Measure 44: Trans European Network projects

First page:

Policy package: **1B:** Road investment and technologies **2B:** Rail investment and technologies **3B:** Air investment and technologies **4B:** Sea and inland waterway investment and technologies package
Measure 44: In 2001 revise the trans-European network guidelines in order to eliminate bottlenecks by encouraging corridors with priority for freight, a rapid passenger network and traffic management plans for major roads, and adding to the "Essen" list other projects. In 2004 present a more extensive revision of the trans-European network aimed in particular at integrating the networks of the accession candidate countries, introducing the concept of "motorways of the seas", developing airport capacities and improving territorial cohesion on the continental scale.
What is the problem being addressed ? Measures 44 is a very complex and composite measure as it addresses the priority projects to be implemented at the level of enlarged EU up to year 2020, being strongly linked to: • *Eliminating bottlenecks*. Measure 44 contributes to the elimination of the bottlenecks by encouraging projects addressing both up-grading and building of new infrastructure for all transport modes, by improving capacity, increasing the LOS and making possible higher level of interoperability of the rail and inland waterways networks of the Member States. • *Revitalise railway.* More than 80% of the projects of the High Priority List published by the European Commission on 1st October 2003 address railways, for both passengers and freight. The strong development of rail infrastructure will make possible the development of fast and efficient (rail) travel alternatives to road and/or air transport. • *Shifting the balance between modes of transport*. Measure 44 contributes to shifting the balance between modes of transport through rail projects addressing passengers and/or freight. Regarding the passenger transport, the new HSR projects contributes to the shift from air to rail of relatively long distance traffic in Europe, while the rail projects addressing directly or indirectly freight will contribute to a shift from road to rail of flows of goods. Inland waterways projects, as well as the "sea-motorways" projects contribute to the shift from road to these alternatives modes. • *Linking up the transport modes*. Measure 44 creates more opportunities for a better integration between transport modes. • *Road safety.* All transport projects proposed on 1st October 2003 contribute, in an indirect manner, to the improvement of road safety. First of all the transfer of passengers and freight from road to alternative modes reduces the road traffic flows thus the risks of accidents. Secondly, the new motorways projects contributes to road safety by transferring flows from the secondary network, which is always some more unsafe than the motorways, to the new motorway sections. In this sense, the measure should encourage a switch to more efficient and cleaner forms of transport including better organisation and logistics, as required by the 6th Community Environment Action Programme, and also according to the Air Quality Framework Directive (96/62/EC) and to the Council Decision 2002/358/EC (greenhouse emissions). Moreover, it should take into account the Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, the Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (as last amended by Directive 2003/35/EC of the European Parliament and of the Council), Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (as last amended by Regulation (EC) No 807/2003) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as last amended by Regulation

(EC) No 1882/2003 of the European Parliament and of the Council).

Measure's costs and/or benefits:
EUR 225 billion up to 2020, of which EUR 80 billion by 2006 – following COM(2003) 564 final

Legislative implementation at the EU level:
Decision No 884/2004/EC of the European Parliament and of the Council of 29 April 2004 amending Decision No 1692/96/EC on Community guidelines for the development of the trans-European transport network. The list of priorities contains the following projects:

- *Extension of project No 1 along the railway axis Berlin-Verona/Milano- Bologna-Napoli-Messina-Palermo*
- *Extension of project No 3 along the high-speed railway axes of south-west Europe*
- *Extension of project No 6 along the railway axis Lyon-Trieste/Koper-Ljubljana- Budapest-Ukrainian border2*
- *Extension of project No 7 along the motorway axis Igoumenitsa/Patra-Athina- Sofia-Budapest*
- *Extension of project No 16 along the freight railway axis Sines-Madrid-Paris*
- *Extension of project No 17 along the railway axis Paris-Strasbourg-Stuttgart- Wien-Bratislava*
- *Extension of project No 18 along the Rhine/Meuse-Main-Danube inland*
- *waterway axis3*
- *Extension of project No 20 along the Fehmarn Belt railway axis*
- *Project No 21: Motorways of the sea*
- *Project No 22: Railway axis Athina-Sofia-Budapest-Wien-Praha-*
- *Nürnberg/Dresden5*
- *Project No 23: Railway axis Gdansk-Warszawa-Brno/Bratislava-Wien6*
- *Project No 24: Railway axis Lyon/Genova-Basel-Duisburg-*
- *Rotterdam/Antwerpen*
- *Project No 25: Motorway axis Gdansk-Brno/Bratislava-Wien9*
- *Project No 26: Railway/road axis Ireland/UK/continental Europe*
- *Project No 27: "Rail Baltica" railway axis Warszawa-Kaunas-Riga–Tallinn*
- *Projet No 28: Eurocaprail on the Bruxelles-Luxembourg-Strasbourg railway axis*
- *Projet No 29: Railway axis on the Ionian/Adriatic intermodal corridor*

What are the objectives ?
While the single priority projects are the object of careful ex-ante and ex-post evaluation usually based on state of the art Cost Benefit Analysis (CBA) and project monitoring indicators, meaningful indicators to track the overall progress of all the priority projects together shall include the development of the TEN-T infrastructure by mode (e.g. length of road, rail, inland waterways, number and capacity of ports and airports), total investment by mode and estimates of total costs. These data are currently provided by the DGTREN-PLANCO Study TEN – Invest which collected data in the EU15 and candidate countries and provides an inventory of technical TEN-T infrastructure data for roads, railways, inland waterways, and major ports and airports, as well as investment data (see second page). Further, one could assess how each project and/or group of projects shall contribute to these aggregate figures and to each of the WP objectives presented above. A list of indicators has been developed in the Phase 2 of the TEN-STAC projects in order to assess the impact of each project. The list of indicators is given in the Annex. The level of objective achievement (for year 2005) shall be given by the level of realisation of the planned investment up to year 2005 correlated to the progress of the work for the infrastructure projects considered in this time frame.

Interactions with other WP measures:
Measure 28 addresses the development of the infrastructure needed to build veritable "motorways of the sea". This measure is actually part of measure 44 too, being identified as priority project No 21. Measure 44 is also strongly interacting with measure 36 (*Improving the situation of inland waterway transport through eliminating bottlenecks, establishing links to rivers and installing transhipment equipment*), measure 45 (In 2001 increase to 20% the maximum funding under the trans-European network budget for

the main bottlenecks, including those still remaining on the Union's frontiers with the accession candidate countries, and then introduce conditionality rules), and measure 74 (Link the future Member States to the EU's trans-European network by means of infrastructure of quality with a view to maintaining the modal share of rail transport at 35% in the candidate countries in 2010 by mobilising private-sector finance).
However, due to the scale of application of the measure 44, links with many other measures can be identified for specific segments of the transport market. In this respect, there are measures complementary to measures under discussion now and measures that have an overlap with measures 44 for specific transport modes.

Second page:

Output indicators:

Key output indicators of TEN-T programmes can be computed at the country level using in particular the database developed in the context of the DGTREN-PLANCO study. This database includes data collected in the EU15 and candidate countries, and provides in-depth information on:

Technical status of TEN transport infrastructure for:
- **Road network** (motorway, high quality road and ordinary road): length, number of lanes per direction, speed limit (if any), agent responsible for construction and maintenance.
- **Railway network** (high-speed lines, upgraded high-speed lines, conventional lines): length, type of traffic (passenger, freight or mixed), whether or not the line is designated for intermodal transport, type of traction and if electric the voltage, the number of tracks and the track gauge, the minimum loading gauge and the maximum axle load, the maximum speed and length of train, the type of command/control system in use.
- **Inland waterway network** (four ECMT classes): length, type of waterway (regulated river, channel, perennial river), number of single and double locks and the maximum draught, maximum height for containers.
- **Ports**: type of port (maritime, inland or a combination of the two), maximum draught of the approach channel, the existence or otherwise of transhipment facilities for short sea shipping and intermodal transport, the type of throughput (passenger, freight) and latest operating statistics, whether the port is connected to the Trans-European network and if so, by what kind of mode.
- **Airports**: type of airport (international, Community connecting point, regional), latest operational statistics covering freight and passengers, total capacity, the number and length of the runways and the operating hours, whether the airport is connected to the Trans-European network and if so, by what kind of mode.

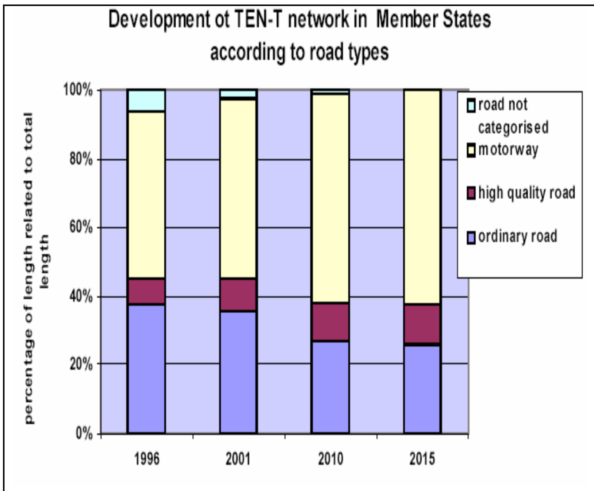
Investments in TEN transport infrastructure for road, rail, inland waterway, ports, airports (where financial data for technical measures were not provided, investments were estimated using unit costs).

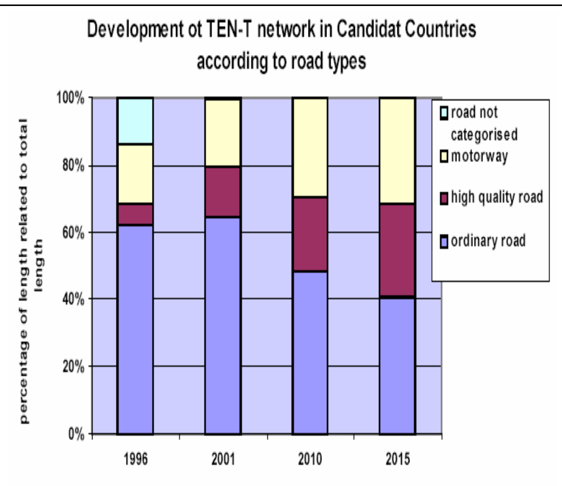
Financial support from TEN-T budget and other sources of finance (see Measure 45).

A number of TEN-T implementation indicators can be computed based on these data. However, data to compute capacity as the maximum traffic flow (vehicle-kilometres in a given time unit) that can be carried by transport infrastructure are not available. Therefore, the length of transport infrastructure by type (e.g. motorways, roads, railways and navigable inland waterways) is usually taken as a proxy indicator for capacity of road, rail and inland waterways.

The heading indicators and examples of application taken from the DGTREN – PLANCO Study are presented below.

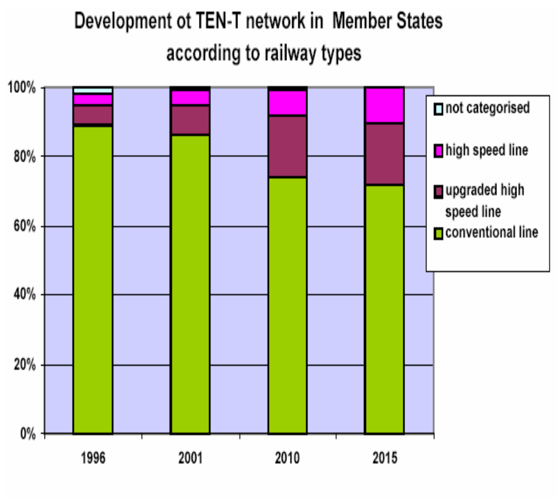
- Development of TEN-T road network according to road types

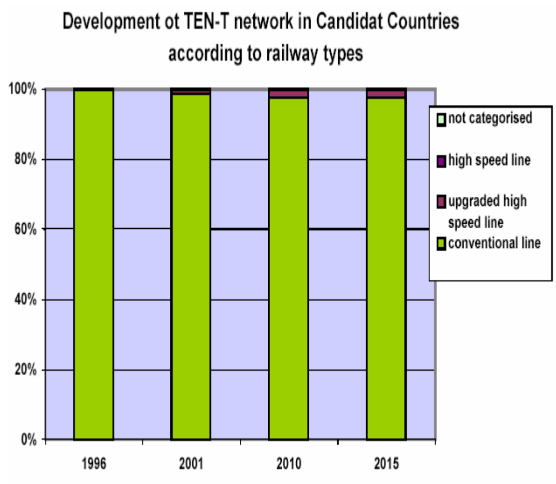




While infrastructure length is only a proxy measure for capacity, the steady increase in the length of the road infrastructure between 1990 and 1999 (with motorways growing by 31%), while the length of conventional railways lines and inland waterways decreased (around 2% and 4% respectively), suggests that road capacity has expanded to the detriment of rail and inland waterways.

- Development of TEN-T rail network according to railway types





In 1999, the rail network was about 153000 km long, of which in 1998 49% was electrified. Although the length of the network has been falling for several decades, it is difficult to estimate the effect on capacity. The total track length (single, double and more) has declined since 1990, suggesting that minor lines have been closed. The length of high-speed rail track more than tripled between 1990 and 1999. In 2001, only 2800 km of high-speed railway lines were in service, and it is expected that the completion of the 12600 km network will take 10 longer than planned, i.e. until 2020.

- Development of TEN-T inland waterway network according to ECMT classes (see also Measure 36)

The inland waterways network is about 28000 km long and decreased slightly in length (2%) between 1990 and 1998.

- Total investment in TEN-T infrastructure

Table 6-1: Total Investments in TEN-T Infrastructure, Member States, million Euro

Country	1996/1997	1998/1999	2000/2001	2002/2003	2004/2005	2006/2010	TOTAL
Austria	881.6	1,352.5	853.5	1735.6	1414.6	2428.1	**8,666.0**
Belgium	5,077.1	5,673.1	3,514.6	2,270.3	2,144.0	4,310.2	**22,989.3**
Denmark	2,715.1	4,474.0	1,365.8	145.1	77.2	71.7	**8,848.8**
Finland	747.7	911.6	700.2	1,014.9	1,129.5	1,747.9	**6,251.8**
France	6,199.3	11,243.2	8,756.6	10,794.3	8,042.8	9,435.2	**54,471.4**
Germany	12,561.8	14,251.0	9,654.5	13,087.7	8,851.8	13,187.5	**71,594.3**
Greece	2,216.1	2,507.5	2,797.7	2,603.7	2,521.2	1,679.5	**14,325.7**
Ireland	514.6	837.8	1,964.0	3,470.5	2,671.2	1,509.1	**10,967.3**
Italy	3,764.6	8,826.3	9,422.3	15,825.4	11,834.5	16,448.6	**66,121.6**
Luxembourg	79.9	59.6	109.7	159.8	159.8	399.6	**968.5**
Netherlands	3,953.4	5,273.8	9,863.9	10,689.8	8,551.3	6,188.8	**44,521.0**
Portugal	1,128.3	1,187.4	1,280.6	1,101.3	533.5	216.8	**5,448.0**
Spain	3,084.6	5,183.2	5,077.4	9,457.5	9,471.6	16,803.0	**49,077.3**
Sweden	1,558.7	1,283.2	631.5	1,700.9	1,953.8	2,548.0	**9,676.2**
United Kingdom	1,318.0	6,095.2	7,697.4	12,335.7	13,554.0	20,629.8	**61,630.2**
Total	**45,800.8**	**69,159.4**	**63,689.8**	**86,392.6**	**72,911.0**	**97,603.8**	**435,557.4**

Table 6-2: Total Investments in TEN-T Infrastructure, Candidate Countries, million Euro

Country	1996/1997	1998/1999	2000/2001	2002/2003	2004/2005	2006/2010	2011/2015	TOTAL
Bulgaria	27.0	147.7	263.5	291.1	264.3	312.5	261.5	**1,567.6**
Cyprus	18.7	74.2	129.7	168.5	214.4	231.2	0.0	**836.6**
Czech Republic	356.6	468.3	1,467.6	2,650.2	2,936.1	4,125.1	1,537.5	**13,541.5**
Estonia	2.9	118.8	106.2	169.3	177.5	195.9	0.0	**770.7**
Hungary	25.1	168.2	823.3	1,563.2	1,365.6	2,016.2	469.9	**6,431.5**
Latvia	14.0	63.4	39.1	37.6	68.0	149.2	37.1	**408.4**
Lithuania	1.2	147.6	117.7	234.3	379.9	642.2	441.9	**1,964.8**
Malta	0.0	51.5	15.5	63.6	81.0	77.6	20.0	**309.2**
Poland	162.3	490.4	833.8	1,463.3	4,365.7	9,503.1	39.8	**16,858.4**
Romania	42.7	106.3	155.3	135.4	173.9	195.8	192.6	**1,002.0**
Slovakia	56.9	48.7	18.5	885.6	1,312.3	2,459.2	1,313.0	**6,094.3**
Slovenia	291.7	412.3	572.2	680.2	717.1	846.2	174.4	**3,694.2**
Total	**999.0**	**2,297.4**	**4,542.5**	**8,342.3**	**12,056.0**	**20,754.3**	**4,487.6**	**53,479.2**

Investments in the TEN-T network in EU15 Member States between 1996 and 2001 amounted to 178,6 billion Euro. Between 2002 and 2005, expenditure of a further 159 billion Euro is foreseen, while the planned expenditure between 2006 and 2010 is at 97,6 billion Euro. In the Candidate Countries, investments of 7,8 billion Euro were reported between 1996 and 2001. The highest share was in the Czech Republic (29%) followed by Poland (19%), Slovenia (16%) and Hungary (13%). Future expenditure of 20 billion is projected for the period 2002 – 2005. However, it has to be noted for the Candidate Countries that no road investment data were available for Bulgaria and Romania. For inland waterways, Bulgaria, Polonia and Romania are missing, for ports Slovakia and Slovenia, and for airports, Poland.

- Share of investment by mode

Figure 6-1: Share of investments by mode, Member States

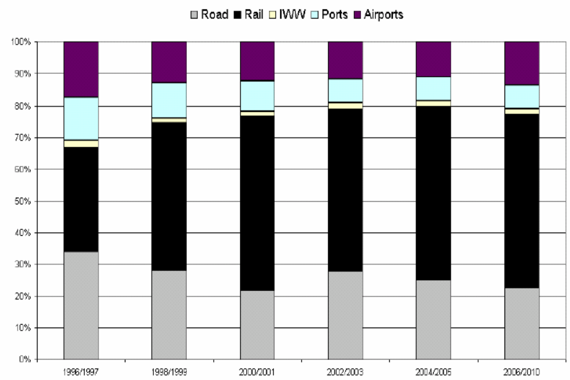
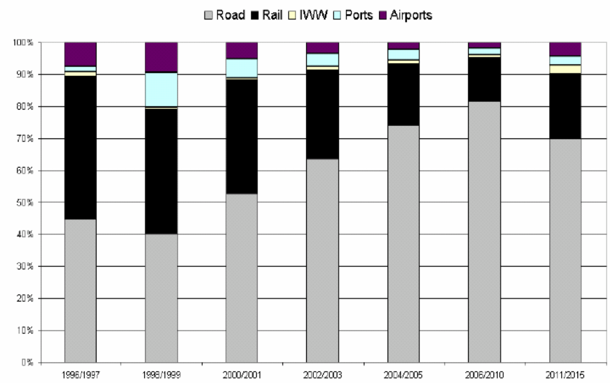


Figure 6-2: Share of investments by mode, Candidate Countries

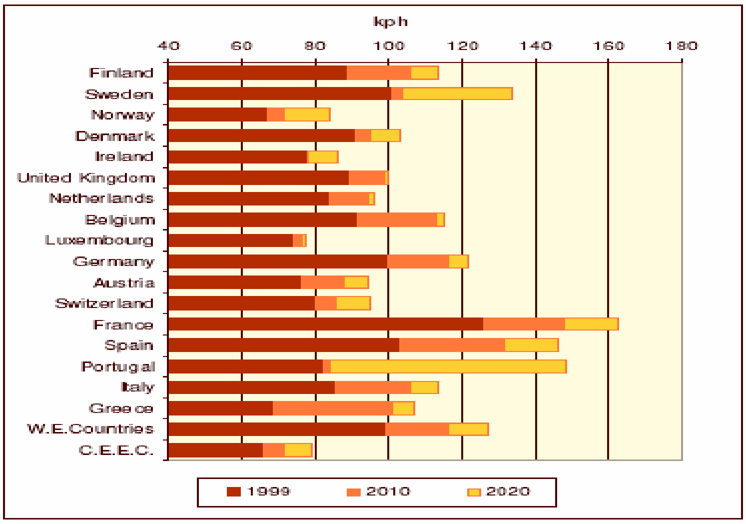


In the period concerned, the highest share of investments in the EU15 Member States is assigned to rail infrastructure (33% - 55%), followed by road infrastructure (22% - 34%). The lowest share was invested in inland waterways (1% - 2%), though it should be noted that there are only six out of 15 Member States with river systems which are interconnected: Austria, Belgium, France, Germany, Luxembourg and the Netherlands. In the Candidate Countries, by far the largest amount of investments, 61% on average, goes into road infrastructure. Rail infrastructure accounts for 28% of the total. Funds allocated to airports and ports represent 5% and 4% respectively. Inland waterways account for an average of only 1% of the total investment.

- Total TEN-T budget support per type of network infrastructure investment (see Measure 45).

A direct output of the implementation of TEN's rail priority projects will be an increasing average speed of rail services for international passenger transport. A core segment is High Speed Rail, which will reduce travel times consistently. According to the UIC 2002 study[1], travel times in rail passenger traffic are falling drastically as a result of the ongoing extension of the High-Speed Network and new HS services. The figure below shows the average commercial speed in the rail networks (weighted by demand). In 2020, the average commercial speed in the Western Europe countries is expected to increase to 127 kph (on average for every traveller) compared to about 100 kph in 1999.

Average Commercial Speed for long-distance rail traffic in 1999, 2010 and 2020



Source: UIC 2002

Outcome indicators: intermediate impacts on transport markets

The availability of a Trans-European Transport Network as well as new technological possibilities will obviously affects transport demand. The growth or decline of transport demand for the different transport modes, which obviously depend also from manifold demographic and socio-economic drivers, will contribute to determine the viability of single transport market segments and ultimately of the TEN-T infrastructure investments. Many of the Trans European Corridors are aimed to handle freight as well as passengers, and the former seems more relevant. So the key market indicators that catch the effect of implementing the TEN priority projects (often been influenced by the implementation of other measures) shall consider in particular the impacts of the new infrastructure on the shift from road to other modes of passenger transport and those on freight flows in total and by transport mode:

- Modal shift from road to other modes expressed in passenger kilometres and tonnes kilometres
- External trade (export/import) EU25 by transport mode, in tonnes per year ;
- Internal trade EU25 by transport mode, in tonnes per yea;
- Goods transport EU25 – share by transport mode.
- Shift in intermodality (tonnes per segment of the market per transport chain).

In the TEN-STAC study the indicators enumerated above can be identified by comparing two scenarios: the project only implementation scenario and all priority projects implementation scenario. To estimate these indicators the situation before and after the implementation of the priority project shall be assessed. For example, in the TEN-STAC the transport performance of the by transport mode has been estimated as:

Traffic performance EUROPEAN+ scenarios 2020, EU27 (in billion passenger km & ton km)

[1] INTRAPLAN, IM Trans, INRETS, Passenger Traffic Study 2010/2020, on behalf of the International Union of Railways (UIC), February 2003

EU27	Base year 2000				EUROPEAN+ 2020			
	Total	**% m-s**	**Int'l**	**% m-s**	**Total**	**% m-s**	**Int'l**	**% m-s**
Passengers								
Car & coach	4,864	87%	339	55%	6,410	85%	437	46%
Railway	417	7%	35	6%	530	7%	62	6%
Air	299	5%	243	39%	564	8%	459	48%
Total passengers	5,580	100%	617	100%	7,504	100%	958	100%
Growth 2000 - 2020					34%		55%	
Freight								
Road	1,145	68%	412	58%	1,959	66%	808	58%
Railway	376	22%	187	26%	767	26%	412	30%
Inland waterways	152	9%	112	16%	263	9%	188	13%
Total goods	1,673	100%	711	100%	2,989	100%	1,408	100%
Growth goods 2000 – 2020					79%		98%	
Growth in GDP 2000 – 2020					62%		62%	

The growth of transport performance by mode is given by the general growth of transport demand under specific assumptions regarding the evolution of tariffs by mode and level of implementation of infrastructure projects. Because the market indicators enumerated above give only an aggregated picture of the effect of implementation of priority projects, a better indication is given by the country-to-country flows by mode.

Outcome indicators: final impacts on transport users and non users

The most notable impact on transport users is the total time saving achievable thanks to the transport network capacity improvement and reduction of bottlenecks on the Trans-European transport networks.
As it concerns the external impacts, favourable impacts on emissions (CO_2, NOX, Particulates) are expected as a result of shifting flows of passenger and goods from road to other modes, thanks to the improvements of rail, sea and inland waterways links at least in some parts of Europe.