1. INTRODUCTION

Transport is a fundamental sector for and of the economy, for it embraces a complex network of private and public companies which provide goods and services to citizens and businesses in the European Union and its trading partners. It also provides mobility for Europeans, thus contributing significantly to the free movement of persons within the Union's internal market.

Efficient transport services and infrastructure are vital to exploiting the economic strengths of all regions of the European Union and to supporting the internal market and growth. Thus, they enable economic and social cohesion. They also matter for trade competitiveness, as the availability, price, and quality of transport services have strong implications on production processes and the choice of trading partners. With such a central role, transport is by definition also inter-related with various other policy areas, such as environmental and social policies.

The main challenges for the transport sector in the European Union include creating a well-functioning Single European Transport Area, connecting Europe with modern, multi-modal and safe transport infrastructure networks, and shifting towards low-emission mobility, which also involves reducing other negative externalities of transport. From a social perspective, affordability, reliability and accessibility of transport are key. Yet, this has not been achieved across the board. Addressing these challenges will help in pursuing a sustainable growth in the European Union.

Recently, the Commission has taken several initiatives to foster the development of the single European transport area, a policy that it has been pursuing for decades now. Progress towards this goal has been made, e.g. with:

- the 4th Railway Package;
- the Blue Belt initiatives for maritime transport;
- the proposed Single European Sky II+ package for aviation transport (still pending);
- the NAIADES Programme to promote inland waterways.

The Commission seeks to address shortcomings, particularly in the market integration of road transport, through a set of initiatives for a socially fair transition towards clean, competitive and connected mobility presented in its Low-emissions Mobility Strategy (adopted in July 2016) and subsequently in its Communication "Europe on the Move"¹ of 31 May 2017. This Communication accompanies a series of legislative proposals (so-called 'mobility package') the revision of the rules on access to the road haulage market, improved social legislation for road transport and a revision of the road charging rules.

On 8 November 2017, the Commission adopted a second set of proposals ('second wave of the mobility package'). They respond to the challenge of making mobility clean, competitive and connected through a combination of demand- and supply-side measures on low-emission

¹ COM(2017) 283.
mobility. These combine an enabling regulatory framework with action to mobilise financial means, where needed, while ensuring consumer acceptance and safeguarding the social protection and employment dimensions.

In concrete terms, the proposals encompass a number of measures with the aim to enable a transition towards low and zero emission mobility, such as a reform of the Clean Vehicles Directive or a follow-up to the Action Plan related to the Alternative Fuels Directive2.

The shift towards low-emission mobility was already an objective in the Transport White Paper of 2011 and supported by various initiatives. The 2016 Communication 'A European Strategy for Low-Emission Mobility' highlights the areas on which Commission initiatives will focus:

- digital mobility solutions;
- a fair and efficient pricing in transport (which should better reflect negative externalities of transport);
- promotion of multi-modality;
- an effective framework for low emission alternative energy;
- roll-out infrastructure for alternative fuels;
- interoperability and standardisation for electro-mobility;
- improvements in vehicle testing;
- a post-2020 strategy for all means of road transport, supported by research efforts and investment3.

Additionally, in 2018 a 'Multi-modal Year' will bring together relevant initiatives and events, including a 'European Single window' in maritime transport. As part of the second wave of the mobility package, the Commission is proposing a revision of the Combined Transport Directive4.

More details on the state of play of transport policies can be found in the 2016 White Paper implementation report5, in the staff working document accompanying the Communication 'Europe on the Move'6 and in the Implementation report of the EU maritime transport strategy 2009-20187.

To help EU countries develop the trans-European transport network (TEN-T network), the European Union adopted a Regulation in 2013 providing Union guidelines for transport investment (TEN-T guidelines). The Regulation establishes a legally binding obligation for the EU countries to develop the so-called 'core' and 'comprehensive' TEN-T networks.

In addition, the Regulation identifies projects of common interest and specifies the requirements to be complied with in the implementation of such projects. The Connecting Europe Facility (CEF) Regulation8, adopted in 2013, allocated a seven-year budget (2014-2020) of EUR 30.4 billion, of which EUR 24 billion are for the transport sector.

These examples demonstrate the considerable opportunities provided by the European transport sector, but also the challenges it faces, notably in terms of digitalisation, innovation, global leadership and societal benefits. This is particularly true in the current situation of disruptive changes in technology (e.g. e-mobility) and mobility patterns (e.g. the sharing economy) which highlights both the challenges but also the opportunities discussed in this note.

This note is structured as follows. Section 2 reviews the performance of EU countries in transport market functioning, in infrastructure quality and in the environmental impact of transport. Section 3 identifies the policies to address the challenges and reviews the approach taken at Union level. Section 4 examines the state of play of existing policies and takes stock of where EU countries stand in implementing these policies.

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5 SWD(2016) 226.
6 SWD(2017) 177.
7 SWD(2016) 326.
2. POLICY CHALLENGES: OVERVIEW OF PERFORMANCE IN EU COUNTRIES

In the European Union, the transport and storage sector employs around 11 million persons, accounting for more than 5% of total employment\(^9\) and almost 5% of GDP\(^{10}\).

However, the share of women employed in the transport sector is low. According to the Eurostat Labour Force Survey, in most EU countries, women represent around 20% of the labour force in the transport sector (2016). Some of the reasons, given by social partners, why women are underrepresented in the transport sector include:

- a lack of appropriate work-life balance in shift work;
- workplace and equipment not being adapted (e.g. lack of sanitary facilities for women, safety clothing not available in women sizes);
- insufficient targeted recruiting of women in a sector that has the reputation of being dominated by men;
- a lack of training and life-long learning opportunities.

The European transport sector provides ample growth opportunities, but significant challenges remain to fully exploit these opportunities. Given that transport and logistics represent a **sizeable share of company costs and of households' expenditure**, the provision of more efficient transport services and better logistics can affect citizens and businesses in a tangible way. For households in the EU it is estimated that transport accounts roughly for 13% of their total final consumption. Improved infrastructure and optimised performance of multimodal logistic chains can help to reduce logistics costs.

For high-value added products and services produced in Europe, transport costs may not be a very significant proportion of total costs, but the reliability of logistic is critical to the functioning of increasingly complex value chains. In order to seize transport-related growth opportunities and reduce costs related to transportation, a number of horizontal challenges need to be addressed. These can be grouped under three headings: market functioning, infrastructure and negative externalities.

2.1. Sub-optimal market functioning

The transport policies in the EU are characterised by divergent national priorities. Fragmentation of the transport market will continue to limit the quality of transport services in Europe and will leave growth potential untapped, unless European policy initiatives towards a Single Market for transport, such as the ones quoted above, are thoroughly implemented at national level.

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\(^9\) Eurostat Labour Force Survey, 2016 data, for NACE H: 'Transportation and Storage'.

\(^{10}\) Eurostat National Accounts, 2015 data, for NACE H: 'Transportation and Storage'.

\(^{11}\) The countries covered by data in this factsheet are the EU28, unless otherwise specified.
In addition, **gaps in the social legislation** related to transport and divergent national practices have led to deteriorating social conditions for transport workers and may also worsen the quality of transport services. Market opening and social cohesion are thus intrinsically linked.

**Rail transport** in particular has been struggling to achieve its potential, despite its comparative advantages (notably speed and comfort for passengers and economies of scale for freight) over medium to long distances and despite the significant contribution it can make to both the decarbonisation of transport and socially inclusive mobility.

**Rail freight services** suffer from low quality and reliability, due to the lack of coordination in cross-border capacity offer, traffic management and planning of infrastructure works.

The creation of a **Single European Rail Area** requires major efforts to achieve technical interoperability and to ensure that rolling stock is able to run across national borders. In addition, standardisation of systems and equipment in its broader sense is crucial to gain efficiency and reduce costs. Specific EU legislation, such as the Technical Pillar of the 4th Railway Package, aims at promoting interoperability. The rules are implemented with the assistance of the European Union Agency for Railways (ERA).

The **lack of effective competition** may explain why in many EU countries rail transport has not developed the customer-oriented services, innovative business models and costs/price reductions that can be witnessed after market opening in other transport modes. The degree of competition in the railway sector, measured as the total market share of all but the biggest railway companies, is not high (see Figure 2). Although a low number of competitors may reflect the small size of a market, various barriers to entry still hamper the development of competition in rail.

The **rail freight market** has been fully open to competition since 2007. Between 2010 and 2015, the market shares of competitors continued to increase in most EU countries, most significantly in Belgium, Bulgaria, the Czech Republic, Germany and Hungary. Exceptions to this growth trend were Estonia and France.

In the **rail passenger market**, the market shares of competitors are lower and less diverse, and also depend on the degree of liberalisation, which varies across countries. In most countries incumbent rail companies have control over 80% of the market, except for Poland (48%), Sweden (67%), Italy (77%) and the United Kingdom (where there is no incumbent). In 10 countries there were still no alternative operators in 2015.

The 4th Railway Package is set to **complete the market opening process** by dismantling the remaining legal monopolies in domestic passenger markets. It introduces the principle of competitive tendering for public service contracts (PSCs) and improves the way infrastructure is governed to create a non-discriminatory environment. However, until the package is fully implemented, important challenges remain to be addressed on the ground.

Rail passenger market opening has been pursued by several EU countries in advance of the legal deadlines imposed by EU law, to different degrees and with varying results. New commercial (open access) services have been introduced in the Czech Republic, Germany, Italy, Austria, Sweden and the United Kingdom. While the reasons for success or failure in operating a new rail business are diverse, a common trait is that, in the absence of safeguards against unfair practices, new entrants face serious obstacles.

In particular, **new commercial operators still face discrimination in obtaining access to rail infrastructure and essential service facilities**, such as stations and maintenance workshops, which are often owned and operated by incumbents. Besides, incumbents may engage in anti-competitive behaviour or rely on cross-subsidies to keep competitors out of the market.

In 2015, two thirds of all EU passenger rail services were provided under PSCs, especially for regional and suburban traffic. This average hides significant differences across countries. In Denmark, Ireland, Greece, Croatia and Luxembourg, all passenger services are covered by PSCs. The use of competitive tenders for the award of these contracts is a key indicator of the degree of market opening. In the EU, the majority of PSCs are still awarded directly to incumbents. While the 4th Railway Package has introduced the principle of competitive tendering, it will take time (up to 2023) before the use of tenders is widespread.
In the **road transport** sector, the market for international (intra-EU) freight and passenger services has been entirely opened to competition, but domestic transport remains largely protected. On the **freight side**, 'cabotage', i.e. domestic transport performed by foreign hauliers, is subject to restrictions. As a consequence, operators face difficulties in optimising their operations and one in two vehicles operating domestic transport outside of its country of registration runs empty\(^\text{12}\).

The performance of national hauliers can to some extent be compared by looking at the shares of home-based vehicles in exports and imports from other EU countries. Under certain conditions a similar distribution of the transport activities between hauliers from the importing and hauliers from the exporting country might be expected. In reality, however, this is rarely the case in the EU.

Hauliers from some of the new EU countries, e.g. Poland, Bulgaria, Croatia and Romania are largely dominating the transport operations in the external trade of their respective countries. This reflects low labour costs.

The relative competitiveness of hauliers from the new EU countries also shows in their share in cross-trade (transport between two countries neither of which is the country of registration of the haulier): they account for 80% of all cross-trade in the EU. At the other end of the spectrum, hauliers from countries such as Sweden, France, Italy, Belgium and Denmark appear to be less competitive and have a relatively low market share when it comes to carrying the exports and imports of their own economies. With a combined share of less than 2% in total activity, these countries are more or less absent from the cross-trade market.

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On the passenger side, access to the domestic market continues to be heavily restricted in several EU countries. They shield incumbent monopolists from competition. However, liberalisation of long-distance coach services has been progressing in various EU countries: Sweden in 2012, Germany in 2013, Italy in 2014 and France in 2015.

As part of the initiatives of the second wave of the mobility package, the Commission proposes a Directive on Access to Passenger and Coach Services. The main objective is to enhance the accessibility and competitiveness of inter-urban regular services and to further open this market.

Europe's aviation sector has already benefited from the full market liberalisation for airlines. One of the main problems affecting its performance is the fragmented EU airspace that leads to high operating costs for airlines, as it limits the optimisation of flight paths or duplicating costly functions. As a consequence, in 2014 the unit costs for providing air navigation service were around 35% lower in the US than in Europe. Full implementation of the Single European Sky (SES) is a constant challenge given the resistance from many EU countries, often driven by social concerns.

In addition, major European airports are predicted to face a capacity crunch in the near future. It has been estimated that by 2035 there will be a surplus annual demand of some two million flights which European airports will be unable to accommodate due to capacity shortages. The Benelux countries, Germany and the United Kingdom risk having the highest unaccommodated demand in 2035. These two issues are seriously impeding the European aviation sector's ability to grow sustainably and compete internationally. Moreover, they are causing congestion, delays and rising costs.

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Challenges also include creating of a better market access and investment opportunities with non-EU countries and maintaining high EU safety, security and environmental standards. These are pre-requisites for a competitive aviation sector.

**Maritime transport** needs to overcome bottlenecks and act on administrative simplification, port capacity and efficiency, connection to the hinterland and access to financing. The lack of high-quality infrastructure or low-performing port services can result in significant extra costs for shippers, transport operators and consumers: for EU companies, port and terminal costs may represent up to 25% of the total door-to-door logistic cost. The 'Ports Regulation' of 2017 introduces rules on transparent public funding to improve market access and make port investments and port operations more efficient.

**Inland water transport** stands to lose its comparative advantage as an efficient, low external costs transport mode, unless long-term structural changes are made to improve the quality of its operating conditions. Suitable means are investment in better infrastructure, skills, digitalisation and integration into the logistics chain. This requires both the definition of common standards at EU level and cross-border cooperation between EU countries, e.g. in the framework of the Danube Strategy.

Another common challenge of market functioning is to create conditions of **fair competition** between the various transport operators in a market that is not distorted by illegal state aid or by abuses related to the control over infrastructure.

State funding of regional airports is often needed to ensure territorial cohesion. However, undue distortion of competition in subsidising economically unviable airports must be avoided. Sustainable growth of airports and airlines requires full compliance with state aid rules. Besides, there are claims of alleged unfair competition practices from air carriers of non-EU countries that threaten EU carriers.

As for maritime transport, the 'Ports Regulation' requires that financial relations between public authorities and the port managing body, or any other entity that provides port services or dredging and which are in receipt of public funds, must be reflected in a transparent way in the accounting system. Thus, the risk of undue cross-subsidisation is reduced.

On rail, cases of (restructuring) aid and overcompensation of public service obligations are frequent. In addition, failure to separate infrastructure managers and service operators is not conducive to fair competition or efficient exploitation of the infrastructure.

The Commission monitors the functioning of **transport services for consumers** in the Consumer Markets Scoreboard, which ranks over 40 consumer markets. Results of the 2015 survey show that train services continue to be perceived by the EU's consumers as one of the poorest performing service sectors (24th out of the 29 services markets surveyed in 2015), with the fourth highest incidence of problems.

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The heterogeneity of EU countries' scores is almost twice as high as observed for all services on average. Bulgaria, Croatia, Romania and Italy are at the bottom of the ranking.

While airline services are evaluated relatively well overall (4th place in the service markets ranking), a fifth of all cross-border complaints received by the network of European Consumer Centres relate to passenger or luggage transport by air. A Eurobarometer survey on passenger rights in all modes of transport shows that the level of public awareness (31%) has remained stable since previous surveys in 2005 and 2009 (on air passenger rights only).

On passengers with disabilities or with reduced mobility, 81% of those who requested assistance when travelling were satisfied with the assistance provided. The market for tram, local bus and metro services performs close to the service sector average (15th place).

On the social dimension, an ex-post evaluation of social legislation in road transport and its enforcement, carried out in 2015-2017, concluded that the rules in place do not effectively and efficiently address the risks of deterioration in working conditions and distortions of competition. This is due to shortcomings in the legal framework. Certain rules are unclear, unsuitable or difficult to enforce. This results in differences in implementation between EU countries of the common rules and creates a risk of fragmentation of the internal market. As part of the 'Mobility Package', the rules are currently being clarified and revised. This should clarify minimum standards for social protection and pay of posted workers in the (road) transport sector.

In the maritime sector, there has been progress since the entry into force of the Directive incorporating the 2006 International Labour Organization Maritime Convention in EU law. In aviation, the situation of highly mobile workers deserves attention. Whereas the 'home base' concept has been introduced into the Regulation on the coordination of social security systems in

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18 As measured by the standard deviation of the Market Performance Indicator (MPI).
20 Special Eurobarometer 420, December 2014.
2012\textsuperscript{23}, shortcomings remain as to clarifying rules on the applicable labour law for highly mobile workers and on the competent court in charge of disputes.

### 2.2. Infrastructure deficiencies

Since the global economic crisis, the EU has been suffering from **low levels of investment in transport infrastructure**. This has held back modernisation of the EU's transport system. Collective and coordinated efforts at European level, recently boosted by the Investment Plan for Europe, need to reverse this downward trend.

In particular the **trans-European transport network (TEN-T)** requires investment in new infrastructure, refurbishment and modernisation of the existing network. Better coordination is needed between EU countries on cross-border infrastructure projects.

While for some EU countries the main issue is to upgrade and maintain existing infrastructure, others need to develop or expand their transport network. The **availability and quality of transport infrastructure is particularly low in the Eastern part of the European Union**. Renovation and upgrading of an otherwise extensive railway network is also a fairly common challenge there. In the last two decades efforts have concentrated on completing the network of motorways.

**Building missing links at borders between EU countries** and along key European routes, removing bottlenecks or interconnecting transport modes in terminals is vital for the Single Market and for connecting Europe with external markets and trade partners. The smooth functioning of the European network requires integration and interconnection of all modes of transport, including equipment for traffic management and innovative technologies.

**Road and rail infrastructure across the EU has been degrading because of too little road maintenance.** Maintenance budgets have often experienced severe cuts and have not evolved in line with the increasing length of infrastructure and the ageing of crucial links. This has led to a worsening of the state of roads in many EU countries and has generated higher risks of accidents, congestion, increased noise and a reduced service to society.

The adaptation of infrastructure to new mobility patterns and the deployment of infrastructure for clean, alternative fuels, pose additional challenges that require new investments and a different approach to the design of networks and business models.

To address infrastructure bottlenecks on routes of key interest for the EU, suitable planning has to be put in place. Conditions have to be created to ensure **full absorption of funds earmarked in the Connecting Europe Facility** for rail projects in EU countries that are eligible for the Cohesion Fund. For instance, in the cases of the Baltic States and Poland, the Commission announced on 26 June 2017 almost half a billion euro for two projects on the global Rail Baltica project (EUR 110 million for the joint project by the consortium RB Rail, between Estonia, Latvia and Lithuania and EUR 338 million for the Białystok – Elk line).

In Greece, Spain, France, Italy and Portugal, further **improvement of port services and port hinterland connections** by rail (and/or inland waterways) is crucial. Rail investments to implement rail corridors and revitalise rail freight transport is a priority for Spain and Portugal.

The upgrading and modernisation of infrastructures is needed in the **inland waterway network** of Belgium, Germany, France the Netherland and Austria. Investments in the navigability of the Bulgarian, Hungarian and Romanian inland waterways, in particular the Danube, could remove significant bottlenecks in the EU transport network\textsuperscript{24}.


\textsuperscript{24} Cf. EU Rhine-Danube Corridor Work Plan, Danube Ministerial Declaration of June 2016.
In the light of a wave of **technological innovation and disruptive business models** (such as ride sharing), both the possibilities and demand for making transport safer, more efficient and sustainable have increased. Digital technologies help reduce human error. They can also create a truly multimodal transport system and spur social innovation. The market potential of **cooperative, connected and automated driving** is expected to lead to the creation of many new jobs.

**Cooperative intelligent transport systems (C-ITS)** allow road users and traffic managers to share information and use it to coordinate their actions. C-ITS are based on technologies which allow vehicles to 'talk' to each other and to the transport infrastructure. In addition to what drivers can immediately see around them, all parts of the transport system are in this way able to share information.

Communication between vehicles, infrastructure and other road users is also crucial to increase the safety of future automated vehicles and their full integration in the overall transport system.

Despite European initiatives, such as intelligent transport systems for road, the air traffic management system (SESAR) and the European Rail Traffic Management System (ERTMS), challenges emanate mainly from the fragmented deployment of C-ITS across EU countries. This creates barriers within the Single Market and can hamper the interoperability between different electronic systems and technological standards.

The deployment of intelligent transport systems for road and its interface with other modes varies across Europe. Yet, there are a number of common priorities and initiatives for collaboration among EU countries. Further commitment of all EU countries to the deployment of continuous and interoperable intelligent transport systems will be vital for tapping the full benefit that it can bring to the Single Market and the common transport area including economic and environmental benefits.

Given the regional specificities and differences in transport patterns, a possible indicator to compare the situation among the EU countries is the **index of satisfaction with transport infrastructure quality**. It is produced by the World Economic Forum for its Global Competitiveness Report (see Figure 5). It points out that the overall satisfaction with transport infrastructure is the lowest in the Central and Eastern European countries, namely Bulgaria, Poland, Romania, Slovakia and Slovenia, but also Greece and Malta score rather poorly. By contrast, Germany, Spain, Finland, France and the Netherlands rank the highest.
Analysis of the World Bank logistics performance index\textsuperscript{25} (see Figure 6) shows a slightly different ranking, but the overall picture is similar. One of the components of this composite index is the quality of trade and transport-related infrastructure (e.g. ports, railroads, roads, information technology). The index is again the lowest for Bulgaria and Romania. Croatia, Cyprus and Malta do not score much better. The best performing European countries are Germany, the Netherlands and Sweden.

It is worth adding that concerning the global logistics performance index, 23 EU countries are ranked in the top 50 out of the 160 countries compared by the World Bank, with Germany, Luxembourg, the Netherlands and Sweden occupying the first four places.

2.3. Low-emission mobility and negative externalities

The main external costs of transport are those linked to greenhouse gas emissions, local air pollution, congestion, capacity bottlenecks, accidents and noise. In particular, a strong impact of transport on energy use and climate change has to be addressed. In 2015, at least 33% of the final energy consumption and 24% of greenhouse gas emissions (23% more GHG emissions than in 1990) in the EU stemmed from transport\textsuperscript{26}.

Final energy consumption in transport\textsuperscript{27} decreased between 2005 and 2015 both due to the improvements in energy efficiency of passenger cars and to the economic crisis. The latter led to a stabilisation of passenger traffic and a decrease in freight traffic.

Under the adopted policies, the declining trend in emissions (since 2005) from transport is expected to continue until 2030 (-12% for 2005-2030)\textsuperscript{28}. The main drivers are fuel efficiency gains. They are encouraged by CO\textsubscript{2} standards for light duty vehicles, increasing fossil fuel prices over

\textsuperscript{25} The logistics performance index (LPI) is the weighted average of the country scores on the six key dimensions: efficiency of the clearance process, quality of trade and transport related infrastructure, ease of arranging competitively priced shipments, competence and quality of logistics services, ability to track and trace consignments, timeliness of shipments in reaching destination within the scheduled or expected delivery time. The LPI consists of both qualitative and quantitative measures.

\textsuperscript{26} Source: European Commission, EU Transport in Figures, Statistical Pocketbook 2017.

\textsuperscript{27} Excluding pipeline transport.

\textsuperscript{28} EU Reference scenario 2016, based on the PRIMES-TREMOVE transport model developed by E3M-Lab (ICCS/NTUA).
time, and the use of less CO₂-intensive fuels. Yet, greater efforts will be needed after 2020 if the global targets to reduce greenhouse gas emissions are to be met. It is expected that the cost of air pollution from road transport will remain high, also due to congestion and an expected growing demand for transport. Thus, the current transport system might not be sustainable.

CO₂ emissions and air pollution from transport are the major environmental concerns related to transport activity. The levels of CO₂ emissions are difficult to attribute to specific countries. They are calculated on the basis of fuels sold and do not correspond to the transport activity performed within the countries' borders. This leads to biased values especially for transit countries. In the case of maritime or air transport there are additional issues with attributing territoriality for emissions for the parts of the journeys taking place over a given territory.

Unlike other sectors, aviation emissions are forecast to increase dramatically as air traffic grows worldwide. CO₂ emissions have increased by about 80% between 1990 and 2014, and are forecast to grow by a further 44% between 2014 and 2035. The aviation industry, through research and innovation, and more efficient operations and air traffic management, has made some progress in addressing the sector's impact on the environment. However, such measures are not sufficient to keep pace with the growth of traffic.

Further, substantial societal and economic costs of transport are related to unsatisfactory safety in road transport. Despite a positive trend in the past years, in 2016, 25 500 people lost their lives on EU roads and a further 135 000 people were seriously injured. Until recently, the overall trend was close to the reference path to halving the number of fatalities in 2020 compared to 2010. The latest data indicate that the pace of improvement has stalled. The annual number of fatalities in the EU remained constant over the last three years.

The cost of road accidents to society is very high, especially taking into consideration that apart from road deaths, accidents also cause thousands of slight and serious injuries every year. For every death on Europe's roads there are an estimated 4 permanently disabling injuries, such as damage to the brain or spinal cord, 8 serious injuries and 50 minor injuries. The external costs of road accidents were estimated at 1.7% of GDP for 2008.

Congestion has to be dealt with urgently, considering the expected growth in transport demand. The indicator produced by the Joint Research Centre to evaluate the congestion level measures hours spent by cars in road congestion every year. The countries with the highest congestion level are Malta, the United Kingdom, Greece, Belgium and Italy (see figure 7).

Bearing in mind that current budgetary limitations do not allow for substantial investments, there is still scope for improvement in the way the existing infrastructure is actually used. A tool for fostering a more efficient use of roads is time-differentiated congestion charging. However, its application on EU roads today is marginal. Only five cities impose a congestion charge for accessing the city centres. On interurban roads, time-differentiated charges are applied to all vehicles only on a handful of short stretches of motorways in France and Spain, as well as on one motorway stretch in the United Kingdom. The Czech Republic also charges a higher toll on Friday evenings, but it applies only to heavy goods vehicles. While these schemes have proven to be effective in limiting peak-hour congestion, their coverage is insufficient to reduce the overall burden of congestion in the EU.

30 CARE (EU road accidents database) or national publications.
The **shift to alternative fuels vehicles** varies substantially across EU countries, although there is a general positive trend in most of the countries. The share of plug-in electric vehicles (PEV) in new passenger car registrations indicates the progress of deployment of electric cars. In 2016, according to the European Alternative Fuels Observatory, the Netherlands was in the lead, mainly owing to a large number of newly registered plug-in hybrid vehicles (PHEV). They represented almost 5% of the new registrations of passenger vehicles. It was followed by Sweden and Belgium. France and Austria have the highest share of battery electric vehicles (BEV) in new registrations. At the bottom of the scale are Greece, Bulgaria, Malta and Slovakia with 0.1% share of PEVs in new registrations of passenger cars.
3. IDENTIFICATION OF POLICY LEVERS TO ADDRESS THE CHALLENGES

Addressing the **gaps in the single European transport area** is expected to improve transport services in Europe. Thus it constitutes a prime policy lever for addressing the identified challenges. More specifically, for **rail transport** it primarily means:

- completing market opening;
- introducing the principle of competition for public service contracts;
- ensuring non-discriminatory access to infrastructure;
- reducing technical and regulatory barriers for market entry;
- the single signalling system;
- common passenger rights with fewer national exemptions;
- harmonised technical standards across Europe;
- and fair working conditions.\(^{32}\)

The **4th Railway Package** of 2016 aims to open up the market for rail passenger transport services. It establishes open access rights for railway companies in the EU from 2020 and lays down the principle of competitive awards for public service contracts. The policy focus will now have to be on effective enforcement of market opening and competition generation based on sectorial legislations and competition policy instruments.

For **road transport**, the proposed measures include:

- completing market opening;
- better enforcing existing rules;
- setting common vehicle standards;
- addressing road charging systems and technologies;
- making greater efforts for road safety;
- and addressing environmental sustainability and passenger rights issues. \(^{33}\)

On **social issues**, the Commission is launching initiatives to improve working conditions in road transport through the 'Europe on the Move' package. This includes a proposal\(^ {34}\) to clarify the application of EU rules on the posting of workers to the road transport sector.

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\(^{33}\) Ibid.

\(^{34}\) COM(2017) 278.
Following the successful liberalisation of air transport that has benefited EU consumers, action should now focus on:

- creating high quality jobs in aviation;
- protecting passenger rights;
- making the best use of innovation and digital technologies;
- and ensuring aviation’s contribution to a resilient Energy Union and climate change mitigation.

**Maritime transport** would benefit from:

- tackling direct state aid to terminal managers and maritime companies;
- liberalisation and transparency of port services;
- involvement of non-European ports in Motorways of the Seas;
- and proper emission taxation.

The establishment of a **European Maritime Single Window** environment, endorsed by EU countries in the ‘Valletta Declaration’ in 2017, is central to simplifying and harmonising of reporting formalities, reducing administrative and custom costs, and taking full advantage of digital means to optimise logistic chains.

**Inland waterway transport** requires policies addressing administrative and regulatory barriers, unused capacity and environmental externalities.

The quality and capacity of transport infrastructure will have to be improved to handle the expected growth in passenger and goods mobility. Given the likelihood that public funds will be limited, **increased investment from the private sector in strategic transport infrastructure** will be essential.

**Investment levels in infrastructure have been low since the financial crisis of 2008.** The cost of developing transport infrastructure in the EU is estimated at over EUR 1.5 trillion for 2010-2030. Completion of the **TEN-T core network** alone will require about EUR 500 billion until 2030. This compares with total investment of EUR 859 billion in transport infrastructure from 2000 to 2006. It is estimated that the completion of the TEN-T core network could spur the economy. It would create 1.8% additional GDP in 2030 compared to 2015 and 10 million jobs.

In 2017, the Commission agreed to invest EUR 2.7 billion in 152 key transport projects that support competitive, clean and connected mobility in Europe. In this way the Commission is delivering on its Investment Plan for Europe and on Europe’s connectivity, including the agenda set out in the Communication ‘Europe on the Move’.

Selected projects are mostly concentrated on the **strategic sections of Europe’s transport network (the TEN-T core network)** to ensure the highest EU added-value and impact. The largest part of the funding will be devoted to:

- developing the European rail network (EUR 1.8 billion);
- decarbonising and upgrading road transport, developing intelligent transport systems (EUR 359.2 million);
- and deploying air traffic management (ATM) systems (EUR 311.3 million).

This investment is made under the **Connecting Europe Facility (CEF)**, the EU’s financial mechanism supporting infrastructure networks. Over the period 2014-2020, it will unlock EUR 41.6 billion of public and private financing. The Commission is allocating EUR 11.3 billion from the CEF budget of the Cohesion Fund for the eligible 15 EU countries to further improve their infrastructure and reduce differences between countries. For 2014-

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36 Ibid.
37 Ibid.
38 OECD (2011), Strategic Transport Infrastructure Needs to 2030, Main Findings.
39 Report from the Commission to the European Parliament and the Council, on financial instruments supported by general budget according to Art 140.8 of the Financial Regulation as of 31 December 2015.
In 2020, these eligible 15 EU countries are: Bulgaria, the Czech Republic, Estonia, Greece, Croatia, Hungary, Cyprus, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.

Policies should take into account the fact that **EU countries have different infrastructure needs**. Increased investment in this field should take account of the investment pattern before and after the recent financial crisis. Policies that promote **spending in transport infrastructure encourage growth**, provided they do not create excess capacity. Providing too much infrastructure has been shown to create inefficiencies by diverting resources away from more productive investments. However, EU countries in which the stock of infrastructure is low, or has suffered from underinvestment, could certainly benefit from higher infrastructure investment. Efforts also have to be made to complete the multi-modal core network, which is the central part of the trans-European transport network policy.

There should be **more focus in all EU countries on developing and deploying of innovative infrastructure technologies and elements**. This will improve both a demand-based and sustainable provision of transport services and individual mobility. Based on the Commission's **intelligent transport systems (ITS) action plan** of 2008, a dedicated legal framework was established with the entry into force of the ITS Directive in 2010. This framework supports the harmonised deployment in the EU of ITS solutions in road transport.

In 2016, the Commission has presented a European strategy for the coordinated deployment of **cooperative intelligent transport systems (C-ITS)** to avoid a fragmented Single Market for cooperative transport and connected and automated driving. The strategy recommends actions to create synergies between different initiatives and improve interoperability. At the same time, it addresses the most critical issues, including cyber-security and data protection. More recently, the 'Europe on the Move' Communication (2017) discussed the role of C-ITS in enabling cooperative, connected and automated mobility. It highlighted the importance of developments in communication technologies and of **rolling out 5G**.

Under the **Horizon 2020** work programme 2016-2017, a dedicated call was launched for project proposals on **automated road transport**.

Furthermore, policies applying the 'user pays' and 'polluter pays' principles and monetary incentives to users, consumers and businesses, could help to reduce the **environmental impact and internalise the external costs** of transport.

**Infrastructure charging and taxes combined with innovative mechanisms to promote the financing of infrastructure for sustainable transport** can address the budgetary constraints for infrastructure maintenance and shape the mobility patterns and freight flows. Notably in road transport, a greater application of efficiently organised distance-based charges for road usage would create regular revenue streams for sustainable and efficient long-term maintenance and development of the network.

Greater use of the possibility to charge for external costs would help to apply the 'polluter pays' principle. However, the current **infrastructure charging and transport taxation schemes substantially differ among EU countries**, possibly creating **market distortions and inefficiencies**. The systems in place also treat some modes and fuels in a preferential way, leading to unsustainable mobility choices.

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43 Fraunhofer ISI (2015), Cost of non-completion of the TEN-T.
46 CE Delft (2008), Road infrastructure cost and revenue in Europe.
47 E.g. mark-ups applied on road charges.
Since the highest share of CO\textsubscript{2} emissions in transport comes from the road sector, it is also the area where EU countries have made the most effort to mitigate this impact. Yet, they often use different approaches. There is a need to provide consistent incentives to users to promote the most energy efficient trucks. An effective way would be to differentiate tolls according to the CO\textsubscript{2} performance of trucks. Other measures besides taxation that can address negative externalities consist in:

- deploying clean fuels for transport;
- deploying intelligent transport systems;
- setting efficiency standards for vehicles;
- sharing best practices (including eco-driving);
- and encouraging the use of more energy efficient transport modes, in particular collective transport.

These measures have been reiterated in the Communications 'A European Strategy for Low-Emission Mobility'\textsuperscript{49} and 'Europe on the Move'.

As part of the second wave of proposals of the mobility package, as mentioned in the introduction, the Commission proposes new CO\textsubscript{2} standards for cars and vans after 2020\textsuperscript{50} which will help Member States to achieve their 2030 climate and energy targets. The package also includes a revision of the Clean Vehicles Directive\textsuperscript{51} which will help to stimulate additional public demand for these vehicles in the EU and. Finally, the package contains an Action Plan to boost investment in alternative fuel infrastructure\textsuperscript{52} and develop a network of fast and interoperable recharging and fuelling stations across the Union.

In the maritime sector, environmentally differentiated port charges can stimulate investments in greener vessels.

4. EXAMINATION OF POLICY STATE OF PLAY

4.1. Market access policies

The single European transport area, as envisaged by the Commission, addresses the market functioning issues by opening the transport sector to competition in a harmonised manner. This does not exclude the need for action at national level. The EU economy would benefit from a lowering of market entry barriers and a reduction of the regulatory burden in transport markets.

Despite some progress, legal barriers to market entry persist in transport sectors in most EU countries. The latest OECD product market regulation data (see Figure 9) which estimate the restrictiveness of market regulations show that the situation has improved in air passenger transport in almost all countries for which data are available. It remained broadly unchanged for road freight\textsuperscript{53} compared to 2008. Rail transport remains the sector with the most restrictive regulations: administrative, technical and regulatory burdens are still present in most of the countries\textsuperscript{54}.

A good example of the positive impacts of deregulation can be found on the long-distance coach market, where various countries have opened their markets (Sweden in 2012, Germany in 2013, Italy in 2014 and France in 2015). Positive developments are already visible, especially in Germany, where coach travellers doubled to 16 million a year after the market opening (all but 4 million on domestic routes) and accounted for 11% of the public-transport market. Cross-border travel has also surged.

Despitess some progress, the implementation of the functional airspace blocks is still not satisfactory in most of the countries in the EU. There are still infringement procedures against 21 Member States participating in six of the nine functional airspace blocks. The procedures concern lack

\textsuperscript{49} COM(2016) 501.
\textsuperscript{50} COM(2017) 676.
\textsuperscript{51} COM(2017) 653.
\textsuperscript{52} COM(2017) 652.
\textsuperscript{53} The OECD data do not indicate any improvement of the situation in the road freight sector following the adoption of Regulation (EC) No 1072/2009 on common rules for access to the international road haulage market, OJ L 300, 14.11.2009.
\textsuperscript{54} OECD (2013), Product Market Regulation Database.
of optimal provision of navigation services and the use of airspace (Bulgaria, Denmark, Estonia, Latvia, Romania, Finland and Sweden excluded).

4.2. Investment in transport infrastructure

The level of investment in transport infrastructure and maintenance is difficult to compare between EU countries due to non-harmonised and incomplete reporting. Besides, it has to be matched with the actual investments needs. The latest OECD data (2015) indicate that investment levels in most countries remain at low levels. Most EU countries have a share of total transport infrastructure investment below 1% of GDP\(^5\). It is a safe assumption that this does not cover the investment needs (also due to the maintenance requirements) in most countries.

The Connecting Europe Facility, the European Fund for Strategic Investments and cohesion policy (through the Cohesion Fund and the European Regional Development Fund) intend to address these budgetary deficiencies. They help in constructing the TEN-T core transport network and support infrastructure projects of high economic importance and relevance for the internal market. However, EU countries will still need to develop infrastructure for the last leg of the network which is critical for the incorporation of large infrastructure projects in the local transport systems.

The length of the trans-European core road network completed at the end of every year, compared to the total, including planned sections and sections to be upgraded, can give a rough indication of the progress of trans-European transport network policies in the EU countries. While for some countries the investments have already been completed (Spain, Portugal, Slovenia, the United Kingdom), others still have a lot to do. This concerns mainly Central and Eastern European countries, and in particular Estonia, Lithuania, Poland, Slovakia and Romania\(^6\).

The latest national reports\(^7\) (August 2014) demonstrate the strong and constant involvement of most EU countries in intelligent traffic management and information systems. These allow for a better use of the infrastructure, in particular through better use of road, traffic and travel data and the development of new intelligent transport services for traffic and freight management. In addition, new open data strategies for transport (e.g. in the United Kingdom) or the use of crowd-sourcing (e.g. travel-time information in Finland) have led to significant changes and the development of new services.

The national reports also highlight a growing trend towards more and more cooperative intelligent transport systems and driver-less piloting activities in EU countries (e.g. France, Germany, the Netherlands, Austria, Finland, Sweden and the United Kingdom).

Although significant investments have been made into intelligent road transport systems, monitoring and evaluating their impact in the EU countries continue to be fragmented. Pan-European consolidation is insufficient.

4.3. Promoting shift to low-emission mobility and addressing negative externalities

EU countries offer various incentives to promote the deployment of electric vehicles, such as purchase subsidies, registration tax benefits, ownership tax benefits, company tax benefits, VAT benefits and other financial benefits, local incentives and infrastructure incentives. In most countries there is a clear relationship between the incentives offered and an increase in the number of plug-in electric vehicles. Unsurprisingly, in countries where there are no incentives available i.e. Bulgaria, Estonia, Poland and Slovakia, there is a low propensity to buy electric cars\(^8\).

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\(^7\) [http://ec.europa.eu/transport/themes/its/road/action_plan/its_national_reports_en.htm](http://ec.europa.eu/transport/themes/its/road/action_plan/its_national_reports_en.htm)

\(^8\) European Alternative Fuels Observatory 2017. [http://www.eafo.eu/eu#eu_incentives_over_table_anchor](http://www.eafo.eu/eu#eu_incentives_over_table_anchor)
The introduction of schemes to internalise the external cost of transport, implying a broader application of the 'polluter pays' principle, needs to be promoted and encouraged in all EU countries. The Commission has launched a comprehensive study 'Sustainable transport infrastructure charging and internalisation of transport externalities', which will assess infrastructure charges, other internalisation measures as well as infrastructure-related expenditure. In addition, EU countries should be encouraged to use the possibility offered by Directive 2011/76/EU to collect external-cost charges from heavy goods vehicles on top of the infrastructure charges.

With the exception of a few front running countries, the uptake of alternative fuels for all transport modes needs to be improved, in a harmonised and synchronised way. The aim is to avoid technological islands, push for economies of scale and ensure cross-border mobility. An ambitious implementation of Directive 2014/94/EU would be a way to deploy an alternative fuels infrastructure with common standards.

Road charging on European roads is not systematically or effectively applied. 14 EU countries apply distance-based charges (tolls) to heavy goods vehicles and 8 to private cars on (some) motorways. Other EU countries still use time-based vignettes. 10 EU countries have vignettes for heavy goods vehicles and 7 for cars, for the latter essentially applied on motorways only. In addition, the systems vary in terms of network coverage, charge levels and other conditions. This provides unclear and uncoordinated incentives to users. With very few exceptions tolls are levied electronically. Yet the systems are not mutually interoperable. All these differences create administrative burden and unnecessary costs for hauliers and tourists. Systems do not necessarily take account of the environmental impact of vehicles. Tolling schemes which apply to heavy goods vehicles differentiate charges according to the air pollutant emissions of the vehicles, but the same is not true for road charges applying to passenger cars.

EU countries could and should make better use of the possibility to support the shift of freight transport from road to more sustainable transport modes, as offered by the Combined Transport Directive. Considering its fragmented and uneven implementation in EU countries, the Commission has proposed an amendment to the Directive on 8 November 2017.

Despite the comparatively good provision of infrastructure in the Benelux countries, Germany, Malta and the United Kingdom, these countries suffer from a high level of road congestion. They must deal with high and increasing costs for the maintenance of their extensive transport infrastructure. This calls for a more balanced exploitation of all transport modes. This can be achieved through better and more flexible technologies and service solutions (especially the deployment of intelligent transport systems) and appropriate pricing for the use of infrastructure.

All EU countries need to continue their efforts to improve road safety. The poor safety record in Bulgaria, Latvia, Lithuania, Poland and Romania calls for more effective measures to be urgently implemented.

61 Most EU countries have at least one or two pieces of special infrastructure, such as bridges or tunnels, which are tolled.

Transport fuel taxes can encourage fuel efficiency and a more sustainable use of cars, including the use of more sustainable fuels. The structure of such duties needs to reflect both the carbon and energy content of fuels. Currently, substantial differences in tax rates on fuels can be observed across EU countries. There is a general preferential treatment of diesel. Diesel is taxed less than petrol in almost all EU countries.

Transport taxation may have a significant effect on consumers’ preferences when purchasing a car. This includes registration tax (levied on the purchase of a car) and vehicle road tax (levied annually on car ownership). Registration of a car is subject to a tax in 20 EU countries, and 22 apply vehicle road taxes.

Registration taxes are currently dependent on CO\textsubscript{2} emissions in 15 EU countries. 12 countries take emissions into account in the rate of circulation taxes payable on different vehicles. Bulgaria, the Czech Republic, Estonia, Lithuania, Poland and Slovakia are among the countries where vehicle taxation based on CO\textsubscript{2} emissions would be welcome.

However, neither registration taxes nor road taxes affect the marginal cost of using a vehicle. Moreover, the absence of harmonisation of registration taxes at EU level can create a significant administrative burden and sometimes double taxation when vehicles are transferred to another country.

The share of environmental taxes in total transport taxation can indicate only to some extent how the taxation system addresses transport externalities. There are other factors affecting the decision how to tax transport/vehicles and it is more the design of the system than the absolute tax levels that have a greater influence on the behaviour of motorists.

Favourable tax treatment of company cars is a practice that needs to be considered when looking at the internalisation of environmental costs. Several EU countries subsidise the private use of company cars.

Belgium, Ireland, Estonia, and Latvia allow a partial deduction of the VAT charged on the purchase of company cars intended for private use by employees. Advantageous company car schemes tend to encourage car ownership and often affect the choice of model and driving habits. Recent Commission proposals are seeking to address these problems.

Date: 14.11.2017

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64 European Commission, Tax Reforms in EU Member States 2015, Institutional Paper 008 | September 2015.
65 Ibid.
## STATISTICAL ANNEX

### Table 1 – Access to market and market performance

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**Note:** Top five scores in green, bottom five scores in red, where relevant to provide ranking. In the case of the indicators of market share on non-incumbents, performances under 3% are highlighted. If not otherwise specified, data are derived from European Commission sources. (*2014)
Table 2 – Infrastructure

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</tbody>
</table>

Note: Top five scores in green, bottom five scores in red, where relevant to provide ranking. If not otherwise specified, data are derived from European Commission sources.
<table>
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<td>156.8%</td>
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<td>1.7%</td>
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<td>130.3</td>
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<td>99.4%</td>
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<td>58.8%</td>
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<td>0.1%</td>
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<td>5.2%</td>
</tr>
<tr>
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<td>39.4%</td>
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<td>168.5</td>
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<td>5.9%</td>
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<tr>
<td>Luxembourg</td>
<td>32.2</td>
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<td>127.5</td>
<td>168.9</td>
<td>95.3%</td>
<td>56.2%</td>
<td>1.8%</td>
<td>4.6%</td>
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<td>Hungary</td>
<td>27.3</td>
<td>6.2%</td>
<td>129.6</td>
<td>176.9</td>
<td>39.0%</td>
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<td>Malta</td>
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<td>112.9</td>
<td>148.9</td>
<td>51.2%</td>
<td>5.1%</td>
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<tr>
<td>Netherlands</td>
<td>30.2</td>
<td>5.3%</td>
<td>101.2</td>
<td>163.2</td>
<td>75.7%</td>
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<td>Austria</td>
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<td>123.7</td>
<td>178.3</td>
<td>71.2%</td>
<td>50.1%</td>
<td>2.1%</td>
<td>4.7%</td>
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<tr>
<td>Poland</td>
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<td>129.3</td>
<td>175.2</td>
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<td>7.4%</td>
<td>105.7</td>
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<td>64.4%</td>
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<td>Romania</td>
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<td>United Kingdom</td>
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<td>178.0</td>
<td>33.2%</td>
<td>28.4%</td>
<td>2.0%</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

**Note:** Top five scores in green, bottom five scores in red, where relevant to provide ranking. If not otherwise specified, data are derived from European Commission sources.
Indicators presented in the tables

Table 1 – Access to market and market performance

**OECD regulatory restriction indicators:** The selected indicators are the OECD indicators of regulation in energy, transport and communications (ETCR). They summarise regulatory provisions in air passenger transport and road freight transport (2013). The index scale ranges from 0 – least restrictive to 6 – most restrictive. The data are collected every 5 years.

**Market share of all but the principal undertakings:** The total market share of all but the principal railway undertakings, for both freight and passenger transport (2015, source: European Commission - DG MOVE) can be considered an indicator of the level of competition in the rail sector. Not applicable to Cyprus and Malta.

**Labour productivity:** Apparent labour productivity – gross value added per person employed in the transportation and storage sector (NACE rev. 2 section H) (data for 2015; source: Eurostat).

**Performance of the passenger transport markets:** The selected indicator is the 'market performance indicator' (MPI). It indicates a country's rank among the other countries for a specific market in 2015, as perceived by users, related to train, airline and the local public transport services. MPI is a composite index reflecting five main aspects of consumer experience: (1) the ease of comparing offers, (2) consumer trust in retailers/providers to comply with consumer protection rules, (3) the experience of problems and the degree of detriment suffered, (4) overall consumer satisfaction and (5) choice of offers available (Source: European Commission).

**Share of home-based vehicles in tonne-km generated in exports to and imports from other EU28 countries:** This indicator measures the relative competitiveness of a country's road haulage sector in the EU via the share of vehicles registered in the reporting country in total tonne-km generated when goods were exported from or imported to that country by road to/from another EU country (2016, source: Eurostat).

Table 2 – Infrastructure

**Logistics performance index:** The selected indicator is the World Bank's logistics performance index (World Bank, 2016). LPI ranks countries on six dimensions of trade - including customs performance, infrastructure quality, and timeliness of shipments. The data used in the ranking comes from a survey of logistics professionals. They are asked questions about the foreign countries in which they operate.

**Quality of infrastructure:** The selected indicators are the indices of satisfaction with respect to road, rail, seaports (for landlocked countries' accessibility to seaport facilities) and air transport infrastructure quality. They are part of the World Economic Forum Global Competitiveness Report 2017-2018 (1 = extremely underdeveloped/ among the worst in the world; 7 = extensive and efficient/ among the best in the world; weighted average; period covered 2016-2017). Based on the Executive Opinion Survey.

**Density of the motorway network:** Per 1000 km² of territory and per 1000 inhabitants (2015, source: European Commission).

**Density of the railway network:** Per 1000 km² of territory and per 1000 inhabitants (2015, source: European Commission).
Km of high-speed rail lines: For EU countries with high speed rail infrastructure, the length of lines, but not a ranking, has been provided (2016, source: European Commission).

Total inland transport infrastructure investment: Investment and maintenance spending on transport infrastructures (road, rail, sea ports and airports) as% of GDP (2015, source: OECD). It should be underlined that data for this indicator are not completely harmonised. Different categories of investments and maintenance could be included depending on the country. The coverage is partial for some countries. The data are collected on a voluntary basis. Furthermore, high values are not necessarily associated with a positive performance and would have to be compared to the actual investment needs (e.g. in the case of 'catching-up' countries).

Table 3 – Environmental and social dimension

Congestion: Average annual hours spent in congestion per vehicle (2015, source: JRC based on TomTom data).

Deployment of clean transport technologies: The selected indicators are the share of Renewable Energy Sources (RES) in transport (2015, source: Eurostat).


Share of electrified railway lines over total lines in use: 2015, source: European Commission.

Road safety: The number of road fatalities per million inhabitants (2016, source: European Commission – CARE database).

Transport taxation: Revenues from environmental taxes on transport (fuel and other taxes) as% of GDP and total taxation revenues (2015, source: European Commission).

PEV market share in new passenger car registrations: Plug-in electric vehicles (PHEV+BEV), M1 category of vehicles (2016, source: European Alternative Fuels Observatory).

Charging points per 100 000 inhabitants in (peri-)urban areas: Total number of electric vehicle charging points divided by the population in urban areas and/or peri-urban areas. It is assumed that most of the charging points are installed in urban areas. (2017, source: European Alternative Fuels Observatory).