

More Rail = Less CO2

UNIFE contribution  
to the discussion on  
The Future of Transport

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## Summary

The European Commission is planning to publish a Communication on the Future of Transport outlining the broad transport policy goals until at least 2030.

With this paper, UNIFE contributes to the ongoing debate about future EU transport policy. We underline the challenges that will face in particular the European railway sector such as globalisation, urbanisation, climate change and a growing scarcity of resources.

As a second step, we briefly take stock of the achievements of European transport policy since the publication of the White Paper on Transport in 2001. We do so by assessing progress in four areas that we deem necessary to enhance the competitiveness of rail and thus its modal share: leveling the playing field between different modes of transport, investing in railway infrastructure and rolling stock, advancing liberalisation of railways and fostering technical harmonisation and standardisation.

On the basis of this assessment and in the light of the challenges to come, UNIFE then proceeds to recommend concrete policy measures in each of these areas in order to enhance rail and make it fit to fulfill its role of the most environmentally friendly mode of transport in the 21<sup>st</sup> century.

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## 1. Introduction

In the coming decades up to 2030 and beyond, the European transport sector is likely to face a set of important challenges that will profoundly affect the European transport system as we know it today. This necessarily also includes the rail transport sector.

In its Focus Group's Report,<sup>1</sup> the European Commission has provided a very detailed overview of what these challenges may look like. Now, it is of utmost importance to determine where the European Union would like to head in its transport policy, and what the transport system of the next decades should come to look like.

Policy decisions on infrastructure investment, taxation or research and development have very long-term effects. Thus, the political choices made in the coming years, are the ones that will to a very large extent influence the situation of the sector, its modal share, emissions and its ability to respond to transport demand in the future. Therefore, while bearing in mind a long-term perspective of where the European Union should head, e.g. the modal shift from road to rail in order to meet the Lisbon target of sustainable economic growth and a 20% reduction of CO<sub>2</sub> emissions by 2020, it is very concrete policy decisions that are needed at present.

This contribution to the Commission's discussion of the future of transport policy aims thus at providing a brief insight to mega-trends that will affect the European transport sector, and the rail sector in particular. It will depict the challenges that will have to be met and draw up some general goals that the transport sector of the future should meet. Then the current achievement of EU transport policy since the 2001 White Paper on Transport will be assessed.<sup>2</sup> Finally, we will propose some very concrete policy measures that should help to move European transport, and rail transport in particular, closer to those goals presented.

Measures will necessarily focus on EU-action, as the international nature of transport requires solutions that go beyond merely local or national measures.

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<sup>1</sup> The Future of Transport, Focus Groups' Report, 20 February 2009.

<sup>2</sup> White Paper: European Transport Policy for 2010: time to decide, COM(2001) 370 final

## 2. Mega-Trends and Challenges in Transport

The coming years and decades will see some developments that will heavily impact European societies and economies. This will have its corresponding effects on the transport and the rail sector in particular.

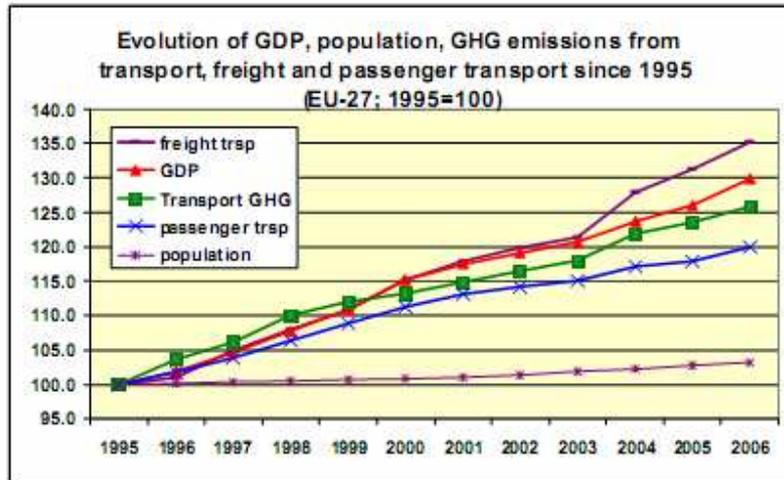
Despite the current economic crisis, the more lasting trend of **globalisation** will not be reversed or even be halted in the long term. This means that cross-border flows of goods and people will increase, triggering a growing and ever more differentiated demand for transport. The rail sector needs to adapt further to this reinforced international nature of transport; not only in terms of interoperability of national railway systems. A better integration of markets, to meet enhanced competition, also from other modes of transport will be necessary. In the light of already existing shortcomings in rail infrastructure, and taking into account the long-term nature of infrastructure investments, a strategic vision for international rail transport will be necessary in order to overcome bottlenecks and to make it more fit to meet this growing demand for passenger and freight transport.

Furthermore, globalisation and an increasing economic specialisation may also lead to a **changed geographic concentration of the population**. Current trends of urbanisation will be enhanced while rural areas are likely to become less populated. This poses questions not only of **urban congestion** and how to solve it, but also of how to meet the mobility demands of a rural population. **Demographic change and the ageing of European populations** may also put into question existing transport solutions. This calls for better and more efficient urban transport systems, as well as transport solutions for short and medium distances.

As if these challenges were not enough in themselves, **climate change and a growing scarcity of resources**, be it of land or energy, need to be considered when trying to overcome any of the above-mentioned challenges. The transport sector accounted for 23.8% of all greenhouse gas (GHG) emissions and for 27.6% of CO<sub>2</sub> emissions in 2006.<sup>3</sup> In the past decade, freight transport has grown faster than the GDP. No other sector has experienced such a high growth rate of emissions as transport between 1990 and 2006.

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<sup>3</sup> Source : EEA.



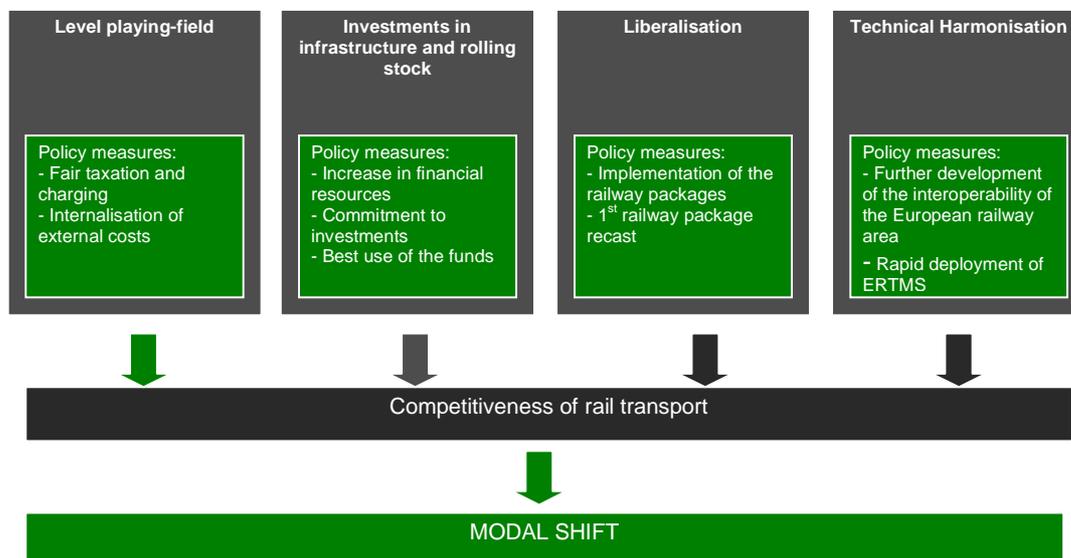
Source: DG TREN (2008), EU energy and transport in figures. Statistical pocketbook 2007/2008

Therefore, if the EU is serious about meeting its emission targets for 2020, it will thoroughly have to reconsider its transport policies. This involves more than anything promoting a modal shift from road and air- the largest and fastest growing emitters of CO<sub>2</sub> - to rail as the most environmentally friendly mode of transport. Adequate charging schemes for all modes of transport, including their external costs will have to be devised so as to reflect the real cost of transport.

In the following, UNIFE will assess the current situation, propose a number of solutions to these mega-trends, provide an analysis of their benefits and provide concrete policy recommendations that aim at ensuring an effective and sustainable European transport system in the years and decades to come.

### 3. Analysis of the Status Quo

In order to better understand how these challenges can be met and what measures will be necessary, it is important to look at the current situation of the European transport sector and that of the European rail sector in particular. Taking the goals of the 2001 White Paper on Transport, where has a revitalisation of the rail sector been achieved and to what extent? This is important in order to see where we are starting from when proposing measures for the coming decades. UNIFE has identified four main areas where action has been and will be necessary in order to increase the modal share of rail transport:



#### 3.1. Level playing-field

The 2001 White Paper “European Transport Policy for 2010: Time to decide” pointed out that “*railways were unable to face up to competition from other modes. Consequently, market share in passenger and freight transport fell dramatically on account of the much larger increases in private car and air transport.*”. UNIFE regrets that the European Commission did not investigate further on the conditions faced by rail transport at the time.

Since then, rail freight's market share has been growing constantly. This is particularly the case in the Member States where liberalisation has been effectively implemented. Also, in the Central and Eastern European countries, the decrease in rail market share came to an end in 2005/2006.

However, in addition to intra-modal measures for rail transport, a level-playing between the different modes is highly needed. Today, inter-modal competition is still hindered by an unequal taxation and infrastructure charging.

*An unbalanced level of taxation and infrastructure charges between the different modes of transport*

	Railway transport	Road Transport	Air Transport	Maritime and Inland waterways transport
VAT on International Passenger Tickets	YES	YES	NO	YES
Energy and Fuel Tax	YES *	YES	NO ** (De jure total exemption)	NO (De jure total exemption)
Emissions trading scheme	YES indirectly***	NO	NO****	NO
Infrastructure charges	YES	Optional	Only for airports	Only for ports

Source: UNIFE 2009

\* Energy and Fuel Tax on electricity and diesel traction with reductions or exemptions in certain Member States

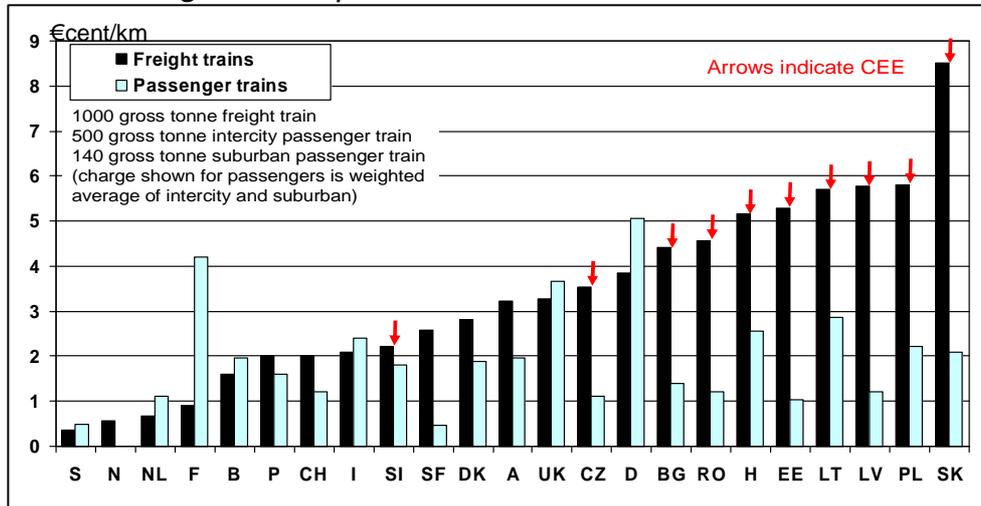
\*\* Optional reduced tax for domestic flights (Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity)

\*\*\* Railways are indirectly touched by the EU ETS, as they are big consumers of electricity, whose production is included in the EU ETS

\*\*\*\* From 2013, a step-by-step approach to include air transport in the revised EU-ETS is foreseen

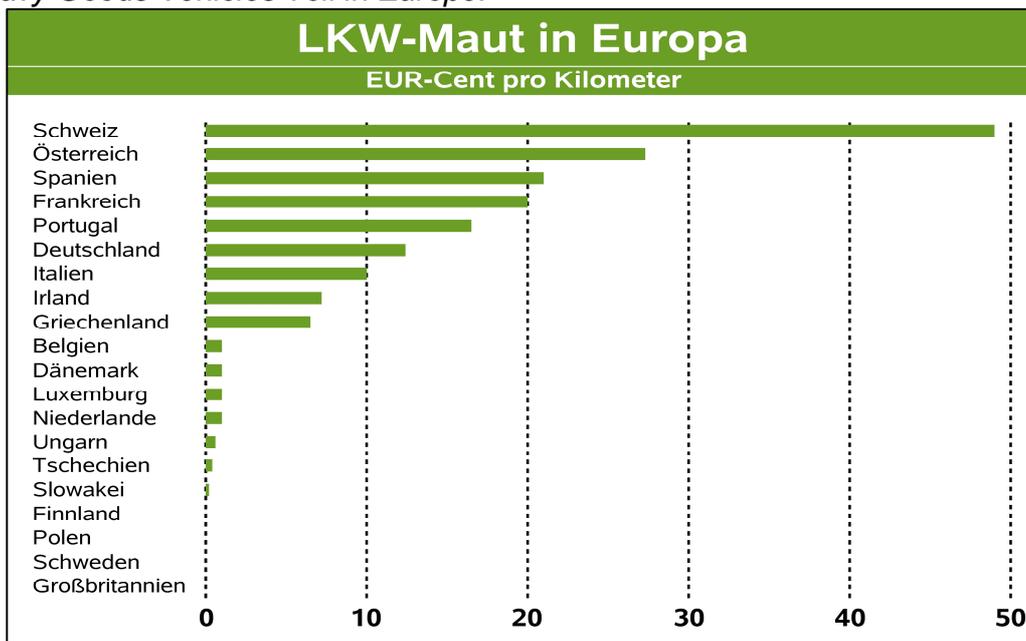


**Track access charges in Europe:**



Source: ECMT 2005

**Heavy Goods Vehicles Toll in Europe:**



Source: McKinsey 2005

Track access charges vary widely across the European Union. Member States charging high fees for the use of rail infrastructure are generally those which do not charge anything for the heavy duty vehicles' use of national motorways. For example, the highest rail infrastructure charges are collected in Central

and Eastern European countries while most of them do not impose any fee for road usage.

On the other hand, the Swiss road charges are five times as high as in Germany while track access charges for passenger trains are more than three times lower in Switzerland than in Germany. This has led inter alia to a considerable growth of rail freight traffic in Switzerland.

Therefore, UNIFE considers that the use of market-based instruments should be encouraged in the field of transport in order to establish a level-playing field between the different modes. A reform of the high tax burden that rail transport is suffering from is needed, especially when compared to road and air transport. As a first step, the removal of the strong taxation inequalities should focus on energy tax and VAT on international passenger tickets.

### 3.2. Investments in Infrastructure and Rolling Stock

Until today, the European Union has supported rail investments through two main instruments:

- In the framework of the Trans-European Transport Network, the EU grants financial aid to specific projects of Community interest;
- In the framework of the Regional policy, the EU co-finances infrastructure and rolling stock projects from structural and cohesion funds in order to narrow the gap between rich and poor regions.

#### *Trans-European transport network*

The Trans-European transport network is a major tool to foster economic competitiveness and a balanced and sustainable development of the European Union. According to a European Commission study<sup>4</sup>, the gains to expect from the completion of the 30 priority projects are substantial:

- A GDP level increase by 0,2- 0,3 % by 2020;
- The creation of 1 million permanent jobs, in addition to 3 million temporary jobs created during the construction period;
- Time savings on travelling (€ 8bn per year), congestion delays reduced by 14%;
- 4% reduction in greenhouse gases emissions.

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<sup>4</sup> European Commission, *The Economic Cost of non-Lisbon*, Occasional Papers, n°16, 2005, p.51

The implementation of the Trans-European Railway Network - including ERTMS and interoperability - is crucial for the further development of rail transport in Europe, and thus for the competitiveness of the continent. It can play a vital role in achieving the objectives set out in the Lisbon Strategy.

However, very few priority projects have been completed so far and the resources allocated to the TEN-T budget are far from being able to cover the financial needs: the total amount requested for TEN-T priority projects for the 2007-2013 period was € 11.5bn for a total of 30 priority projects. On the other hand, the available budget, including Galileo, is about € 5.3bn. Even if 74.2% of the funds have been awarded to rail projects by the Commission, most rail projects are still lagging behind schedule and will not be completed in the short term.

### *Regional policy*

Infrastructure funding in the framework of the Regional policy represents a fantastic opportunity for Member States to develop a sustainable transport network. Spain is role model in this regard. Through EU assistance, the country started building a high speed network which it is now developing further with its own resources. The focus of Regional Policy has now rather shifted to the new Member States. More than € 45bn from the structural and cohesion funds are to be spent on transport projects in the new Member States during the current budgetary period. However, only around one third of the resources will be spent on rail transport. Road projects still benefit from more than 50% of total EU funds allocated to transport projects.<sup>5</sup> Enhancing rail is often regarded as less pressing in comparison to road investments. This is even more so because funds absorption is much easier for road projects.

### **3.3. Rail Market Liberalisation**

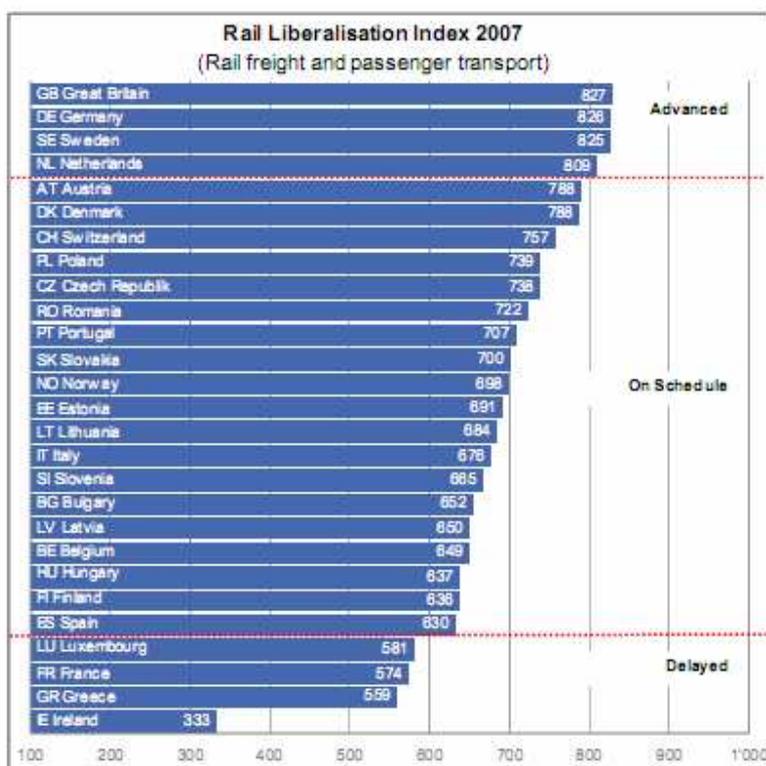
Since the adoption of the First Railway package in 2001, the EU has given an increased impetus to the rail market opening already embarked on during the 1990s. This market opening stated from the assumption that competition was a necessary element to revitalising Europe's railways.

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<sup>5</sup> Friends of the Earth, 'New report: EU funding plans in clash with climate New report: EU funding plans in clash with climate', Press Release, 11.4.2007, available at: [http://www.foeeurope.org/press/2007/April11\\_MK\\_EU\\_cash\\_climate\\_clash.htm](http://www.foeeurope.org/press/2007/April11_MK_EU_cash_climate_clash.htm)

The three subsequent railway packages that have been adopted since 2001 have gone a long way in opening rail transport markets and increasing intramodal competition in Europe. Rail freight has been entirely liberalised since 2007, while international passenger transport is to follow in 2010. Domestic passenger transport is still outstanding.

It has to be stated, however, that implementation of the legal texts in European Member States has been highly uneven, leading to a wide variety of different degrees of market opening, as the Liberalisation Index of Deutsche Bahn<sup>6</sup> demonstrates:



Source: DB 2007

A high correlation can be found between market opening and an increase in rail transport. Taking the example some of the most advanced countries, Great

<sup>6</sup> The DB Liberalisation Index consists of two elements, one assessing national rail regulation, the other practical market access possibilities.

Britain and the Netherlands where freight volumes have risen by more than 70%, whereas there has been a decline of 65% in Ireland and of 15% in France respectively. Thus the original assumption that market opening fosters market growth was right.

In this vein, while railway liberalisation remains a field where much needs to be done in terms of enforcing existing legislation (the ongoing infringement procedures against 24 Member States are an important means) and possibly improving existing texts, important progress has been made during the past decade.

### **3.4. Technical Harmonisation**

The European railway system is marked by a plethora of national standards and systems that are the legacy of the times when rail was regarded in almost exclusive national terms and the international dimension of rail transport was largely neglected. One prime example would be the Thalys travelling from Paris to Amsterdam or Cologne: in order to do so, seven different signalling systems are necessary!

Here again, important progress has been made during the past years with the adoption of the Interoperability Directive in 2004 and its Recast in 2008 or the setting up of the European Railway Agency (ERA). The subsequent and still ongoing adoption of the different Technical Specifications for Interoperability (TSIs) of the railway system are serving as an important tool to harmonise existing systems, to open markets and to build one European railway area.

However, these processes are far from being completed and further efforts are needed in the coming years.



## 4. UNIFE Policy Proposals

### 4.1. Level playing-field

#### 4.1.1. Introduce fair charging principles

Today, rail suffers from an unfavourable position vis-à-vis other transport modes such as road and air for various reasons. Railway operators pay infrastructure charges and a large number of taxes (such as the fuel tax, “eco tax” and value-added tax on tickets). These are not charged equally to other modes of transport.

On the other hand, rail transport is the mode that produces least external costs in comparison to road and air transport. At present, external costs, such as accidents, air pollution, noise, congestion and climate change are not taken into account when pricing transport. But, more than 80% of all external costs are caused by road transport while the average external costs of rail passenger traffic are one third of those of road traffic.

Railways are able to provide answers to these challenges. As pointed out in a recent study by the European Environment Agency, the environmental impacts of ever-increasing transport volumes can be significantly reduced by shifting to more environmental-friendly modes of transport<sup>7</sup>, such as rail. Also the United Nation’s Intergovernmental Panel on Climate Change<sup>8</sup> declared that shifting transport from road to rail is one of the key measures to fight the negative effects of transport on the environment.

In July 2008, the European Commission adopted the **Greening of Transport Package**, which includes a proposal to revise the Eurovignette Directive on charges for heavy-goods vehicles. This marks an important milestone in the drive to internalise the external costs of road transport, which will put the “polluter pays” principle into practice. However, the exclusion of CO2 emissions is contradictory to EU objectives such as the effort-sharing decision of the Climate Change Package of January 2008, which sets binding targets for reducing CO2 emissions in sectors such as transport. UNIFE has been following

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<sup>7</sup> EEA Report 1/2007, « *Transport and environment : on the way to a new common transport policy* », European Environment Agency, p.4.

<sup>8</sup> Working Group III contribution to the Intergovernmental Panel on Climate Change, Fourth Assessment Report, Climate Change 2007: Mitigation of Climate Change, Summary for Policymakers, p. 14 (available at: <http://www.ipcc.ch/SPM040507.pdf>)

the debate at the European Parliament and Council closely during the past months and regrets that no agreement could be reached so far.

Therefore, in order to allow for fair competition between different modes of transport, UNIFE supports an ambitious framework for the internalisation of external road costs according to the “polluter-pays-principle” that would remove the current inequalities between the different modes of transport. It is important to draw on the experience that prices play an important role in guiding transport decisions. The London congestion charge and the Swiss heavy goods vehicle toll are a prime example for this: No price tag - no change in behaviour.

#### 4.1.2. Co-modality and flexible transport solutions

In order to respond to the corresponding challenges of globalisation, climate and demographical change, more flexible transport solutions need to be found. These solutions need to efficiently combine different modes of transport so as to reduce CO2 emissions and facilitate the use of more environmentally friendly modes of transport such as rail to the largest extent possible.

##### *Passenger Transport*

For passenger transport, this would involve the creation of transport hubs and of integrated multimodal travelling systems. Connections between different modes of transport should be organised as efficiently as possible so as to reduce waiting times and provide transparency to the different offers that exist. The rail connection at transport hubs should be improved. A similar logic applies to seamless connections in urban and suburban transport. Rail should be the preferred solution for travel to and from airports. This may involve: Investments such as the Diabolo project at Brussels airport.

It may also involve information solutions across modes that allow for fluid modal changes such as integrated ticketing for air-rail travelling and smart-cards for facilitated access. This would allow for the use of rail transport along short to medium distances, while intercontinental travel would necessarily continue to be done by air. By offering such services, the overall environmental balance of long-distance journeys would thus be considerably improved. Furthermore, access to such schemes would offer passengers the ability to



compare prices and travelling times in order to adapt to their needs in the most flexible way.

A seamless rapport between different modes is necessary. Rail would thus have the benefit of connecting short distance modes such as bike or public transport to longer distance modes such as air.

### Freight Transport

For freight, intermodality should involve a modal shift from road to rail over longer distances, while distribution in e.g. cities could still be done by road. Intermodality requires effective interfaces between different modes of transport.

For rail transport, this means that sufficient terminal capacity is needed. With growing transport volumes, terminal capacity along the major freight corridors that has very high capacity utilisation rates at present, will most likely become congested in the coming years. For the corridor Rotterdam-Genoa, this means that terminals should be at 129 % of their capacity in 2020.<sup>9</sup> Thus terminal capacity needs to be enhanced, while open access to all operators should be granted. Only by doing so can rail freight unfold its full potential. Especially for large harbours, rail transport should provide the preferred link to the hinterland, terminal capacity for rail thus needs to be improved.

Countries (number of terminals)	2007 Capacity utilisation rate (%)	2015 Capacity utilisation rate (%)	2020 Capacity utilisation rate (%)
NL (4)	64	84	111
Rhine-Ruhr (11)	77	112	150
Rhine-Main (2)	37	70	105
Rhine-Neckar (7)	85	106	143
Upper-Rhine (1)	81	96	122
D (21)	76	106	142
CH (3)	97	105	105
I (4)	62	85	123
total corridor (32)	71	97	129

Source: NEA, 2009

<sup>9</sup> Source: NEA

Furthermore, when talking about rail freight, intermodality and flexible transport solutions, the problematic of the last mile should be borne in mind. While in city centres it may be necessary to distribute goods by lorries on the last mile, this should not be the case for all transport. The Swiss example of co-financing feeder lines to factories helps to foster a modal shift to rail where possible. Rail links to production sites should in the future be given the same importance as road links. The more sidings are at use, the more efficient rail transport can become, even at the last mile; and the more rail can be used for freight right from the source.

Finally, taking account of the international nature of most rail freight operations, interoperability needs to be enhanced. Especially when crossing borders, rail freight encounters many obstacles, particularly when compared to the road. Comparable levels of flexibility in rail freight should be aimed at.

**For passenger transport, UNIFE therefore recommends a better intergration of different modes of transport, especially in terms of linking modes and of providing integrated and easily accessible transport solutions to passengers.**

**For freight transport, UNIFE would like to see concrete funding schemes for last miles in rail transport, so as to enhance the flexibility of rail transport and to allow for direct rail access to factories. In addition, terminal capacity along the major rail freight corridors is likely to become congested in the coming years. Here again, sufficient emphasis needs to be laid on enhancing them.**

## **4.2. Investments in Infrastructure and Rolling Stock**

### **4.2.1. Financing and Investments**

In the coming decades, transport infrastructure will have to face a twofold challenge. On the one hand an ageing infrastructure will have to be modernised and upgraded in order to meet the demands of growing transport flows. On the other, new infrastructure will have to be constructed in order to meet capacity demand in certain regions as well as to better link up European Member States.

However, these needs do not correspond to the investment policies carried out both at national and European level so far. The 2006 Mid-Term Review of the White Paper on Transport noted that the level of investment in transport

infrastructure has fallen in all EU Member States (except Spain) to less than 1% of GDP.

Rail will only be able to compete with other modes of transport and unfold its environmental benefits if a modern infrastructure is provided. Modal shift occurs where a reliable and rapid connection is available, such as high-speed lines for passenger transport (see next section). Therefore, infrastructures as well as rolling stock need to be up-to-date and of excellent quality. A significant share of public investment (from the Member States and the EU) in transport should go to the rail sector.

In order to meet these challenges and for the reasons mentioned earlier (see section 3.2.), there is a strong need for a new political impetus at both the national and at the European level providing financial means for the realisation of concrete projects.

#### *Trans-European Transport Network*

Since only very few TEN-T priority projects have been completed so far, a new approach should be found in order to finalise a larger number of projects in the near future. The TEN-T Policy should give a clear and binding timetable for projects' completion, at least for the priority projects. The TEN-T budget should continue to be used primarily for railway projects, with a special emphasis on the need to urgently deploy ERTMS on European corridors. This fosters interoperability and the competitiveness of the continent. Besides, as the TEN-T budget has proven to be far too insufficient, it should be dramatically increased during the next financial perspectives.

#### *Regional Policy*

Although it is quite understandable that new Member States also need to develop their road infrastructure, they should not neglect rail transport. It is the most sustainable transport solution for the future. For this purpose, EU Regional Policy and Transport Policy should be better linked. In particular, the four following objectives of the EU Transport Policy need to be better taken into account when implementing Regional Policy: the completion of TEN-T priority projects; the implementation of rail freight corridors; the implementation of ERTMS<sup>10</sup>; and modal shift to the most environmentally-

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<sup>10</sup> ERTMS is the European Rail Traffic Management System.

friendly modes of transport. As a consequence, the European Commission shall also support a more balanced allocation and use of the EU's Cohesion and Structural Funds for rail and road projects. Besides, as most new EU Member States have difficulties to absorb the large amounts of money available to finance their infrastructure investments, the European Commission needs to make more efforts and should put pressure on member States so that funds are effectively spent during the programming period.

The added value of funding from the TEN-T budget and Regional Policy has been demonstrated and is already widely acknowledged. However, funding cannot propel a modal shift. Therefore, UNIFE calls upon the European Union to strengthen its policies for a quicker project implementation and to grant more financial support to rail transport than today. As far as the TEN-T policy is concerned, the European Commission should push for an increase of the TEN-T budget in the next financial perspectives and at least maintain the share of rail projects among the funded projects. As far as the Regional policy is concerned, the European Commission should maintain the current Regional Policy budget dedicated to transport projects and reinforce the share of rail projects within this budget.

#### 4.2.2. Very High Speed (VHS)

The history of transport has been marked by a constant pattern: the acceleration of mobility. In the field of rail transport, very high speed rail (above 250kph) has dramatically changed inter-modal competition, allowing rail to compete directly with air transport on medium distances. It is thus responding adequately to mobility demand without jeopardising the environment. However, until now, very high speed rail in the EU remains a purely Western European phenomenon, as these lines only exist in France, Spain, Italy, Germany, Belgium, the United Kingdom and the Netherlands. Even so it is acquiring a truly European dimension, as these networks are increasingly becoming linked to one another and are thus offering very quick connections between the main cities of these countries. Considering the occupation rate of most trains, it has become clear that these trains respond to the population's needs in terms of transport.

Thus, the dramatic success of VHS rail makes this type of infrastructure increasingly attractive to other countries. In Sweden, investigation for a future VHS line between Stockholm, Gothenburg and Malmö has already reached an

advanced stage. Poland has included a VHS line in its rail infrastructure master plan. The Czech Republic is thinking about it. In the long term, Hungary and Romania would also like to be connected to the VHS rail network. However, there is no real European coordinated approach regarding VHS rail besides the dedicated high speed TEN-T priority projects so far.

Obviously, there is a window of opportunity for the European Union to take action in order to develop a truly European very high speed rail network. Such an initiative is particularly relevant, since favourable conditions are currently met: increasing demand from the public for VHS connections and growing political support in the Member States. Besides, VHS rail investments are a sustainable solution in terms of environmental, socio-economic and safety benefits.

#### *The socio-economic rationale*

VHS rail does not only improve passenger transport. It also has a dramatic effect on the economy. According to a study conducted by the Spanish government, the construction of the VHS network has had a threefold effect:

- The investment creates a positive economic shock (0.9% of the Spanish GDP in 2005);
- As a consequence, there is an important demand effect during the project construction (around 1.6% of the GDP in 2005), due to productivity increase.

Therefore, the total effect of rail investments on the Spanish GDP was about 2.5% in 2005 (sum of investment shock and demand effect).

Costs savings for the society resulting from modal shift should also be taken into account: there are considerable gains in time, energy and other externalities. According to a study from ADIF, the Spanish rail infrastructure manager, the new Madrid-Barcelona VHS line generates the following yearly savings<sup>11</sup>:

- €170m savings in time
- €49m savings in energy
- €106m in other externalities.

The total savings per year amount to about €325m/yr.

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<sup>11</sup> Compared to the anterior situation (without high speed line)

Locally, VHS rail also has a lasting impact on the competitiveness of the territories that are connected with it. Andalusia, once one of the poorest Spanish regions, has encountered a dramatic growth since the opening of the Madrid-Seville line in 1992. Thus, VHS rail makes sense from the perspective of the EU cohesion policy. Although it is mostly a Western European system so far, if it is implemented as well in Central and Eastern Europe, VHS rail can contribute to closing the gap between the current cohesion regions and the richer European regions.

Finally, connecting Western and Eastern Europe with a very high speed rail network would globally improve the competitiveness of the continent.

### *The environmental rationale*

The European Union has committed itself to reduce its CO<sub>2</sub> emissions by 20% by 2020. So far, outlooks for transport emissions contradict this objective. They continue to grow. VHS rail is a relevant solution to drastically decrease passenger transport's emissions.

Firstly, VHS rail produces least CO<sub>2</sub> emissions.<sup>12</sup> French statistics for example show that on a 500-km trip, high speed trains generate 7 gr of CO<sub>2</sub> per passenger per kilometre, busses produce 17 gr of CO<sub>2</sub> pkm, individual cars produce 47 gr CO<sub>2</sub> pkm, planes produce 66 gr CO<sub>2</sub> pkm.<sup>13</sup>

It is empirically demonstrated that wherever a new very VHS rail project has been implemented it has created a dramatic modal shift. For instance, on the Madrid-Sevilla line, rail modal share grew from 19 to 53% after the opening of the VHS line. Similarly, on the Paris-Brussels line, rail transport market share grew from 24 to 52%. This engenders a dramatic decrease in energy consumption, air pollution and CO<sub>2</sub> emissions.<sup>14</sup>

Secondly, land requirement to build a VHS line is much smaller than for motorways as the width for a double line train path is 15m vs. 28m for a motorway.

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<sup>12</sup> This is simply because electric traction is the only way of massively moving goods and people without burning fossil fuel and also because it allows for full regeneration of energy in braking.

<sup>13</sup> According to ADEME "éco-comparateur", for a 500-km trip; refers to the rate of CO<sub>2</sub> emissions per kW/h of electricity produced in France

<sup>14</sup> Source: ADIF



Thirdly, when a new VHS line is built, it frees capacity the conventional lines. This capacity can be used for freight, thus decreasing bottlenecks. If a modal shift occurs in the freight segment, due to increased capacity and the improvement of the services quality, this has, in turn, a supplementary beneficial effect for the environment.

### *The safety rationale*

Very high speed rail is the safest mode of transport. So far there have not been any fatalities in a TGV accident in France.<sup>15</sup> In 2001, the average number of people killed per bn pkm was 0.2 for conventional rail, 0.4 for air transport, 0.4 for busses and coaches and 5.9 for passenger cars.<sup>16</sup>

Therefore, UNIFE considers that the development of a European very high speed rail network, possibly in the context of the review of the TEN-T policy, should be one of the key priorities for the transport policy of the future. This would contribute to improving transport safety, decrease the impact of transport on the environment, and increase the competitiveness of Europe.

### 4.2.3. Urban Mobility

Cities are the areas where challenges affecting mobility are most striking. The concentration of population and economic activity, coupled with land scarcity and pollution growth, calls for new solutions responding to the population's needs. In its green paper on urban mobility, the European Commission states that transport in European cities needs to address three main challenges today:

- **Protecting human beings** from the risks inherent from mobility, i.e. avoiding accidents during transport and violence on the vehicles and in the stations;
- **Responding to the population's increased mobility demands** and their consequences. That is, for instance, reducing congestion, providing a reliable and rapid public transport, optimising the capacity of existing transport infrastructures by improving intermodality and gaining efficiency in each domain by suitable use of ITS technologies

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<sup>15</sup> Please note that no statistics for this segment could be identified at the EU level.

<sup>16</sup> Source : European Environment Agency, *TERM 2005 09 — Number of transport accidents, fatalities and injuries (land, air and maritime)*

- **Protecting the environment**, i.e. reducing CO<sub>2</sub> emissions, air pollution and noise in urban areas.

Further urbanisation of European societies is likely to aggravate these challenges even further. Of course, there is no simple and unique solution to address these challenges. However, the European rail supply industries can significantly contribute to improving urban mobility. Our products respond to all three challenges above. Our industry is committed to provide safe, reliable, rapid and environmentally-friendly products. This commitment has driven us during past decades and we will keep it up in order to maintain our position at the forefront of sustainable urban mobility.<sup>17</sup> Among the different modes of transport, urban rail creates least problems of congestion and corresponding external costs such as accidents, air pollution, noise, impact on nature and landscape, up- and downstream processes, urban effects, congestion and climate change.

#### *Safe products*

**Rail-bound transport (metro, light rail and commuter trains) is by far the safest mode of transport in urban areas.** Rail passenger fatalities have amounted to around 100 per year since 1999 in Europe, both in urban and mainline. This is far less than all other modes of transport, even only in urban areas.

#### *Reliable, rapid and comfortable products*

One of the main limitations to urban mobility is road infrastructure congestion. This phenomenon is costly (time losses, health impact from pollution and stress). Public transport enables local authorities to counterbalance congestion. Among the different transport modes, **rail-bound urban transport is the best answer to congestion, due to its large capacity.**

#### *Environmentally-friendly products*

Finally, the European Railway Industries provide **the least polluting existing urban transport systems.** CO<sub>2</sub> and pollutant gas emissions from trams, light-rail and commuter trains are close to zero. These transport solutions can largely contribute to make cities' air cleaner.

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<sup>17</sup> This fact has also been recognised in several independent studies: Cf. IWW/INFRAS, *External Costs of Transport, Update Study, Final Report*, October 2004

	BUS	Tramway	Metro	Commuter railways
Max. vehicle capacity	120-150	350	1800	3000
Max. line capacity (pphd)	2400-2300	11000	81000	110000
Distance between stations (m)	300	300-500	400-1500	1000-2000
Commercial speed (km/h)	10-25	20-30	30-35	40-50
Min. headway (sec)	180	120	90	100
Costs per km	€ 0,5-1 m	€ 25 m	€ 150 m	€ 30-150 m
Service quality	**	***	****	****
Space occupation	*	***	****	****
Air pollution	*	****	****	****
Noise	*	***	***	***
Energy consumption	*	***	****	****

Source: UITP, UNIFE

In order to make urban mobility in European cities safer, cleaner and faster, UNIFE considers that it is necessary to promote a modal shift to public transport, and in particular to the least polluting, safest and most reliable and rapid means of transport: those are light rail, metros and commuter trains.

Two main approaches should be considered and combined to achieve modal shift: discourage the use of cars on the one hand, and encourage the use of public transport, and in particular urban rail-bound transport on the other. This must be supported with an integrated transport policy, combining:

- Supply-side measures, such as the **improvement of the quality of public transport and the development of an adequate parking policy in conjunction with public transport**
- Demand-side measures, such as a reasonable **adaptation of public transport pricing policy and the development of urban charging schemes**
- Behavioural initiatives, such as the **promotion of walking and cycling in conjunction with the use of public transport, the implementation of zones with reduced speed for vehicles and education initiatives.**

The European Union can support this process of modal shift in cities by taking the following key measures:

- **Financing of clean and energy-efficient urban transport:** a portion of the EU budget could be reallocated to urban transport when revising the EU financial perspectives; resources from the EU emissions trading scheme could be used to finance urban transport. The proportion of (infrastructure and rolling stock) urban rail transport investments among structural and cohesion funds could be increased. A European legal framework for urban charging should be created and allow for revenues to be used to finance infrastructure.
- **Standardisation:** a dedicated urban rail European voluntary standardisation framework should be developed with the support of the European Commission issuing a mandate to CEN, CENELEC and ETSI for the development of harmonised standards for use in the field of urban rail.
- **Best practices:** the European Union should create a **platform of cities and mobility stakeholders**, including the rail supply industry, in order to exchange best practices regarding urban mobility.
- **Procurement:** the European Union should develop a **legal framework for green infrastructure procurement**, where the environmental performance of the infrastructure and its operation should be assessed, before granting public funding

### 4.3. Rail Market Liberalisation

For rail, in terms of meeting a growing demand for transport and for meeting its customers' demands for flexible and efficient transport solutions, further changes in the way the sector is governed will become necessary. The European Union has, with its three successive railway packages, already taken important steps in this direction. As experience has shown, it is especially in those countries where the market has been most liberalised, that rail transport has increased the most. In the UK, rail passenger travel has increased by 46% in comparison to 1996/1997 the year of liberalisation.<sup>18</sup> The same is true for rail freight: between 1995 and 2006, in the UK, rail freight has increased by 74 %, in the Netherlands by 72% and in Germany by 52%. In all these countries, this growth of rail transport has gone hand in hand with a corresponding increase of

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<sup>18</sup> MackBrooks Report 2008

rail's market share: A sign that rail market opening benefits rail in intermodal competition and helps to meet transport customers demands.

**Thus, in the coming years a progressive further market opening including domestic passenger transport, and a close assessment whether existing legislation is adequately implemented will become necessary.** By doing so, rail will be made fit to meet the challenges of the future and is better positioned to fulfil its role as the most environmentally-friendly mode of transport. The past ten years clearly prove that increased intramodal competition leads to more intermodal competitiveness of the rail sector.

#### 4.4. Technical Harmonisation

##### 4.4.1. Interoperability

Globalisation and regional specialisation, a corresponding growth of demand for international transport solutions coupled with the need to find sustainable solutions to meet this demand all point towards a need for more international rail transport. At present, international rail traffic meets a large number of obstacles when crossing national borders.

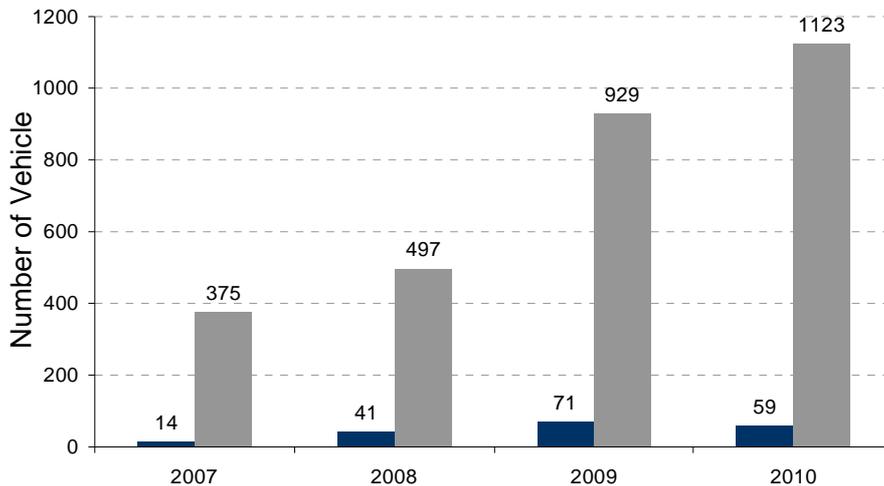
For the European rail industry, this translates predominantly in problems of interoperability of national railway systems. Enhancing the interoperability of these systems in terms of rolling stock, railway infrastructure, control-command and operations will serve a long way to overcoming many of the technical obstacles and thus to facilitate and to enhance international rail traffic and open railway markets.

The European rail industry has virtually achieved interoperability and is in the position to offer products that are able to run along all European rail networks. However, we encounter a large number of problems when it comes to the authorisation of rolling stock. While it has been the proclaimed aim of European rail transport policy of recent years to promote and create a truly European railway area, a large number of national administrative and bureaucratic obstacles persist.

The table below, which shows the number of locomotives and passenger vehicles (in Grey) as well as the number of types to be certified (in black) to be put in service each year in Germany, gives an indication of the size of the



problem, when the cost of a type certification varies from 1 to 5 millions Euros for each country where vehicles have to be authorised.



Source: VDB.

UNIFE recognises that the new Directive on interoperability of the European railway system (2008/57/EC) already takes important steps in the right direction. The foreseen extension of the geographical scope of Technical Specifications of Interoperability (TSIs) beyond the TEN-T network to all lines (with the only exemption of Urban systems), as well as the introduction of the concept of cross-acceptance as an intermediate solution, are essential steps towards a final harmonisation of the rules of acceptance. However, the Railway Safety Directive (2008/110/EC) continues to stipulate that National Safety Authorities (NSAs) remain the only ultimate safety authorities. This leaves much room for differing national interpretations and requirements that often hamper the progress of interoperability of the European railway system.

**UNIFE therefore recommends extending the competences of the European Railway Agency (ERA), so as to take the full benefit of the development of an harmonised European system. In the coming years, all possible political and above all legislative efforts should be made in order to strengthen the role of the ERA as a central authority and to convert it into the only European certification authority, somewhere along the lines of the European Aviation Safety Authority (EASA).**

### The case of ERTMS

In a global context where traffic flows are constantly on the rise, the ability of rail transport to absorb a growing international transport demand will play a key role in positioning the sector as a competitive alternative to road transport. At the same time, the existence of more than 20 signalling systems in Europe are a major obstacle to the development of a competitive international rail transport system. As compared to trucks that run freely across Europe without major hindrances the rail sector strongly suffers from these different signalling systems, which are inherited from the past.

Indeed, each train used by a national rail company has to be equipped with at least one system, but sometimes more, just to be able to run safely within that one country. This is costly and significantly increases the technical and operational complexity of train sets.

The European Rail Traffic Management System (ERTMS) is a key technical solution to achieve interoperability on the European railway network, but also to respond to a growing transport demand. Not only does ERTMS enable full interoperability along the European railway network, but it also helps to improve capacity on railway lines as a high-performance signalling system. It is gradually becoming a global standard, with more than 30,000km of railway tracks contracted, including in countries such as China , Taiwan , South Korea , India and Saudi Arabia.

Whilst ERTMS is already in operation on a number of railway lines at a national level, the first main cross-border connections will only be completed by the end of the decade. This stresses the need for a coherent approach, where under the EU umbrella ERTMS investments should be considered as a priority by the EU countries.

Indeed, the full benefits of ERTMS in terms of interoperability and performance can only be realised if, along a given international corridor, national investments are coordinated. By equipping its network with ERTMS, a country technically “opens” its network to ERTMS trains and therefore expects its neighbouring countries to do the same.

For the above-mentioned reasons, UNIFE urges the European Union to take the necessary measures so that a large “ERTMS network” can be completed as soon as possible. The dedicated funding should be increased, whilst national investments should benefit from an improved coordination. In this regard, a binding European Deployment plan should be regularly updated to include additional strategic lines.

#### 4.4.2 New Products and Solutions: The role of railway innovation

Another important means to meet the challenges that the transport sector will face is to develop new technological solutions. In order to maintain our global leadership and in size, these include the development of more environmentally

friendly vehicles and infrastructure, as well as new solutions to enhance the capacity of the transport system.

The European rail industry is currently actively involved in developing such solutions. UNIFE member companies spend some 1 bn € per year in competitive research. Through its participation in the European Rail Research Council (ERRAC) and through the coordination of EU funded projects on non-competitive research, further important actions are taken in order to promote the development of rail and to make it meet the challenges of the future.

ERRAC developed a ‘Strategic Rail Research Agenda’ to inform about the planning of research programmes across the EU. This was achieved in 2007 with the publication of the updated Strategic Rail Research Agenda 2020 (SRRRA).

Today activities of ERRAC focus on the elaboration of annual concrete and detailed roadmaps for future common European Research activities. These enable a step by step approach to reach the goals of the Strategic Rail Research Agenda 2020.

**In order to keep up these efforts and to strengthen them even further, UNIFE proposes to take into account the annual ERRAC roadmaps in EU policies. They will represent the updated and concrete measures to be taken in order to meet the technical challenges of the Future of European rail transport.**

**In terms of policy coherence, UNIFE proposes a close cooperation in terms of policy priorities and a better coordination of research activities between different DGs of the European Commission. At present, research priorities do not always reflect the political goals pronounced elsewhere.**

**These priorities should also be reflected in the funds allocated to railway research. The expectations that are put in rail do not correspond to the sums foreseen to finance railway research. This discrepancy is becoming even more visible during the current economic crisis, where additional financing is granted to the automotive sector.**

## 5. Conclusions

In order to meet the challenges that the transport sector is about to face in the coming years much needs to be done. If the European Union would like to achieve a sustainable transport system in the long run, the necessary policy measures will have to be taken in the near future in order to lay the ground works for such a system.

Rail transport, as the mode with the lowest emission record of all modes of transport, is uniquely placed to offer some of the transport solutions necessary to meet the future challenges of globalisation, urbanisation and climate change.

In this paper, UNIFE has provided some policy recommendations that we deem pertinent to achieving these transport policy goals.





## About UNIFE

UNIFE, the Association of the European Rail Industry, represents 60 of Europe's leading large and medium-sized rail supply companies active in the design, manufacture, maintenance and refurbishment of rail transport systems, subsystems and related equipment. A further one thousand suppliers of railway equipment partake in UNIFE activities through 15 national rail industry associations. UNIFE members have an 80% market share in Europe and supply more than 50% of the worldwide production of rail equipment and services.

UNIFE represents its members' interests at the level of both European and international institutions. On the technical side, the association works on the setting of interoperability standards and coordinates EU-funded research projects that aim at the technical harmonisation of railway systems.

UNIFE's mission is to pro-actively develop an environment in which UNIFE members can provide competitive railway systems for increased rail traffic.

[www.unife.org](http://www.unife.org)