allowing also limited capital investment in infrastructure. In total the programme foresees a reduction of minimal 50 billion tonne kilometres of road transport in 2003-2006 (Marco Polo I in 3 years) and 350 billion tonne kilometres in 2007-2013 (Marco Polo II in 7 years). In Marco Polo a target is set: for each euro a 500 tonne kilometre reduction of road transport, based on the first call this is likely going to be higher.

V.2. Action Priority 2: Eliminating bottlenecks

V.2.1. *Building the Trans-European transport network*

The TEN schedule has been recently revised (2004) and is one of the White Paper policies that is on track at the European legislation level.

However, there are enormous delays, notwithstanding numerous initiatives being taken by the Commission. Financing appears to continue to be a major stumbling block, as national governments with competing claims on their resources struggle to prioritise funds for TEN-T projects. Whilst some progress has been made towards revising the Eurovignette and creating new sources of funds for TEN-T projects, the lack of success with the implementation of infrastructure charging has meant that a potentially key source of finance for the TEN-T has not become available.

Further efforts to progress the Commission's proposals on infrastructure charging are recommended, but in the face of continued financing constraints, attention should also be maintained on further enhancing the appraisal and prioritisation of TEN-T projects.

Tackling this requires action to:

1. Focus investment on the most beneficial projects, which may be more modest projects to make capacity available for freight rather than completely new high speed passenger lines. The identification and selection needs to be made more transparent towards the Member States, focussing on projects with highest European added value (as e.g. cross-border sections)
2. Improve decision making processes, to ensure rigorous appraisal of options and to link financing more closely to the incidence of benefits,
3. Make available new sources of funds, as would come from implementation of more appropriate pricing on roads and the use of cross financing. The Member States tend to neglect the benefits of cross border infrastructure, which means there is in principle a case for the EC intervening with funding to overcome that problem. There is a case for more funding, contingent on rigorous measures to ensure that the projects provide value for money.

More emphasis could be given on organizational measures, i.e. development of priority corridors for freight railways instead of new dedicated lines.

V.3. Action Priority 3: Placing users at the heart of transport policy

This includes a variety of policy areas. The priority advancement is needed in road safety and pricing issues.

Halving the number of people killed on European roads represents the ultimate target of the overall framework of road safety measure, which constitutes numerically 13% of all White Paper measures. A general conclusion could therefore be that the measures do indeed offer possibilities to improve road safety. However, the goal will not be achieved unless more measures are taken, focussing on road traffic as a whole.

Pricing is considered as the biggest failure in the implementation of the White Paper proposals, especially where it comes to appropriate infrastructure charging regimes for road and for air. Social marginal cost pricing is considered the most effective way in achieving a more efficient and sustainable transport growth. Despite the fact that the political challenges are huge, some countries (London congestion charging, German Maut) have taken the first steps already. It is the role of the EC to further support these developments and enforce social marginal cost pricing.

V.3.1. *Improving road safety*

We showed that two out of four scenarios will lead to a fatality reduction that meets the objectives of the EU for 2010. However, these scenarios are not the most likely scenarios. Therefore, to reach an effect that is both realistic and substantial, it is necessary to review the measures and if possible to adjust them.

With regard to the action levels, it is recommended to extend these with more levels that are known to be relevant for traffic safety. Harmonization is not equally effective for all fields mentioned, which is to be taken care of when further steps are taken in harmonization of BAC-level³⁸, speed limits etc. (see Annex XI.3.3). Measures that aim at European harmonization will be difficult for individual Member States to implement. Although it is difficult to decide e.g. what speed limits should be applied to which road types, all over Europe, we suggest that steps be taken to come to an advisory set of speed limits that correspond to road types (even if the implementation may take years). These road types might be based on principles concerning the function of the road, the vehicles that use the road, design of intersections etc. This links harmonization and technical improvements to areas like infrastructure and road user behaviour. A detailed problem analysis, as was done by Ecorys (2005) would help to clarify those areas where the maximum gain can be reached in terms of fatalities and helps to determine in which areas most effort should be invested.

The measures stated in the White Paper are in itself good measures but in order to reach maximum effect, they could be more specific. For each of the measures, it should be clarified which are the target groups they are directed at; is this an area in which safety effects may be reached, what do we know from prior research about the effects of this measures and how are we going to operationalise the measure. This would make the implementation of the measure more likely and at the same time it would increase the effectiveness of the measure, distinction should be made between measures directed at a reduction of fatalities, and measures directed at facilitation of research and policy. Measures should also be reviewed in terms of cost-effectiveness. For some of the measures mentioned in the extended scenario, cost-effectiveness studies have already been carried out. It may be worth the effort to perform a robust cost

³⁸ BAC: gram alcohol per litre blood

effectiveness assessment for some of the most straightforward measures and best practises, when applied in different countries. It may perhaps help Member States to decide for implementation of measures that are especially cost-effective for that Member State.

Finally, to be able to make estimations of effects of measures on road safety, many assumptions have been made. These assumptions are not necessarily reality. For example, with regard to harmonising alcohol controls, it is assumed that setting the European BAC-limit at 0.5 g/l will only have a safety effect in countries with a BAC limit above 0.5 g/l. Also, with regard to *soft nose*, the assumption is made that after 12 years the whole car fleet will be equipped with 'soft' fronts (in reality, there will still be cars older than 12 years). It would be good to clarify these assumptions and, if these assumptions turn out to be highly unlikely, to replace the measures by others that are more specific and based on more extensive research.

A last remark may be made about accident data. With CARE and IRTAD data, the more straightforward statistics are available. For a sophisticated study like this, statistics are actually not sufficient. For this type of research it is actually necessary to have access to the entire database of accident data of each country. Nowadays it is technically possible to offer web enabled access to databases. Only very few countries use this technique. Perhaps it leads too far outside the field of the White Paper assessment, but we would like to give this idea into consideration: enhance the use of web-enabled access to accident databases of individual Member States.

In sum, we recommend

1. Clarify and specify the measures stated in the White paper (guidelines or even legislation on speed limits, BAC etc.)
2. Conduct cost-effectiveness analyses or reviews in order to decide what measures to implement
3. Distinguish between policy and research facilitating measures and road safety measures
4. Shift the attention from those measures that are either less effective, less specific, or for which the assumptions are questionable, to new measures as described in paragraph 3.12. of Annex XI (Day-time Running Lights, Sustainable Safe infrastructure in urban and rural area's etc.).
5. Enhance the use of web-enabled access to accident databases of individual Member States

V.3.2. *Effective charging for transport*

The biggest failure in implementation of the White Paper proposals is the failure to implement appropriate Social Marginal Cost Pricing for all transport modes, in order also to deal efficiently with the environmental issues (and taking into account the present and foreseeable price and taxation of oil products).

This policy has had very slow implementation and in some Member State no advancement at all is made. Especially in the new Member States activities aiming at introducing effective charging for transport is lagging behind or non-existent. But also in the European Commission and in the old Member States the implementation activities on road pricing are low, though some Member States like Germany, the United Kingdom, Denmark, Austria do show progress in the adoption of road charging schemes, independently of EC legislation

Nevertheless, the White Paper's charging policy offers the possibility of managing transport demand and, hence, limiting the negative impacts of transport, at the same time as generating a source of revenue which can be used to finance key transport infrastructure investments.

It is understood that a major part of the impact on transport volumes can be done with pricing policy. In other words, marginal social cost pricing is absolutely crucial to the Commission's policy on preventing

further shifts in mode split towards environmentally damaging modes. This certainly requires proposals for full implementation of marginal social cost pricing on all modes of transport to be brought forward urgently, together with guidance on how to calculate marginal social cost and implement the policy.

Achieving agreement on progress here may need new approaches to the use of revenue to reassure industry that it will not be made less competitive by the move and to buy off opposition from peripheral countries. It is appreciated that this is very difficult given that revenue from the charges goes to the Member States and not to the EC.

V.3.3. *Recognizing the rights and obligations of users*

In general, these measures are on schedule. The few measures that are lagging behind, as public services obligations and consumer rights, are being reinforced. The Commission has just adapted a new revised proposal on public transport and public service obligations.

V.3.4. *Developing high-quality urban transport*

The European Commission does not control urban transport issues directly (due to the subsidiarity principle) therefore results of their initiatives regarding urban transport also rely on the efforts of the contributing partners (e.g. local authorities, public transport companies...). The authorities and organisations co-operating in prestigious, innovative European projects are keen to turn the projects into a success. Care should be taken when the successful measures of these projects are applied all across Europe. Some cities or urban areas might be less motivated to implement the suggested measures, decreasing the changes on a successful deployment. In order to get commitment from the local authorities, it is important for the Commission to involve them in the decision process regarding urban transport issues.

The most effective measures to reduce traffic volumes in urban areas are:

1. charging (e.g. the London Congestion Charging),
2. access restrictions (e.g. the “Zone a Traffico Limitato” in Rome) and
3. parking management (e.g. Winchester, Rotterdam).

Although there is no technologic challenge in introducing these measures, the political challenge is considerable. The introduction of these measures can, on the short term, upset groups of citizens if their travel times (or costs) increase, or if they risk losing customers. When introducing these measures, it is important to guarantee a good accessibility of the affected areas by public transport and slow modes. Special attention should be paid to residents and people with a reduced mobility, e.g. by granting them entry permissions or parking facilities at reduced fares.

The role of the Commission in introducing these effective measures is limited. The Commission can promote the measures and organise the platform to share knowledge and experiences on e.g. the technical implementation of the measures or on the organisation of public participation in the decision process.

Charging, access restrictions and parking management may be the most effective individual measures to reduce traffic volumes in urban areas. However, it is good practice to apply a coherent set of a variety of measures. These measures can include the promotion and improvement of public transport, the promotion of slow modes and improvement of their facilities or the integration of land use and transport planning.

Another way to reduce the impact of transport on urban life is the promotion of clean fuels and vehicles that emit less air pollutant, greenhouse gases and noise. This Commission has responsibility on this policy issue. Although clean fuels and vehicles are not limited to urban areas, the urban environment is where pollution from transport has its greatest impact. It is therefore important to ensure that urban transport plans and town planning take into account the environmental impacts of transport.

The White Paper is surprisingly brief on cycling. Cycling generates zero-emissions and is beneficial for human health. For short distance in the urban area, cycling can be a valid alternative for the private car. The modal share of cycling trips varies among European countries from 1% to 27%. In some cities in The Netherlands, as much as 50% of the city trips are cycling. The Commission can play an active role in putting cycling on the agenda of transport policy discussions and provide support in the coordination of the many actors involved in policy planning regarding cycling issues.

The Commission can be a factor in the enforcement of urban transport issues at the Members State level by further disseminating the results of such projects as CIVITAS and LUTR³⁹ on urban transports, financed under the 5th and 6th research framework programmes. Besides, the upcoming Thematic Strategy on the Urban Environment is expected to contribute to better urban transports, by encouraging Member States to develop sustainable urban transport plans and by promoting exchanges of good practice amongst local authorities.

V.3.5. *Putting research and technology at the service of clean and efficient transport*

The measure in the policy on putting research and technology⁴⁰ at the service of clean, efficient transport is having its implementation through the 5th and 6th Framework Programmes.

This policy is on its implementation track and does not need further acceleration.

V.4. Action Priority 4: Managing the globalization of transport

V.4.1. *Managing the effects of globalization*

The processes of further enlargement have to be taken into consideration during the revision of the White Paper. Even, if the date of next enlargements is not sure yet, it is on the horizon. In the case of current new Member States it has appeared that the national priorities of transport policy considerably differ from WP objectives, and then implementation of measures is lagging behind in many cases. It will be even more relevant for future Member States. Then all specific factors and barriers which will have to be overcome, should be identified at present.

Among *political barriers* the special attention is given to the political acceptance of proposed instruments. In the case of new Member States and Candidate Countries, it can be expected that taking into consideration macroeconomic environment and priorities of economic growth, political acceptance is not easy to achieve. This is not new, there is always a tension between national priorities and EU needs, specifically in peripheral countries and less wealthy countries. This is especially true in the range of compli-

³⁹ Land Use Land Use and Transportation Research: Policies for the City of Tomorrow, www.lutr.net

⁴⁰ Policy 11 focuses on research. Issues as clean vehicles and biofuels can be found under policy 8 on charging.

cated objectives and measures, which implementation will require high financial resources, while effects are not measurable very often and not very easy to transfer to high economic growth. A part of the White Paper priorities has already been built into EU legislation (e.g. TEN Guidelines), and the needs of basic objectives such as the internal market, environmental integration and cohesion will keep on putting pressure for EU-wide legislation conciliating the different national interests. Meanwhile, during economic transformation quick positive effects are expected. That is why objectives related to internalization of external costs, reforming road taxation, technical improvements, social harmonization are not treated as a super priority.

Legal and regulatory barriers relate to the lack of legislation or equivocal legal interpretations. The level of regulatory order and experiences concerning reforming legal system in the transformed economy seems to be very important. In addition, the quality of implemented regulations and effectiveness of their implementation has to be improved.

In the range of ***institutional and organizational barriers***, issues related to the lack of institutional organizations have to be considered. In the macro-scale it is a lack of clarity or overlaps in institutional power and competencies and arising from misfits or inadequacy within the organizations of transport sector, level of reforms of institutions responsible for transport policy, decentralization of state administration; while at the micro level, the restructuring process of transport enterprises should be taken into account. Then, the questions of institutional and organizational barriers should be considered on two levels, i.e. administration and transport enterprises.

Social and cultural barriers arise from the presence of different mentalities, traditions, biases, etc, includes public resistance prior to implementation and issues affecting working conditions. The basis of the barriers are cultural and social conditions like links with European culture, post-socialist heritage, level of personal and economic freedom. Moreover, the level of education plays an important role in this field, and also level of unemployment seems to be an important barrier. The higher unemployment, stronger social conflicts and lower acceptance of transport users and non-users for new measures. These factors determine the activity of the sphere of social dialogue.

Technological/technical/infrastructure barriers relate to technological misfits or inadequacy. The condition of the transport infrastructure in the new member States has been determined by the investment policy during the centrally planned economy, and by the new technological improvements during transformation. As a post-socialist heritage new Member States (and three candidate countries) own transport infrastructure network of a high quantity and a rather low quality and low level of new modern technologies. In order to modernize the transport sector, high investments are needed, including the involvement of private capital (e.g. by public and private partnership schemes). Meanwhile, the barriers which have to be overcome are very strong. There is a shortage of public resources, and a presence of unclear financial regimes. The technological improvements are not stimulated efficiently. Moreover, political and social acceptance can be expected in the range of improving quality of road transport, reducing accidents etc. but not for controlling growth in air transport, promoting intermodal transport or placing users in the heart of policy. Also, it should be added that in liberal young market economies, strong interventions on transport market will not be welcomed. To conclude, in new Member States and Candidate Countries, all measures aiming at modernization of the transport network are crucial. Moreover, in the case of new Member States and candidate countries, the access to the EU funds is needed.

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