



White Paper on transport

Directorate-General
for Mobility
and Transport



- ROADMAP TO A SINGLE EUROPEAN TRANSPORT AREA —
TOWARDS A COMPETITIVE AND RESOURCE-EFFICIENT TRANSPORT SYSTEM

THIS ILLUSTRATED BROCHURE COMPRISES THE TEXT OF THE EUROPEAN COMMISSION'S WHITE PAPER 'ROADMAP TO A SINGLE EUROPEAN TRANSPORT AREA — TOWARDS A COMPETITIVE AND RESOURCE-EFFICIENT TRANSPORT SYSTEM' (COM(2011) 144 FINAL OF 28 MARCH 2011) AND A FOREWORD BY VICE-PRESIDENT SIIM KALLAS, COMMISSIONER FOR TRANSPORT.

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FOREWORD



I am proud to present this 'Roadmap to a single European transport area'.

This strategic document presents the Commission's vision for the future of the EU transport system and defines a policy agenda for the next decade. The programme in question is part of the Europe 2020 strategy and its flagship initiative for a resource-efficient Europe.

Efficient transport is a precondition for maintaining the EU's prosperity — we need less congestion, fewer emissions, more employment and more growth. It is also key to a well-functioning internal market and the ability of all of our regions to remain part of a fully integrated world economy. Transport is also an important part of the economy itself: many European companies are world leaders in infrastructure, logistics and the manufacture of transport equipment and traffic management systems. We must keep it that way.

However, in a world of rising oil prices, growing congestion and looming climate change, the EU's transport system needs a radical overhaul to maintain its role of growth engine and keep pace with mounting global competition. In order to avoid having to limit our freedom of movement, we need to break the shackles of transport's dependency on oil, but without sacrificing its efficiency.

The strategy established in this White Paper shows how this transformation can be achieved. It defines 10 very challenging goals designed to guide policy actions and measure progress — including phasing out conventionally fuelled cars from cities by 2050, and a 50% shift in middle distance passenger and longer distance freight journeys from road to other modes by the same date — to achieve a 60% reduction in CO₂ emissions and comparable reduction in oil dependency. These are underpinned by 40 concrete initiatives — to be developed over this decade. I am fully committed to putting forward key proposals during my term as Commissioner for Transport.

At the same time, this White Paper also defines a strategy to which all transport stakeholders should contribute. No overhaul of the transport system will be possible without concerted action involving national, regional and local authorities, transport operators and transport users. I invite all readers to rise to the challenge and work alongside the European Commission in producing a more competitive and resource-efficient transport system.

Siim Kallas
Vice-President of the European Commission,
Commissioner for Transport



CONTENTS

| | |
|--|-----------|
| 1. Preparing the European transport area for the future | 4 |
| 2. A vision for a competitive and sustainable transport system | 6 |
| 2.1. Growing transport and supporting mobility while reaching the 60 % emission reduction target | 6 |
| 2.2. An efficient core network for multimodal intercity travel and transport | 7 |
| 2.3. A global level playing field for long-distance travel and intercontinental freight | 8 |
| 2.4. Clean urban transport and commuting | 8 |
| 2.5. Ten goals for a competitive and resource-efficient transport system: benchmarks for achieving the 60% GHG emission reduction target | 9 |
| 3. The strategy — what needs to be done | 10 |
| 3.1. A single European transport area | 10 |
| 3.2. Innovating for the future — technology and behaviour | 12 |
| 3.3. Modern infrastructure, smart pricing and funding | 14 |
| 3.4. The external dimension | 17 |
| 4. Conclusion | 18 |
| Annex: List of initiatives | 19 |



1. PREPARING THE EUROPEAN TRANSPORT AREA FOR THE FUTURE

4

1. Transport is fundamental to our economy and society. Mobility is vital for the internal market and for the quality of life of citizens as they enjoy their freedom to travel. Transport enables economic growth and job creation: it must be sustainable in the light of the new challenges we face. Transport is global, so effective action requires strong international cooperation.
2. The future prosperity of our continent will depend on the ability of all of its regions to remain fully and competitively integrated in the world economy. Efficient transport is vital in making this happen.
3. European transport is at a crossroads. Old challenges remain but new have come.
4. A lot needs to be done to complete the internal market for transport, where considerable bottlenecks and other barriers remain. We need to readdress these issues — how to better respond to the desire of our citizens to travel, and the needs of our economy to transport goods while anticipating resource and environmental constraints. The transport systems of the eastern and western parts of Europe must be united to fully reflect the transport needs of almost the whole continent and our 500 million citizens.
5. Oil will become scarcer in future decades, sourced increasingly from uncertain supplies. As the International Energy Agency has recently pointed out, the less successful the world is in decarbonising, the greater will be the oil price increase. In 2010, the oil import bill was around EUR 210 billion for the EU. If we do not address this oil dependence, people's ability to travel — and our economic security — could be severely impacted with dire consequences on inflation, trade balance and the overall competitiveness of the EU economy.
6. At the same time, the EU has called for, and the international community agreed on, the need to drastically reduce world greenhouse gas (GHG) emissions, with the goal of limiting climate change below 2°C. Overall, the EU needs to reduce emissions by 80–95 % below 1990 levels by 2050, in the context of the necessary reductions of the developed countries as a group, in order to reach this goal. Commission analysis⁽¹⁾ shows that while deeper cuts can be achieved in other sectors of the economy, a reduction of at least 60 % of GHGs by 2050 with respect to 1990⁽²⁾ is required

⁽¹⁾ See the Commission communication 'A roadmap for moving to a competitive low carbon economy in 2050' (COM(2011) 112).

⁽²⁾ This would correspond to emissions cuts of around 70 % below 2008 levels.

- from the transport sector, which is a significant and still growing source of GHGs. By 2030, the goal for transport will be to reduce GHG emissions to around 20% below their 2008 level. Given the substantial increase in transport emissions over the past two decades, this would still put them 8% above the 1990 level.
7. Since the first big oil crisis 40 years ago — despite technical progress, potential for cost-effective energy efficiency improvements and policy efforts — the transport system has not fundamentally changed. Transport has become more energy efficient, but EU transport still depends on oil and oil products for 96% of its energy needs. Transport has become cleaner, but increased volumes mean it remains a major source of noise and local air pollution.
 8. New technologies for vehicles and traffic management will be key to lower transport emissions in the EU as in the rest of the world. The race for sustainable mobility is a global one. Delayed action and timid introduction of new technologies could condemn the EU transport industry to irreversible decline. The EU's transport sector faces growing competition in fast developing world transport markets.
 9. Many European companies are world leaders in infrastructure, logistics, traffic management systems and manufacturing of transport equipment — but as other world regions are launching huge, ambitious transport modernisation and infrastructure investment programmes, it is crucial that European transport continues to develop and invest to maintain its competitive position.
 10. Infrastructure shapes mobility. No major change in transport will be possible without the support of an adequate network and more intelligence in using it. Overall, transport infrastructure investments have a positive impact on economic growth, create wealth and jobs, and enhance trade, geographical accessibility and the mobility of people. It has to be planned in a way that maximises positive impact on economic growth and minimises negative impact on the environment.
 11. Congestion is a major concern, in particular on the roads and in the sky, and compromises accessibility. In addition, transport infrastructure is unequally developed in the eastern and western parts of the EU which need to be brought together. There is increased pressure on public resources for infrastructure funding and a new approach to funding and pricing is needed.
 12. Since the 2001 White Paper on transport, a lot has been achieved. Further market opening has taken place in aviation, road and partly in rail transport. The single European sky has been successfully launched. The safety and security of transport across all modes has increased. New rules on working conditions and on passenger rights have been adopted. Trans-European transport networks (financed through TEN-T, Structural Funds and the Cohesion Fund) have contributed to territorial cohesion and the building of high-speed railway lines. International ties and cooperation have been strengthened. A lot has also been done to enhance transport's environmental performance.
 13. Still, the transport system is not sustainable. Looking 40 years ahead, it is clear that transport cannot develop along the same path. If we stick to the 'business as usual' approach, the oil dependence of transport might still be little below 90%⁽³⁾, with renewable energy sources only marginally exceeding the 10% target set for 2020. CO₂ emissions from transport would remain one third higher than their 1990 level by 2050. Congestion costs will increase by about 50% by 2050. The accessibility gap between central and peripheral areas will widen. The social costs of accidents and noise would continue to increase⁽⁴⁾.
 14. Building on the lessons learnt, this roadmap takes a global look at developments in the transport sector, at its future challenges and at the policy initiatives that need to be considered. The Commission's vision of future transport is presented in Part 2. Key measures to achieve it are outlined in Part 3, summarised in the annex, and described in more detail in the accompanying staff working document.



⁽³⁾ Even in this scenario there would still be some increase in the use of biofuels and electricity compared to today.

⁽⁴⁾ A description of how transport could evolve up to 2050 if new policies did not intervene to modify the trends (reference scenario) can be found in Appendix 3: 'Reference scenario (2010–50)' of the accompanying Impact assessment SEC(2011) 358.

2. A VISION FOR A COMPETITIVE AND SUSTAINABLE TRANSPORT SYSTEM

2.1. Growing transport and supporting mobility while reaching the 60% emission reduction target

15. There is a large pay-off in taking decisive policy action. The transport industry in itself represents an important part of the economy: in the EU it directly employs around 10 million people and accounts for about 5% of GDP.
16. The EU and governments need to provide clarity on the future policy frameworks (relying to the greatest extent possible on market-based mechanisms) for manufacturers and industry so that they are able to plan investments. Coherence at EU level is vital — a situation where (for example) one Member State opted exclusively for electric cars and another only for biofuels would destroy the concept of free travel across Europe.
17. The challenge is to break the transport system's dependence on oil without sacrificing its efficiency and compromising mobility. In line with the flagship initiative 'Resource-efficient Europe' set up in the Europe 2020 strategy⁽⁵⁾ and the new 'Energy efficiency plan 2011'⁽⁶⁾, the paramount goal of European transport policy is to help establish a system that underpins European economic progress, enhances competitiveness and offers high-quality mobility services while using resources more efficiently. In practice, transport has to use less and cleaner energy, better exploit a modern infrastructure and reduce its negative impact on the environment and key natural assets like water, land and ecosystems.
18. Curbing mobility is not an option.
19. New transport patterns must emerge, according to which larger volumes of freight and greater numbers of travellers are carried jointly to their destination by the most efficient (combination of) modes. Individual transport is preferably used for the final miles of the journey and performed with clean vehicles. Information technology provides for simpler and more reliable transfers. Transport users pay for the full costs of transport in exchange for less congestion, more information, better service and more safety. Future development must rely on a number of strands:
 - > improving the energy efficiency performance of vehicles across all modes; developing and deploying sustainable fuels and propulsion systems;

⁽⁵⁾ COM(2010) 2020.

⁽⁶⁾ COM(2011) 109.

- > optimising the performance of multimodal logistic chains, including by making greater use of inherently more resource-efficient modes, where other technological innovations may be insufficient (e.g. long-distance freight);
 - > using transport and infrastructure more efficiently through use of improved traffic management and information systems (e.g. ITS, SESAR, ERTMS, SafeSeaNet, RIS), advanced logistic and market measures such as full development of an integrated European railway market, removal of restrictions on cabotage, abolition of barriers to short sea shipping, undistorted pricing, etc.
20. Action cannot be delayed. Infrastructure takes many years to plan, build and equip — and trains, planes and ships last for decades — the choices we make today will determine transport in 2050. We need to act on a European level to ensure the transformation of transport is defined together with our partners rather than determined elsewhere in the world.
 21. Solving the problems identified above means meeting very difficult goals by 2050 — and challenging ones by 2020–30 to ensure we are moving in the right direction. The scope for changing the way transport operates varies across transport segments, as the technological options for each segment are different. In the following, the Commission's vision therefore considers three major transport segments: medium distances, long distances and urban transport. Delivery of this will rely on many actors — the EU, Member States, regions, cities, but also industry, social partners and citizens will have their part to play.
- ## 2.2. An efficient core network for multimodal intercity travel and transport
22. In the intermediate distances, new technologies are less mature and modal choices are fewer than in the city. However, this is where EU action can have the most immediate impact (fewer constraints from subsidiarity or international agreements). More resource-efficient vehicles and cleaner fuels are unlikely to achieve on their own the necessary cuts in emissions and they would not solve the problem of congestion. They need to be accompanied by the consolidation of large volumes for transfers over long distances. This implies greater use of buses and coaches, rail and air transport for passengers and, for freight, multimodal solutions relying on waterborne and rail modes for long hauls.
 23. Better modal choices will result from greater integration of the modal networks: airports, ports, railway, metro and bus stations should increasingly be linked and transformed into multimodal connection platforms for passengers. Online information and electronic booking and payment systems integrating all means of transport should facilitate multimodal travel. An appropriate set of passengers' rights has to accompany the wider use of collective modes.
 24. Freight shipments over short and medium distances (below some 300 km)⁽⁷⁾ will to a considerable extent remain on trucks. It is therefore important, besides encouraging alternative transport solutions (rail, waterborne transport), to improve truck efficiency, via the development and the uptake of new engines and cleaner fuels, the use of intelligent transport systems and further measures to enhance market mechanisms.
 25. In longer distances, options for road decarbonisation are more limited, and freight multimodality has to become economically attractive for shippers. Efficient co-modality is needed. The EU needs specially developed freight corridors optimised in terms of energy use and emissions, minimising environmental impacts, but also attractive for their reliability, limited congestion and low operating and administrative costs.
 26. Rail, especially for freight, is sometimes seen as an unattractive mode. But examples in some Member States prove that it can offer quality service. The challenge is to ensure structural change to enable rail to compete effectively and take a significantly greater proportion of medium- and long-distance freight (and also passengers — see below). Considerable investment will be needed to expand or to upgrade the capacity of the rail network. New rolling stock with silent brakes and automatic couplings should gradually be introduced.



⁽⁷⁾ More than half of all goods (in terms of weight) in road transport are moved over distances below 50 km and more than three quarters over distances below 150 km, according to calculations based on Eurostat data.

27. On the coasts, more and efficient entry points into European markets are needed, avoiding unnecessary traffic crossing Europe. Seaports have a major role as logistics centres and require efficient hinterland connections. Their development is vital to handle increased volumes of freight both by short sea shipping within the EU and with the rest of the world. Inland waterways, where unused potential exists, have to play an increasing role in particular in moving goods to the hinterland and in linking the European seas.

2.3. A global level playing field for long-distance travel and intercontinental freight

28. The maritime and aviation sectors are inherently global. Improving the efficiency of aircraft and traffic management operations has to be pursued in the air sector. It will secure a competitive advantage on top of reducing emissions; attention is needed however to avoid imposing excessive burdens on EU operations which could compromise the EU role as a 'global aviation hub'. Airport capacity needs to be optimised and, where necessary, increased to face growing demand for travel to and from third countries and areas of Europe otherwise poorly connected, which could result in a more than doubling of EU air transport activities by 2050. In other cases, (high-speed) rail should absorb much medium-distance traffic. The EU aviation industry should become a front-runner in the use of low-carbon fuels to reach the 2050 target.
29. In maritime, the need for a global level playing field is equally pronounced⁽⁸⁾. The EU should strive — in cooperation with IMO and other international organisations — for the universal application and enforcement of high standards of safety, security, environmental protection and working conditions, and for eliminating piracy. The environmental record of shipping can and must be improved by both technology and better fuels and operations: overall, the EU CO₂ emissions from maritime transport should be cut by 40% (if feasible 50%) by 2050 compared to 2005 levels.

2.4. Clean urban transport and commuting

30. In cities, switching to cleaner transport is facilitated by the lower requirements for vehicle range and higher population density. Public transport choices are more widely available, as well as the option of walking and cycling. Cities suffer most from congestion, poor air quality and noise exposure. Urban transport is responsible for about a quarter of CO₂ emissions from transport, and 69% of road accidents occur in cities. The gradual phasing out of 'conventionally fuelled'⁽⁹⁾ vehicles from the urban environment is a major contribution to significant reduction of oil dependence, greenhouse gas emissions and local air and noise pollution. It will have to be complemented by the development of appropriate fuelling/charging infrastructure for new vehicles.
31. A higher share of travel by collective transport, combined with minimum service obligations, will allow for increasing the density and frequency of service, thereby generating a virtuous circle for public transport modes. Demand management and land-use planning can lower traffic volumes. Facilitating walking and cycling should become an integral part of urban mobility and infrastructure design.
32. The use of smaller, lighter and more specialised road passenger vehicles must be encouraged. Large fleets of urban buses, taxis and delivery vans are particularly suitable for the introduction of alternative propulsion systems and fuels. These could make a substantial contribution in reducing the carbon intensity of urban transport while providing a test bed for new technologies and opportunity for early market deployment. Road pricing and the removal of distortions in taxation can also assist in encouraging the use of public transport and the gradual introduction of alternative propulsion.
33. The interface between long-distance and last-mile freight transport should be organised more efficiently. The aim is to limit individual deliveries, the most 'inefficient' part of the journey, to the shortest possible route. The use of intelligent transport systems contributes to real-time traffic management, reducing delivery times and congestion for last-mile distribution. This could be performed with low-emission urban trucks. The use of electric, hydrogen and hybrid technologies would not only reduce air emissions, but also noise, allowing a greater portion of freight transport within the urban areas to take place at night time. This would ease the problem of road congestion during morning and afternoon peak hours.

⁽⁸⁾ The EU has developed an integrated maritime policy which puts maritime transport in a wider context of governance, competitiveness and regional strategies (see COM(2009) 540).

⁽⁹⁾ The term 'conventionally fuelled' refers to vehicles using non-hybrid, internal combustion engines (ICEs).

2.5. Ten goals for a competitive and resource-efficient transport system: benchmarks for achieving the 60 % GHG emission reduction target

Developing and deploying new and sustainable fuels and propulsion systems

1. Halve the use of 'conventionally fuelled' cars in urban transport by 2030; phase them out in cities by 2050; achieve essentially CO₂-free city logistics in major urban centres by 2030 ⁽¹⁰⁾.
2. Low-carbon sustainable fuels in aviation to reach 40 % by 2050; also by 2050 reduce EU CO₂ emissions from maritime bunker fuels by 40 % (if feasible 50 %) ⁽¹¹⁾.

Optimising the performance of multimodal logistic chains, including by making greater use of more energy-efficient modes

3. Thirty per cent of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50 % by 2050, facilitated by efficient and green freight corridors. To meet this goal will also require appropriate infrastructure to be developed.
4. By 2050, complete a European high-speed rail network. Triple the length of the existing high-speed rail network by 2030 and maintain a dense railway network in all Member States. By 2050 the majority of medium-distance passenger transport should go by rail.
5. A fully functional and EU-wide multimodal TEN-T 'core network' by 2030, with a high-quality and capacity network by 2050 and a corresponding set of information services.
6. By 2050, connect all core network airports to the rail network, preferably high-speed; ensure that all core seaports are sufficiently connected to the rail freight and, where possible, inland waterway system.

Increasing the efficiency of transport and of infrastructure use with information systems and market-based incentives

7. Deployment of the modernised air traffic management infrastructure (SESAR) ⁽¹²⁾ in Europe by 2020 and completion of the European common aviation area. Deployment of equivalent land and waterborne transport management systems (ERTMS) ⁽¹³⁾, (ITS) ⁽¹⁴⁾, (SSN and LRIT) ⁽¹⁵⁾, (RIS) ⁽¹⁶⁾. Deployment of the European global navigation satellite system (Galileo).
8. By 2020, establish the framework for a European multimodal transport information, management and payment system.
9. By 2050, move close to zero fatalities in road transport. In line with this goal, the EU aims at halving road casualties by 2020. Make sure that the EU is a world leader in safety and security of transport in all modes of transport.
10. Move towards full application of 'user pays' and 'polluter pays' principles and private sector engagement to eliminate distortions, including harmful subsidies, generate revenues and ensure financing for future transport investments.

⁽¹⁰⁾ This would also substantially reduce other harmful emissions.

⁽¹¹⁾ See the Commission communication 'A roadmap for moving to a competitive low carbon economy in 2050' (COM(2011) 112).

⁽¹²⁾ In accordance with the European ATM master plan (http://ec.europa.eu/transport/air/sesar/deployment_en.htm).

⁽¹³⁾ In accordance with the European deployment plan for ERTMS (see Commission Decision C(2009) 561).

⁽¹⁴⁾ In accordance with the EasyWay 2 implementation plan (see Commission Decision C(2010) 9675).

⁽¹⁵⁾ Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system (OJ L 208, 5.8.2002, pp. 10–27).

as amended by Directive 2009/17/EC (OJ L 131, 28.5.2009, pp. 101–113).

⁽¹⁶⁾ See Directive 2005/44/EC (OJ L 225, 30.9.2005, pp. 152–159).



3. THE STRATEGY — WHAT NEEDS TO BE DONE

10

34. Implementing the above vision requires an efficient framework for transport users and operators, an early deployment of new technologies and the development of adequate infrastructure.

> Obstacles to a smooth functioning of and effective competition in the internal market persist. The objective for the next decade is to create a genuine single European transport area by eliminating all residual barriers between modes and national systems, easing the process of integration and facilitating the emergence of multinational and multimodal operators. A vigilant enforcement of the competition rules across all transport modes will complement the Commission's actions in this area. A higher degree of convergence and enforcement of social, safety, security and environmental rules, minimum service standards and users' rights must be an integral part of this strategy, in order to avoid tensions and distortions.

> Innovation is essential for this strategy⁽¹⁷⁾. EU research needs to address the full cycle of research, innovation and deployment in an integrated way through focusing on the most promising technologies and bringing

together all actors involved⁽¹⁸⁾. Innovation can also play a role in promoting more sustainable behaviour.

> The efforts towards a more competitive and sustainable transport system need to include a reflection on the required characteristics of the network and must foresee adequate investments: EU transport infrastructure policy needs a common vision and sufficient resources. The costs of transport should be reflected in its price in an undistorted way.

35. A list of initiatives foreseen is provided in the annex to this communication, the Commission working document that accompanies the communication provides further details.

3.1. A single European transport area

36. A single European transport area should ease the movements of citizens and freight, reduce costs and enhance the sustainability of European transport. The single European sky needs to be implemented as foreseen, and already in 2011 the Commission will address the capacity and quality of airports. The area

⁽¹⁷⁾ See the Commission communication 'Innovation Union' (COM(2010) 546) and Commission communication 'A digital agenda for Europe' (COM(2010) 245).

⁽¹⁸⁾ As regards clean and efficient vehicles, policy will be guided by Commission communication 'A European strategy on clean and energy efficient vehicles' (COM(2010) 186), which sets out a technologically neutral approach between alternative fuels for internal combustion engines, electric and hydrogen fuel cell vehicles.

where bottlenecks are still most evident is the internal market for rail services, which must be completed as a priority in order to achieve a single European railway area. This includes the abolishment of technical, administrative and legal obstacles which still impede entry to national railway markets. A further integration of the road freight market will render road transport more efficient and competitive. For maritime transport, a 'blue belt' in the seas around Europe shall simplify the formalities for ships travelling between EU ports, and a suitable framework must be established to take care of European tasks for inland waterway transport. Market access to ports needs to be further improved.

37. Market opening needs to go hand in hand with quality jobs and working conditions, as human resources are a crucial component of any high-quality transport system. It is also widely known that labour and skill shortages will become a serious concern for transport in the future. It will be important to align the competitiveness and the social agenda, building on social dialogue, in order to prevent social conflicts, which have proved to cause significant economic losses in a number of sectors, most importantly aviation.
38. Transport security is high on the EU's agenda. The EU's comprehensive approach of policy, legislation and monitoring of air and maritime transport security should be further consolidated and strengthened through cooperation with major international partners. For passenger security, screening methods need to be improved in order to ensure high security levels with minimum hassle. A risk-based approach to the security of cargo originating outside the EU should be considered. There is also a need to find an appropriate European approach to land transport security in those areas where EU action has an added value.
39. Setting the framework for safe transport is essential for the European citizen. A European strategy for civil aviation safety will be developed, which includes adaptation to new technologies and, obviously, international cooperation with main partners. In maritime transport, passenger ship safety needs to be proactively addressed. The vessel traffic monitoring and information system SafeSeaNet will become the core of all relevant maritime information tools supporting maritime transport safety and security, as well as the



protection of the environment from ship-source pollution. It will thus provide the essential contribution to the establishment of a common information-sharing environment for the surveillance of the EU maritime domain⁽¹⁹⁾ and support the creation of a common maritime space. For rail transport, the harmonisation and supervision of safety certification are essential in a single European railway area. In these three transport sectors, the European aviation, maritime and rail safety agencies which were set up in the last decade play an indispensable role.

40. Even though the number of road fatalities in the EU was almost halved in the past decade, 34 500 people were killed on EU roads in 2009. Initiatives in the area of technology, enforcement, education and particular attention to vulnerable road users will be key to drastically reduce these losses of life even further.
41. The quality, accessibility and reliability of transport services will gain increasing importance in the coming years, inter alia due to the ageing of the population and the need to promote public transport. Attractive frequencies, comfort, easy access, reliability of services and intermodal integration are the main characteristics

of service quality. The availability of information over travelling time and routing alternatives is equally relevant to ensure seamless door-to-door mobility, both for passengers and for freight.

42. The EU has already established a comprehensive set of passengers' rights which will be further consolidated. Following the ash cloud crisis and the experience of extreme weather events in 2010, it has become evident that mobility continuity plans may be required to preserve the mobility of passengers and goods in a crisis situation. These events also demonstrated the need for the increased resilience of the transport system through scenario development and disaster planning.

3.2. Innovating for the future — technology and behaviour

A European transport research, innovation and deployment strategy

43. 'Growing out of oil' will not be possible relying on a single technological solution. It requires a new concept of mobility, supported by a cluster of new technologies as well as more sustainable behaviour.
44. Technological innovation can achieve a faster and cheaper transition to a more efficient and sustainable European transport system by acting on three main factors: vehicles' efficiency through new engines, materials and design; cleaner energy use through new fuels and propulsion systems; better use of network and safer and more secure operations through information and communication systems. The synergies with other sustainability objectives such as the reduction of oil dependence, the competitiveness of Europe's automotive industry as well as health benefits, especially improved air quality in cities, make a compelling case for the EU to step up its efforts to accelerate the development and early deployment of clean vehicles.
45. Transport research and innovation policy should increasingly support in a coherent way the development and deployment of the key technologies needed to develop the EU transport system into a modern, efficient and user-friendly system. To be more effective, technological research needs to be complemented with a systems approach, taking care of infrastructure and regulatory requirements, coordination of multiple actors and large demonstration projects to encourage market take-up. The Commission will devise an innovation and deployment strategy for the transport sector, in close cooperation with the strategic energy technology plan



⁽¹⁹⁾ COM(2009) 538 and COM(2010) 584.



(SET-plan), identifying appropriate governance and financing instruments, in order to ensure a rapid deployment of research results.

46. This will also concern the deployment of smart mobility systems developed through EU-funded research, such as the air traffic management system of the future (SESAR), the European rail traffic management system (ERTMS) and rail information systems, maritime surveillance systems (SafeSeaNet), river information services (RIS), intelligent transport systems (ITS) and interoperable interconnected solutions for the next generation of multimodal transport management and information systems (including for charging). It will also require an investment plan for new navigation, traffic monitoring and communication services. Of equal importance is research and innovation in the field of vehicle propulsion technologies and alternative fuels (green car initiative, clean sky).
47. Innovation and deployment need to be supported by regulatory framework conditions. Protection of privacy and personal data will have to develop in parallel with

the wider use of information technology tools. Standardisation and interoperability requirements, including at international level, will avoid technological fragmentation and enable European businesses to fully benefit from the entire European transport market, and to create worldwide market opportunities.

Innovative mobility patterns

48. New mobility concepts cannot be imposed. To promote more sustainable behaviour, better mobility planning has to be actively encouraged. Information on all modes of transport, both for travel and freight, on possibilities for their combined use and on their environmental impact, will need to be widely available. Smart intermodal ticketing, with common EU standards that respect EU competition rules is vital. This relates not only to passenger transport but also freight, where better electronic route planning across modes, an adapted legal environment (intermodal freight documentation, insurance, liability) and real-time delivery information also for smaller consignments is needed. ICT has also

the potential for satisfying certain accessibility needs without additional mobility.

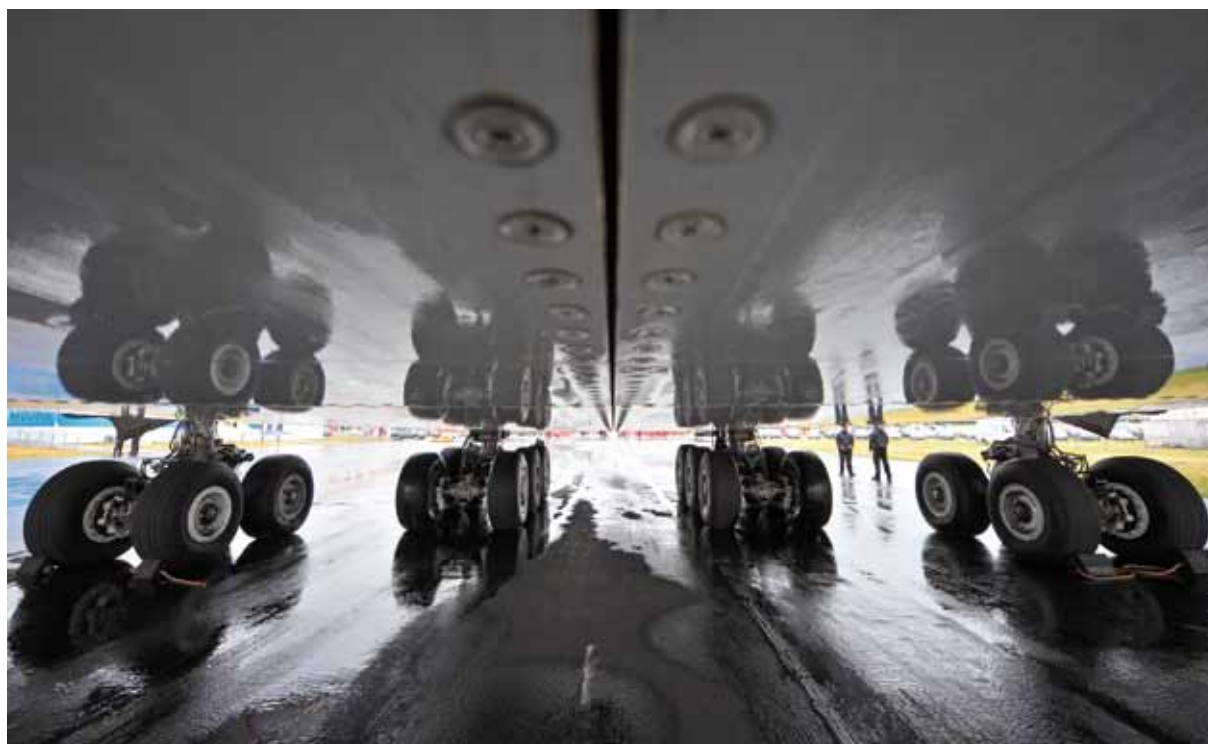
49. In the urban context, a mixed strategy involving land-use planning, pricing schemes, efficient public transport services and infrastructure for non-motorised modes and charging/refuelling of clean vehicles is needed to reduce congestion and emissions. Cities above a certain size should be encouraged to develop urban mobility plans, bringing all those elements together. Urban mobility plans should be fully aligned with integrated urban development plans. An EU-wide framework will be needed in order to make interurban and urban road user charging schemes interoperable.

3.3. Modern infrastructure, smart pricing and funding

A European mobility network

50. Europe needs a 'core network' of corridors, carrying large and consolidated volumes of freight and passengers traffic with high efficiency and low emissions, thanks to the extensive use of more efficient modes in multimodal combinations and the wide application of advanced technologies and supply infrastructure for clean fuels.
51. Despite EU enlargement, large divergences in terms of transport infrastructure remain between eastern and western parts of the EU, which need to be tackled. The European continent needs to be united also in terms of infrastructure.
52. Within this core network, information technology tools should be widely deployed to simplify administrative procedures, provide for cargo tracking and tracing, and optimise schedules and traffic flows (e-Freight). Their uptake should be encouraged by requiring their deployment on TEN-T infrastructure and a gradual integration of modal systems.
53. The core network must ensure efficient multimodal links between the EU capitals and other main cities, ports, airports and key land border crossings, as well as other main economic centres. It should focus on the completion of missing links — mainly cross-border sections and bottlenecks/bypasses — on the upgrading of existing infrastructure and on the development of





multimodal terminals at sea and river ports and on city logistic consolidation centres. Better rail/airport connections must be devised for long-distance travel. The 'motorways of the sea' will be the maritime dimension of the core network.

54. The selection of projects eligible for EU funding must reflect this vision and put greater emphasis on European added value. Co-funded projects should equally reflect the need for infrastructure that minimises the impact on the environment, that is resilient to the possible impact of climate change and that improves the safety and security of users.
55. A well-performing transport network requires substantial resources. The cost of EU infrastructure development to match the demand for transport has been estimated at over EUR 1.5 trillion for 2010–30. The completion of the TEN-T network requires about EUR 550 billion until 2020 out of which some EUR 215 billion can be referred to the removal of the main bottlenecks. This does not include investment in vehicles, equipment and charging infrastructure which may require an additional trillion to achieve the emission reduction goals for the transport system.
56. Diversified sources of finance both from public and private sources are required. Better coordination of the Cohesion and Structural Funds with transport policy objectives is needed, and Member States need to ensure

that sufficient national funding is available in their budgetary planning, as well as sufficient project planning and implementation capacities. Other sources of funding to be considered include schemes for the internalisation of external costs and infrastructure-use charges⁽²⁰⁾, which could create additional revenue streams making infrastructure investments more attractive to private capital.

57. Unlocking the potential of private finances equally requires an improved regulatory framework and innovative financial instruments. Project assessment and authorisation must be carried out in an efficient and transparent manner that limits time, cost and uncertainty. New financing instruments, for example the EU project bonds⁽²¹⁾ initiative, can support private–public partnerships (PPPs) financing on a bigger scale.

Getting prices right and avoiding distortions

58. Price signals play a crucial role in many decisions that have long-lasting effects on the transport system. Transport charges and taxes must be restructured in the direction of wider application of the 'polluter pays'

⁽²⁰⁾ In its communication 'Strategy for the internalisation of external costs' (SEC(2008) 2207, accompanying COM(2008)435), the Commission has laid down a common methodology to charge all external costs across the whole transport sector.

⁽²¹⁾ COM(2010) 700.



and 'user pays' principles. They should underpin transport's role in promoting European competitiveness and cohesion objectives, while the overall burden for the sector should reflect the total costs of transport including infrastructure and external costs. Wider socioeconomic benefits and positive externalities justify some level of public funding but, in the future, transport users are likely to pay for a higher proportion of the costs than today. It is important that correct and consistent monetary incentives are given to users, operators and investors.

59. The internalisation of externalities, the elimination of tax distortions and unjustified subsidies and free and undistorted competition are therefore part of the effort to align market choices with sustainability needs (and to reflect the economic costs of 'non-sustainability'). They are also necessary to establish a level playing field between modes which are in direct competition.
60. As regards GHG emissions, two main market-based instruments are being used: energy taxation and emission trading systems. Taxation is currently applied to fuels used in land transport, while the ETS applies to electricity use and, as of 2012, to aviation. The revision of the energy taxation directive will be an opportunity to ensure better coherence between the two instruments.

At the same time, the EU urges a decision in IMO on a global instrument to be applied to maritime transport, where climate change costs are currently not internalised⁽²²⁾.

61. The cost of local externalities such as noise, air pollution and congestion could be internalised through charging for the use of infrastructure. The Commission's recent proposal to amend the so-called 'Eurovignette directive' represents a first step towards a higher degree of internalisation of costs generated by heavy goods vehicles, but disparities in national road charging policies will remain. Further action will examine the gradual phasing in of a mandatory harmonised internalisation system for commercial vehicles on the entire interurban network, putting an end to the current situation whereby international hauliers need the Eurovignette, five national vignettes and eight different tags and tolling contracts to drive unhindered on Europe's tolled roads.
62. For passenger cars, road charges are increasingly considered as an alternative way to generate revenue and influence traffic and travel behaviour. The Commission will develop guidelines for the application of internalisation charges to all vehicles and for all main externalities. The long-term goal is to apply user charges

⁽²²⁾ See also Directive 2009/29/EC (OJ L 140, 5.6.2009, pp. 63–87), recital 3.

to all vehicles and on the whole network to reflect at least the maintenance cost of infrastructure, congestion, air and noise pollution.

63. In parallel, and before 2020, the Commission will develop a common approach for the internalisation of noise and local pollution costs on the whole rail network.
64. Many branches of transport are treated favourably in terms of taxation, in comparison to the rest of the economy: tax treatment of company cars, VAT and energy tax exemptions on international sea and air transport, etc. Generally, these arrangements provide conflicting incentives with respect to the efforts to improve the efficiency of the transport system and reduce its external costs. The Commission will examine proposals to achieve greater consistency between the various elements of transport taxation and to encourage the rapid introduction of clean vehicles.

3.4. The external dimension

65. Transport is fundamentally international. Because of this, most actions in the roadmap are linked to challenges related to the development of transport beyond the EU borders. Opening up third-country markets in transport services, products and investments continues to have high priority. Transport is therefore included in all our trade negotiations (WTO, regional and bilateral). Flexible strategies will be adopted to ensure the EU's role as a standard setter in the transport field.
66. To that end, the Commission will focus on the following areas of actions.
 - > Extend internal market rules through work in international organisations (ICAO, IMO, OTIF, OSJD, UNECE, the international river commissions, etc.) and where relevant attain full EU membership. Promote European safety, security, privacy and environmental standards worldwide through bilateral and multilateral cooperation. Reinforce the transport dialogue with main partners.
 - > Extend our transport and infrastructure policy to our immediate neighbours, including in the preparation of mobility continuity plans, to deliver closer market integration⁽²³⁾. A cooperation framework similar to

on the Western Balkan Transport Treaty could be used to extend EU rules to other neighbouring countries. Complete the European common aviation area of 58 countries and 1 billion inhabitants⁽²⁴⁾. Cooperate with the Mediterranean partners in the implementation of a Mediterranean maritime strategy to enhance maritime safety, security and surveillance⁽²⁵⁾. Promote SESAR, ERTMS and ITS technology deployment in the world, and establish research and innovation partnerships also at international level.

- > Promote our approach globally: opening up transport markets to free and undistorted competition and environmentally sustainable solutions. Continue to aim at greater market access in transport in all relevant international negotiations.

⁽²³⁾ See also the Commission communication 'Partnership between the European Union and Africa' (COM(2009) 301).

⁽²⁴⁾ This includes the Euro-Mediterranean aviation area (see the Commission communication 'A partnership for democracy and prosperity with the southern Mediterranean' (COM(2011) 200)), but also other neighbourhood countries.

⁽²⁵⁾ See COM(2011) 200.



4. CONCLUSION

18

67. A transformation of the European transport system will only be possible through a combination of manifold initiatives at all levels. The various actions and measures indicated in this roadmap will be further elaborated. The Commission will prepare appropriate legislative proposals in the next decade with key initiatives to be put forward during the current mandate. Each of its proposals will be preceded by a thorough impact assessment, considering EU added value and subsidiarity aspects. The Commission will ensure its actions increase the competitiveness of transport while delivering the minimum 60 % reduction of GHG emissions from transport needed by 2050, orienting itself along the 10 goals which should be seen as benchmarks.
68. The Commission invites the European Parliament and the Council to endorse this 'Roadmap to a single European transport area — Towards a competitive and resource-efficient transport system' and the attached list of actions.

Annex: List of initiatives

1. AN EFFICIENT AND INTEGRATED MOBILITY SYSTEM

1.1. A single European transport area

1. A true internal market for rail services

- Open the domestic rail passengers market to competition, including mandatory award of public service contracts under competitive tendering.
- Achieve a single vehicle type authorisation and a single railway undertaking safety certification by reinforcing the role of the European Railway Agency (ERA).
- Develop an integrated approach to freight corridor management, including track access charges.
- Ensure effective and non-discriminatory access to rail infrastructure, including rail-related services, in particular through structural separation between infrastructure management and service provision ⁽²⁶⁾.

2. Completion of the single European sky

- Achieve a truly seamless single European sky and deploy the future air traffic management system (SESAR) in the agreed time frame.
- Establish the appropriate legal and financial framework to support the single European sky policy, consolidate the relationship between the European Union and Eurocontrol.

3. Capacity and quality of airports

- Revise the slot regulation to favour more efficient use of airport capacity.
- Clarify and improve conditions to enter and provide quality services, including ground handling; ensure that all actors in an airport system meet minimum quality standards.
- Airport capacity — develop an approach to deal with future capacity problems including better integration with the railway network.

4. A maritime 'blue belt' and market access to ports

The European maritime transport space without barriers should be further developed into a 'blue belt' of free maritime movement in and around Europe, and waterborne transport should be used to its full potential.

- Integrate the use of monitoring tools by all relevant authorities, ensure the full interoperability between ICT systems in the waterborne sectors, guarantee the monitoring of vessels and freight (blue belt) and set up appropriate port facilities ('blue lanes').
- Establish a framework for the granting of pilot exemption certificates in EU ports.
- Review restrictions on provision for port services.
- Enhance the transparency on ports' financing, clarifying the destination of public funding to the different port activities, with a view to avoid any distortion of competition.

5. A suitable framework for inland navigation

- Establish an appropriate framework to optimise the internal market for inland waterway transport, and to remove barriers that prevent its increased use. Assess and define the necessary tasks and mechanisms for their execution, also with a view to the wider European context.

⁽²⁶⁾ The preferred options for unbundling should ensure the development of competition, continued investment and efficiency in the cost of service provision.

6. Road freight

- Review the market situation of road freight transport as well as the degree of convergence on, among others, road user charges, social and safety legislation, transposition and enforcement of legislation in the Member States, with a view to further opening road transport markets. In particular, the elimination of remaining restrictions on cabotage should be pursued.
- Review the rules on the tachograph to make it more cost-effective, give access to the EU register on road transport undertakings to police and enforcement officers when they carry out roadside checks; harmonise sanctions for infringement to EU rules on professional transport; harmonise training of enforcement officers.
- Adapt the legislation on weight and dimension to new circumstances, technologies and needs (e.g. weight of batteries, better aerodynamic performance), and to make sure it facilitates intermodal transport and the reduction of overall energy consumption and emissions.

7. Multimodal transport of goods: e-Freight

Create the appropriate framework to allow for tracing goods in real time, ensure intermodal liability and promote clean freight transport:

- Put in practice the concepts of 'single window' and 'one-stop administrative shop'; by creating and deploying a single transport document in electronic form (electronic waybill), and creating the appropriate framework for the deployment of tracking and tracing technologies (RFID, etc.).
- Ensure that liability regimes promote rail, waterborne and intermodal transport.

1.2. Promoting quality jobs and working conditions

8. Social code for mobile road transport workers

- Encourage and support the dialogue between social partners in view of an agreement on a social code for mobile road transport workers, addressing also the problem of disguised self-employment.

9. A social agenda for maritime transport

- Implement the measures identified for action in the maritime social agenda, following up to the Commission's strategic goals and recommendations for the EU's maritime transport policy until 2018.
- Enhance the enforcement of the Maritime Labour Convention (MLC) of the International Labour Organisation (ILO) with regard to flag states, port states and labour supplying states.
- Include all or part of the currently excluded seagoing workers within the scope of several EU labour law directives or grant them an equivalent level of protection by other means.
- Update the seafarers training directive (2008/106/EC) following a revision of the International Maritime Organisation (IMO) Convention on the Training and the Certification of Seafarers (STCW Convention). Establish a mutually recognisable framework on the training of port workers in different fields of port activities.

10. A socially responsible aviation sector

- Establish a mechanism to analyse the impact of regulatory developments on working conditions in the air transport sector.
- Establish Europe-wide minimum service and quality standards for workers in the whole aviation value chain (including ATM and ground handling). Encourage the European social partners to address the issue of prevention of conflicts and of disturbance of minimum service in the whole aviation value chain.

11. An evaluation of the EU approach to jobs and working conditions across transport modes

- Conduct an appraisal of the sectoral social dialogue processes taking place in the various segments of the transport sector to the end of improving social dialogue and facilitating its effectiveness.
- Ensure employee involvement, in particular through European works councils, in transnational companies in the sector.
- Address quality of work in all transport modes, with respect to, notably, training, certification, working conditions and career development, with a view to creating quality jobs, developing the necessary skills and strengthening the competitiveness of EU transport operators.

1.3. Secure transport**12. Cargo security**

- Implement the action plan on strengthening air cargo security, define new rules on air cargo screening as necessary and enhanced security of cargo in ports.
- Complete an EU-wide one-stop security system for air cargo.

13. High levels of passenger security with minimum hassle

Promote improved screening methods, fully respecting fundamental rights; such methods should underpin development of a 'checkpoint of the future' — such as security corridors which would allow a high number of passengers being controlled with minimum hassle and intrusion. They should also support security provision in other vulnerable areas such as major transport interchanges.

- Promote, also through funding, the development of more effective and privacy-friendly technologies (scanners, detectors of new explosives, smart chips, etc.) as well as more privacy-friendly solutions in existing technologies.
- Define common detection performance standards and certifications procedures for detection equipment.

14. Land transport security

- Work with Member States on the security of land transport, establishing as a first step a permanent expert group on land transport security and introducing further measures where EU action has added value. Special focus will be put on urban security issues.

15. 'End-to-end' security

- Increase the level of security along the supply chain without impeding the free flow of trade. 'End-to-end' security certificates should be considered taking into account existing schemes.
- Joint security assessment covering all modes of transport.
- Integrate potential effects of terrorist and criminal attacks in the preparation of mobility continuity plans (cf. Initiative 23)
- Pursue international cooperation in the fight against terrorism and other criminal activities like piracy. The external dimension (cf. Initiative 40) is crucial.

1.4. Acting on transport safety: saving thousands of lives

16. Towards a 'zero-vision' on road safety

- Harmonise and deploy road safety technology — such as driver assistance systems, (smart) speed limiters, seat belt reminders, eCall, cooperative systems and vehicle-infrastructure interfaces — as well as improved roadworthiness tests including for alternative propulsion systems.
- Develop a comprehensive strategy of action on road injuries and emergency services, including common definitions and standard classifications of injuries and fatalities, in view of adopting an injuries reduction target.
- Focus on training and education of all users; promote the use of safety equipment (seat belts, protective clothes, anti-tampering).
- Pay particular attention to vulnerable users such as pedestrians, cyclists and motorcyclists, including through safer infrastructure and vehicle technologies.

17. A European strategy for civil aviation safety

European aviation safety is high but not the best in the world. Our aim should be to become the safest region for aviation. In order to do so, we will develop a comprehensive European aviation safety strategy, building on the work of the European Aviation Safety Agency (EASA), which includes the following aspects.

- Improve the collection, quality, exchange and analysis of data by reviewing legislation on occurrence reporting in civil aviation.
- Adapt the regulatory safety framework to the development of new technologies (SESAR).
- Ensure the implementation of the EU aviation safety strategy consistently across all aviation domains.
- Promote transparency and exchange of safety information with ICAO and other international aviation partners, in particular in the framework of the global safety information exchange initiative; cooperate with non-EU countries, in particular the USA, on safety matters on regulatory convergence, mutual recognition and technical assistance.
- Develop a safety management system at EU level that incorporates safety performance targets and measurements in order to identify the risks and to achieve continued improvement in safety levels.

18. Safer shipping

- Work with the European Maritime Safety Agency (EMSA) to modernise passenger ship safety legislation.
- Develop SafeSeaNet into the core system for all relevant maritime information tools needed to support maritime safety and security and the protection of the marine environment from ship-source pollution.
- Assess the feasibility of the creation of an EU register and EU flag for maritime and inland waterway transport. In essence, the EU sign would represent a quality label certifying safe, secure, environmentally friendly ships manned by highly qualified professionals.
- Assess the feasibility of shared functions for coastguards in the EU, in particular to ensure maritime safety, security and environmental protection.

19. Rail safety

- Progressively achieve a sector-wide approach to safety certification in the rail transport sector, building on existing approaches for infrastructure managers and railways undertakings and evaluating the possibility to rely on a European standard.
- Enhance the role of ERA in the field of rail safety, in particular its supervision on national safety measures taken by national safety authorities and their progressive harmonisation.
- Enhance the certification and maintenance process for safety critical components used to build rolling stocks and railway infrastructures.

20. Transport of dangerous goods

- Streamline the rules for the intermodal transport of dangerous goods to ensure interoperability between the different modes.

1.5. Service quality and reliability**21. Passengers' rights**

- Develop a uniform interpretation of EU law on passenger rights and a harmonised and effective enforcement, to ensure both a level playing field for the industry and a European standard of protection for the citizens.
- Assemble common principles applicable to passengers' rights in all transport modes (charter of basic rights), notably the 'right to be informed', and further clarify existing rights. At a later stage, consider the adoption of a single EU framework regulation covering passenger rights for all modes of transport (EU Codex).
- Improve the quality of transport for elderly people, passengers with reduced mobility and for disabled passengers, including better accessibility of infrastructure.
- Complete the established legislative framework on passenger rights with measures covering passengers on multimodal journeys with integrated tickets under a single purchase contract as well as in the event of a transport operator's bankruptcy.
- Improve the level playing field at international level through the inclusion of care quality standards in bilateral and multilateral agreements for all modes of transport, with a view to further passengers' rights also in the international context.

22. Seamless door-to-door mobility

- Define the measures necessary for further integrating different passenger transport modes to provide seamless multimodal door-to-door travel.
- Create the framework conditions to promote the development and use of intelligent systems for interoperable and multimodal scheduling, information, online reservation systems and smart ticketing. This could include a legislative proposal to ensure access of private service providers to travel and real-time traffic information.

23. Mobility continuity plans

- Ensure the definition of mobility plans to ensure service continuity in case of disruptive events. The plans should address the issue of prioritisation in the use of working facilities, the cooperation of infrastructure managers, operators, national authorities and neighbouring countries, and the temporary adoption or relaxation of specific rules.

2. INNOVATING FOR THE FUTURE: TECHNOLOGY AND BEHAVIOUR

2.1. A European transport research and innovation policy

24. A technology roadmap

Fragmentation of research and development efforts in Europe is most harmful, and joint European efforts will bring the greatest European added value in areas such as:

- clean, safe and silent vehicles for all different modes of transport, from road vehicles to ships, barges, rolling stock in rail and aircraft (including new materials, new propulsion systems and the IT and management tools to manage and integrate complex transport systems);
- technologies to improve transport security and safety;
- potential new or unconventional transport systems and vehicles such as unmanned aircraft systems, unconventional systems for goods distribution;
- a sustainable alternative fuels strategy including also the appropriate infrastructure;
- integrated transport management and information systems, facilitating smart mobility services, traffic management for improved use of infrastructure and vehicles, and real-time information systems to track and trace freight and to manage freight flows; passenger/travel information, booking and payment systems;
- intelligent infrastructure (both land and space-based) to ensure maximum monitoring and interoperability of the different forms of transport and communication between infrastructure and vehicles;
- innovations for sustainable urban mobility following up the Civitas programme and initiatives on urban road pricing and access restriction schemes.

24

25. An innovation and deployment strategy

Identify the necessary innovation strategies including the appropriate governance and the financing instruments in order to ensure a rapid deployment of results developed in the research process. Examples are:

- deployment of smart mobility systems such as the air traffic management system of the future (SESAR), the European rail traffic management system (ERTMS) and rail information systems, maritime surveillance systems (SafeSeaNet), river information services (RIS), ITS, and the next generation of multimodal traffic management and information systems;
- definition and deployment of an open standard electronic platform for vehicle onboard units, performing various functions including road charging;
- development of a plan for investment in new navigation, traffic monitoring and communication services to allow for the integration of information flows, management systems and mobility services based on a European integrated multimodal information and management plan; demonstration projects for electro mobility (and other alternative fuels) including recharging and refuelling infrastructure and intelligent transport systems focusing in particular on those urban areas where air quality levels are frequently exceeded;
- smart mobility partnerships and demonstration projects for sustainable urban transport solutions (including demonstrators for road pricing schemes etc.);
- measures to promote increased replacement rate of inefficient and polluting vehicles.

26. A regulatory framework for innovative transport

Identify the necessary regulatory framework conditions through standardisation or regulation:

- appropriate standards for CO₂ emissions of vehicles in all modes, where necessary supplemented by requirements on energy efficiency to address all types of propulsion systems;

- vehicle standards for noise emission levels;
- ensure that CO₂ and pollutant emissions are reduced under real-world driving conditions by proposing at the latest by 2013 a revised test cycle to measure emissions;
- public procurement strategies to ensure rapid uptake of new technologies;
- rules on the interoperability of charging infrastructure for clean vehicles;
- guidelines and standards for refuelling infrastructures;
- interface standards for infrastructure-to-infrastructure, vehicle-to-infrastructure and vehicle-to-vehicle communications;
- access conditions to transport data for safety and security purposes;
- specifications and conditions for transport-related smart charging and payment systems;
- better implementation of existing rules and standards.

2.2. Promoting more sustainable behaviour

27. Travel information

- Promote awareness of the availability of alternatives to individual conventional transport (drive less, walk and cycle, car sharing, park and ride, intelligent ticketing, etc.)

28. Vehicle labelling for CO₂ emissions and fuel efficiency

- Review the labelling directive to make it more effective. This will, inter alia, consider the extension of the scope to light commercial and L-category vehicles, and the harmonisation of the label and vehicles fuel efficiency classes throughout the Member States.
- Support the market take-up of fuel-efficient, safe and low-noise tyres beyond the performance requirements set in type approval ⁽²⁷⁾.

29. Carbon footprint calculators

- Encourage business-based GHG certification schemes and develop common EU standards in order to estimate the carbon footprint of each passenger and freight journey with versions adapted to different users such as companies and individuals. This will allow better choices and easier marketing of cleaner transport solutions.

30. Eco-driving and speed limits

- Include eco-driving requirements in the future revisions of the driving licence directive and take steps to accelerate the deployment of ITS applications in support of eco-driving. Fuel-saving techniques should also be developed and promoted in other modes — for example continuous descent for aircraft.
- Examine approaches to limit the maximum speed of light commercial road vehicles, in order to decrease energy consumption, to enhance road safety and to ensure a level playing field.

2.3. Integrated urban mobility

31. Urban mobility plans

- Establish procedures and financial support mechanisms at European level for preparing urban mobility audits, as well as urban mobility plans, and set up a European urban mobility scoreboard based on common targets. Examine the possibility of a mandatory approach for cities of a certain size, according to national standards based on EU guidelines.

⁽²⁷⁾ This includes the adoption of all implementing measures of the tyre labelling regulation (EC) No 1222/2009 (OJ L 342, 22.12.2009, pp. 46–67). It would achieve 5 % fuel savings on the total EU fleet by 2020.

- Link regional development and cohesion funds to cities and regions that have submitted a current, and independently validated urban mobility performance and sustainability audit certificate.
- Examine the possibility of a European support framework for a progressive implementation of urban mobility plans in European cities.
- Integrated urban mobility in a possible smart cities innovation partnership.
- Encourage large employers to develop corporate/mobility management plans.

32. An EU framework for urban road user charging

- Develop a validated framework for urban road user charging and access restriction schemes and their applications, including a legal and validated operational and technical framework covering vehicle and infrastructure applications.

33. A strategy for near-‘zero-emission urban logistics’ 2030

- Produce best-practice guidelines to better monitor and manage urban freight flows (e.g. consolidation centres, size of vehicles in old centres, regulatory limitations, delivery windows, unused potential of transport by river).
- Define a strategy for moving towards ‘zero-emission urban logistics’, bringing together aspects of land planning, rail and river access, business practices and information, charging and vehicle technology standards.
- Promote joint public procurement for low-emission vehicles in commercial fleets (delivery vans, taxis, buses ...).

3. MODERN INFRASTRUCTURE AND SMART FUNDING

3.1. Transport infrastructure: territorial cohesion and economic growth

34. A core network of strategic European infrastructure — A European mobility network

- Define in new TEN guidelines a core network of strategic European infrastructure integrating the eastern and western part of the European Union and shaping the single European transport area. Foresee appropriate connections with neighbouring countries.
- Concentrate European action on the components of the TEN-T network with the highest European added value (cross-border missing links, intermodal connecting points and key bottlenecks).
- Deploy large-scale intelligent and interoperable technologies (SESAR, ERTMS, RIS, ITS, etc.) to optimise the capacity and the use of infrastructure.
- Ensure that EU-funded transport infrastructure takes into account energy efficiency needs and climate change challenges (climate resilience of the overall infrastructure, refuelling/recharging stations for clean vehicles, choice of construction materials ...).

35. Multimodal freight corridors for sustainable transport networks

- Create, in the context of the ‘core network’, multimodal freight corridor structures to synchronise investments and infrastructure works and support efficient, innovative and multimodal transport services, including rail services over medium and long distances.
- Support multimodal transport and single wagon load business, stimulate the integration of inland waterways into the transport system and promote eco-innovation in freight transport. Support the deployment of new vehicles and vessels and retrofitting.

36. *Ex ante* project evaluation criteria

- Introduce *ex ante* project evaluation criteria ensuring that infrastructure projects duly demonstrate the EU added value or are based on ‘services rendered’ and generate sufficient revenue.

- Streamline procedures for projects of overriding European interest, in order to ensure: (i) reasonable time limits for completing the whole cycle of procedures; (ii) a communication framework that is in line with the project implementation; and (iii) integrated planning which takes environmental issues into account in early stages of the planning procedure.
- Introduce PPP-screening to the *ex ante* evaluation process to ensure that the option of PPP has been carefully analysed before a request for EU funding is being asked.

3.2. A coherent funding framework

37. A new funding framework for transport infrastructure

- Develop an infrastructure funding framework with sufficient conditionality to provide support for the completion of the TEN-T core network as well as other infrastructure programmes, encompassing the investment strategies of both the TEN-T programmes and the Cohesion and Structural Funds, and considering revenues from transport activities.
- Provide EU support for developing and deploying technologies that improve infrastructure use efficiency and decarbonisation (new road network pricing and tolling systems, ITS and capacity improvement programmes).
- Link TEN-T funding to progress towards the completion of the TEN-T core network and on the pooling of national resources along corridors.

38. Private sector engagement

- Establish an enabling framework for the development of PPPs: (i) introduce a formal screening of TEN-T projects to identify those with PPP potential; (ii) create a standardised and predictable PPP procurement process for TEN-T projects over time; and (iii) revise TEN-T regulations accordingly so as to accommodate the PPP procurement process and payment mechanisms.
- In the context of the cooperation framework established between the Commission services and the European Public–Private Partnership Expertise Centre, encourage Member States to use more PPPs, while acknowledging that not all projects are suitable for this mechanism, and provide relevant expertise to Member States.
- Participate in designing new financing instruments for the transport sector, particularly the EU project bond initiative.

3.3. Getting prices right and avoiding distortions

39. Smart pricing and taxation

Phase I (up to 2016)

Transport charges and taxes should be restructured. They should underpin transport's role in promoting European competitiveness, while the overall burden for the sector should reflect the total costs of transport in terms of infrastructure and external costs.

- Revise motor fuel taxation with clear identification of the energy and CO₂ component.
- Phase in a mandatory infrastructure charge for heavy-duty vehicles. The scheme would introduce a common tariff structure and cost components such as the recovery of wear and tear, noise and local pollution costs to replace the existing user charges.
- Evaluate existing car road charging schemes and their compatibility with the EU treaties. Develop guidelines for the application of internalisation charges to road vehicles, covering the social costs of congestion, CO₂ — if not included in fuel tax — local pollution, noise and accidents. Provide incentives to Member States who launch pilot projects for the implementation of schemes along such guidelines.

- Proceed with the internalisation of external costs for all modes of transport, applying common principles while taking into account the specificity of each mode.
- Create a framework for earmarking revenues from transport for the development of an integrated and efficient transport system.
- Issue guidelines providing clarification concerning public funding to the different modes of transport and to transport infrastructure, where necessary.
- Reassess transport taxation where necessary, namely by linking vehicle taxation to environmental performance, reflecting on the possible way forward to review the current VAT system concerning passenger transport, and revising company car taxation to eliminate distortions and favour the deployment of clean vehicles.

Phase II (2016–20)

- Building on Phase I, proceed to the full and mandatory internalisation of external costs (including noise, local pollution and congestion on top of the mandatory recovery of wear and tear costs) for road and rail transport. Internalise costs for local pollution and noise in ports and airports, as well as for air pollution at sea, and examine mandatory application of internalisation charges on all inland waterways on EU territory. Develop market-based measures to further reduce GHG emissions.

4. THE EXTERNAL DIMENSION

40. Transport in the world: the external dimension

Transport is fundamentally international. Because of this, most actions in this White Paper are linked to challenges related to the development of transport beyond the EU borders. Opening up third-country markets in transport services, products and investments continues to have high priority. Transport is therefore included in all our trade negotiations (WTO, regional and bilateral). Flexible strategies will be adopted to ensure the EU's role as a standard setter in the transport field. To that end, the Commission will focus on the following areas of actions.

- Extend internal market rules through work in international organisations (WTO, ICAO, IMO, OTIF, OSJD, UNECE, the international river commissions, etc.) and, where relevant, attain full EU membership. Promote European safety, security, privacy and environmental standards worldwide. Reinforce the transport dialogue with main partners.
- Complete the European common aviation area of 58 countries and 1 billion inhabitants. Conclude comprehensive air services agreement with key economic partners (Brazil, China, India, Russia, South Korea, etc.) and eliminate air transport investment restrictions in third countries. Promote SESAR technology deployment in the world.
- Take action in multilateral forums and bilateral relations to promote policy targeted at the energy efficiency and climate change goals of this White Paper.
- Continuously use multilateral (in ICAO, IMO and WCO) and bilateral layers to tackle the issue of terrorism, envisaging international agreements and enhanced security dialogues with strategic partners, starting with the USA. Cooperate on joint threat assessments, training of third-countries' officers, joint inspections, piracy prevention, etc. Ensure recognition of the EU concept of 'one-stop security' system internationally.
- Develop a cooperation framework to extend our transport and infrastructure policy to our immediate neighbours, to deliver improved infrastructure connections and closer market integration, including in the preparation of mobility continuity plans.
- Cooperate with Mediterranean partners in the implementation of a Mediterranean maritime strategy to enhance maritime safety, security and surveillance.
- Take appropriate steps to advance the removal of exemptions for liner shipping conferences outside the EU.
- Build on established research and innovation partnerships to find common answers to the challenges related to interoperability of transport management systems, sustainable low-carbon fuels, security and safety.

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