



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 19.2.2004  
SEC(2004) 220

**COMMISSION STAFF WORKING PAPER**

**TRANS-EUROPEAN TRANSPORT NETWORK**

**Report from the Commission to the European Parliament, the Council, the European  
Economic and Social Committee, and the Committee of the Regions**

**ON THE IMPLEMENTATION OF THE GUIDELINES FOR THE PERIOD  
1998-2001**

Pursuant to Article 18 of Decision 1692/96/EC

# COMMISSION STAFF WORKING PAPER

## Implementation report 1998-2001

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## EXECUTIVE SUMMARY

### The period covered

Article 18 (3) of Decision 1692/96/EC on the TEN-T guidelines requires the Commission, with the assistance of the Member States, to report every two years on the guideline's implementation. A first report covering the period 1996-1997 was presented in 1998.

The Commission began work on a new implementation report for the period 1998 to 1999, but at meetings of the TEN-T committee in November 2001 and May 2002 it was clear from the draft paper presented that substantial data had not been provided to the Commission and that, without such data, it would not be possible to produce a valid report.

It was therefore agreed at the TEN-T committee meeting of May 2002 that the report would cover a four-year period, from January 1998 to December 2001, and that a consortium of consultants would be employed to assist the member states and the accession countries in the collection of the requisite data. This report brings together that work.

### The Policy Framework

During the period covered the Commission issued a major policy paper, the White Paper "European Transport Policy for 2010: time to decide" (September 2001), which advocates a change in the orientation of the Common Transport Policy based on the wish to maintain the modal transport split as it was in 1998.

Also, as a follow-up to the Gothenburg European Council of June 2001, which called for greater priority for rail, inland waterways, short-sea shipping, intermodal transport and the corresponding connections, the Commission proposed a revision of the guidelines for the trans-European network in October 2003, accompanied by an assessment of the impact of the measures proposed. The proposal, with a time horizon of 2020, reinforces the priority given to the first series of projects, takes stock of progress, and responds to new challenges with plans for new priority projects and tools to tackle the problems of implementing cross-border projects ('European coordinators' and a 'Declaration of European Interest'). Furthermore, in November 2003, the 'Initiative for Growth' identified certain sections which are the most ready to be taken up and implemented in order to boost investment in the EU.

### Implementation

The results of implementation from 1998 to 2001 could be characterised as "solid progress, but needs to be better".

The total investment in the network over the period was around €129 billion, nearly €90 billion higher than for 1996-1997. Furthermore, in line with Community policy, twice as much was invested in rail than on roads. In fact, more than half of all investment was on rail projects. This compares to the period 1996-1997 when the share of road and rail was almost equal. However, these figures do not represent a decline in road investment – it has remained constant - but rather the fact that most of the additional money has gone to rail.

Although this shift in the balance of investment is encouraging, the same cannot be said for the total amount invested. It is estimated that since 1996 only €172 billion has been spent. At this rate of investment, the target of building the network by 2010 will not be achieved.

### The next steps

Therefore, despite significant progress made much remains to be done. The development of the TEN-T remains one of the major challenges for the European Union. The enlargement of the Union will increase the importance of the Network as a means of opening up the Union to the acceding countries and building links between them and those states that find they have a border with, or are a transit country for, the EU.

## **1. INTRODUCTION**

This report provides an assessment of the development of the trans-European transport network (TEN-T) following the TEN-T guidelines set out in Decision 1692/96/EC. The guidelines are addressed primarily to the Member States and, where specified, to the Commission. They constitute a general reference framework for the implementation of the network and identify projects of common interest which are to be completed by 2010.

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Following the publication of the first report the Commission began work on a new implementation report for the period 1998 to 1999. At the meetings of the TEN-T committee in November 2001 and May 2002, the Commission presented a draft paper. It was clear that substantial data had not been provided to the Commission and that, without such data, it would not be possible to produce a valid report.

Consequently, it was agreed at the TEN-T committee meeting of May 2002 that the report would cover a four-year period, from January 1998 to December 2001, and that a consortium of consultants would be employed to assist the member states and the accession countries in the collection of the requisite data. This report brings together that work<sup>1</sup>.

Chapter 2 begins with an overview of TEN-T policy while Chapter 3 considers the main developments on the modal networks of the TEN-T, as outlined in Annex I of the guidelines Decision: road; rail; inland waterways and ports; seaports; combined transport. This is followed by a look at the horizontal issues of interoperability, research and development, and environmental protection.

The section on Community funding, Chapter 4, provides an overview of the financing of the TEN-T, with particular reference to financial support from the EU during the reference period.

Chapter 5 looks at the development of specific projects.

In Chapter 6 there is a general assessment of the development of the TEN-T during the period in question. The main findings are that for the period 1998-1999 global investment in the TEN-T was around €65.7 billion, as against €63.7 billion in 2000-2001. This gives a total of €129.3 billion over the reference period of 1998-2001.

Chapter 7 examines the extension of the network to third countries, be they accession or candidate countries.

## **2. TEN-T POLICY**

In September 2001, the Commission adopted its White Paper “European Transport Policy for 2010: time to decide”. In the light of worsening congestion and the growing external costs of

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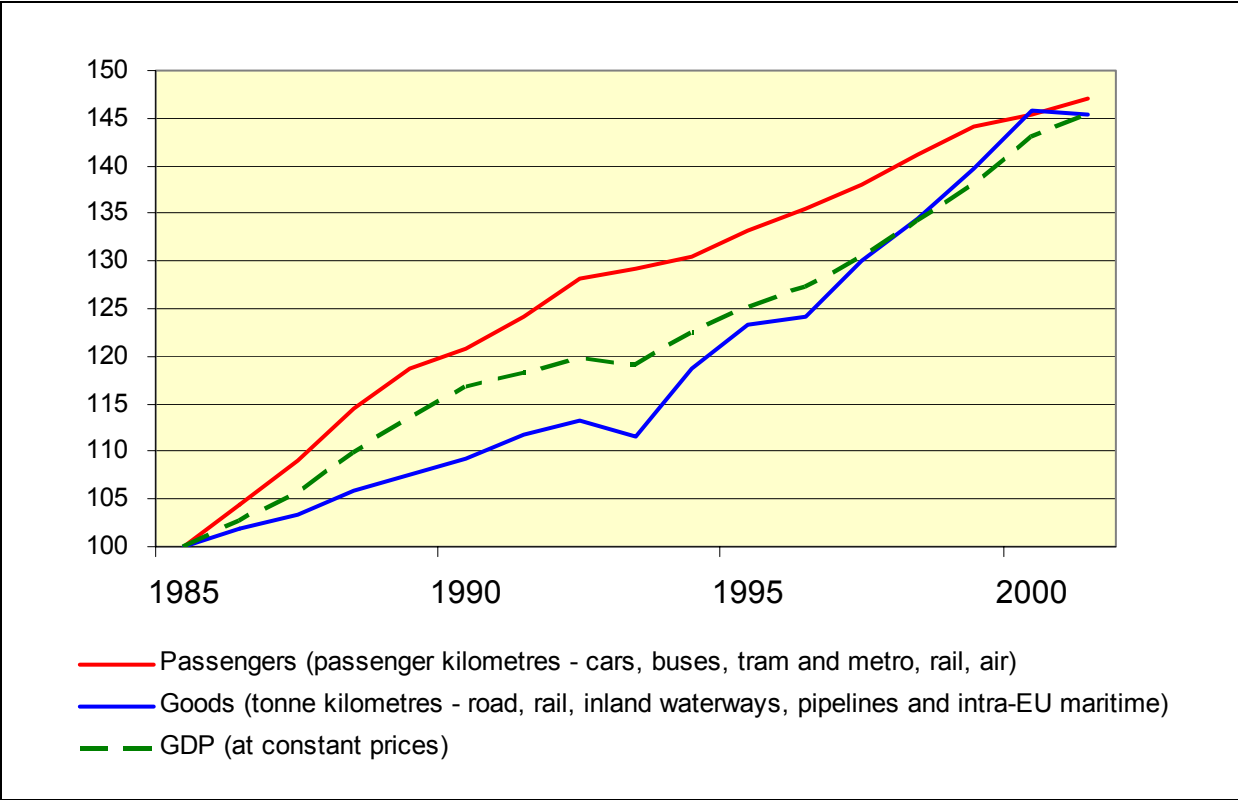
<sup>1</sup> The Commission has requested Member States, in the frame of the TEN-T Committee, to confirm their national data in this report.

transport, it advocated greater emphasis in the Common Transport Policy on modal shift as the way to sustainability, following the conclusions of the Gothenburg Council, and based on the objective of maintaining the modal transport split as it was in 1998.

The White Paper pointed out that in the EU “some 7500 km, i.e. 10% of the road network, is affected daily by traffic jams”. The Paper also foresaw an annual growth rate of 1.8% for passenger transport and 2.8% for freight transport in the EU, leading to an overall increase in passenger transport of 24% and in freight traffic of 38% between 1998 and 2010.

When the White Paper was published the economy was slowing down after four years of growth. However, the trends the White Paper set out to counteract are structural and lead to the predominance of road transport, even with lower economic growth. Unless changes in policy are made congestion is set to increase further, reducing the Union’s welfare and competitiveness.

**Figure 1:** Transport growth in the European Union, 1985-2010 (1985=100)<sup>2</sup>



The White Paper also announced that the Commission would propose a Directive<sup>3</sup> on the interoperability of toll systems in order to support the overall pricing policy to be implemented between 2001 and 2010. This Directive is of paramount importance to interoperability and continuity of service on the trans-European road network.

<sup>2</sup> Source: EU energy and transport in figures – statistical pocketbook; White Paper: European transport policy for 2010: time to decide, COM(2001)370 final.

<sup>3</sup> Communication from the Commission “Developing the trans-European transport network: Innovative funding solutions, Interoperability of electronic toll collection systems, Proposal for a Directive of the European Parliament and of the Council on the widespread introduction and interoperability of electronic road toll systems in the Community”, COM(2003)132.

In October 2001 the Commission proposed a revision of the guidelines for the trans-European network.<sup>4</sup> This proposal reinforced the priority given to the first series of projects, took stock of progress, and responded to new challenges with plans for six new priority projects, including deployment of the Galileo satellite system and the crossing of the Pyrenees by rail. It also raised such horizontal priorities as a rail network for freight.

This proposal was a follow-up to the call from the Gothenburg European Council of June 2001 for greater priority for rail, inland waterways, short-sea shipping, intermodal transport and the corresponding connections. The proposal was approved by the European Parliament but no agreement has so far been reached with the Council.

To finance the aim of concentrating on the main goals of the TEN-T development, the Commission presented on 2 October 2001<sup>5</sup> a proposal to revise the Regulation of the European Parliament and of the Council amending Council Regulation (EC) No 2236/95 laying down general rules for the granting of Community financial aid in the field of trans-European networks. The Commission proposed an increase in the maximum rate of Community support, in exceptional cases, from 10% to 20% for cross-border rail projects crossing natural barriers which represent obstacles to the free movement of passengers and goods and require the construction of long tunnels/bridges or the removal of specific infrastructure bottlenecks in areas close to border regions with acceding countries. No agreement was reached with the Council on this issue.

On 22 May 2001, Decision No 1346/2001/EC<sup>6</sup> was adopted by the European Parliament and the Council, amending the TEN-T guidelines as regards seaports, inland ports and intermodal terminals, thus emphasising the multimodal dimension of the network.

The TEN-T revision of 2001 was intended as a first step. On 1 October 2003, the Commission adopted proposals to revise the guidelines of the TEN-T network and the financial regulation.<sup>7</sup> The Commission proposals follow the main lines recommended by a High Level Group on Trans-European Transport Network chaired by former Commissioner Mr Van Miert and comprising representatives from the current and future Member States.

The new proposal, with 2020 as the time horizon, has a particular focus on enlargement and the need to integrate the networks of the acceding countries. The proposal also aims at ensuring modal shift and more sustainable mobility patterns by focusing investments on rail and maritime transport – Motorways of the Sea are included among the new priority projects proposed. Following the difficulties related to the implementation of cross-border TEN-T projects, often leading to unequal project development, the proposal includes mechanisms to improve coordination between Member States: the designation of ‘European coordinators’ and a ‘Declaration of European Interest’. The main change in the financial regulation is the proposed possibility of granting financing up to 30% for cross-border sections of European projects.

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<sup>4</sup> COM(2001)544

<sup>5</sup> COM(2001)545 amended by COM(2002)134. Amended by the EP on first reading in July 2002.

<sup>6</sup> Decision No 1346/2001/EC amending Decision No 1692/96/EC as regards seaports, inland ports and intermodal terminals as well as project No 8 in Annex III (Official Journal 2001, L 185/1)

<sup>7</sup> COM(2003)564

### 3. IMPLEMENTATION BY MODE AND SECTOR

#### 3.1. Modal networks

This section examines the main developments in the modal networks of the TEN-T, as outlined in Annex I of the guidelines Decision.

##### 3.1.1. Road network

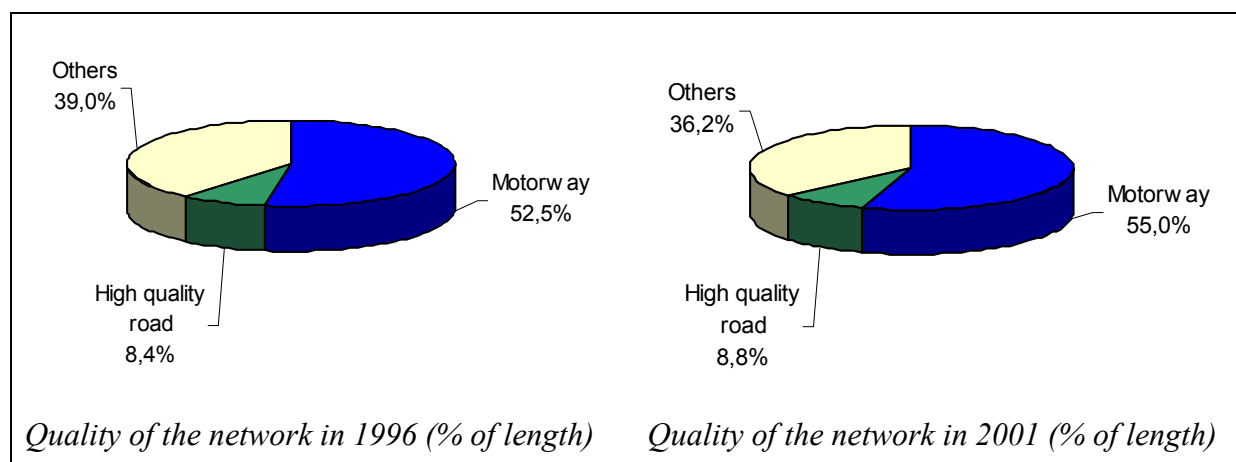
In 1999, the primary road network in the EU comprised some 320 000 km of motorways, highways and main or national roads<sup>8</sup>. The TEN road network includes some 75 200 km, accounting for less than a quarter of the total length of EU primary roads. However, the existing TEN road network has a crucial role to play in securing the free movement of goods in the European Union, carrying about 40% of all road freight traffic.

The guidelines define the TEN road network as composed of motorways and high-quality roads, existing, new or to be adapted. The total length of already existing motorways and high-quality roads has increased from slightly more than 39 000 km in 1996 to around 44 000 km in 2001, representing almost two thirds of the network. The remaining third is still to be constructed or upgraded to the general target in the guidelines.

Figure 1 shows the global improvement in the general characteristics of the network, while figure 2 presents the development of the network in terms of length per country.

Figure 3 details the changes in the quality of the TEN-T road network per country. It has to be noted that only the improvements that have led to a change of category of a section (from high-quality road to motorway, for instance) are represented in this figure. Further significant developments in the network that cannot be represented in an aggregated graph like figure 3 have to be reported. They are linked to improvements in transport conditions (capacity – such as the construction of additional lanes on a motorway, - safety, etc.) without increasing the length of the TEN-T road network or changing the category (motorway, high-quality road) of the section.

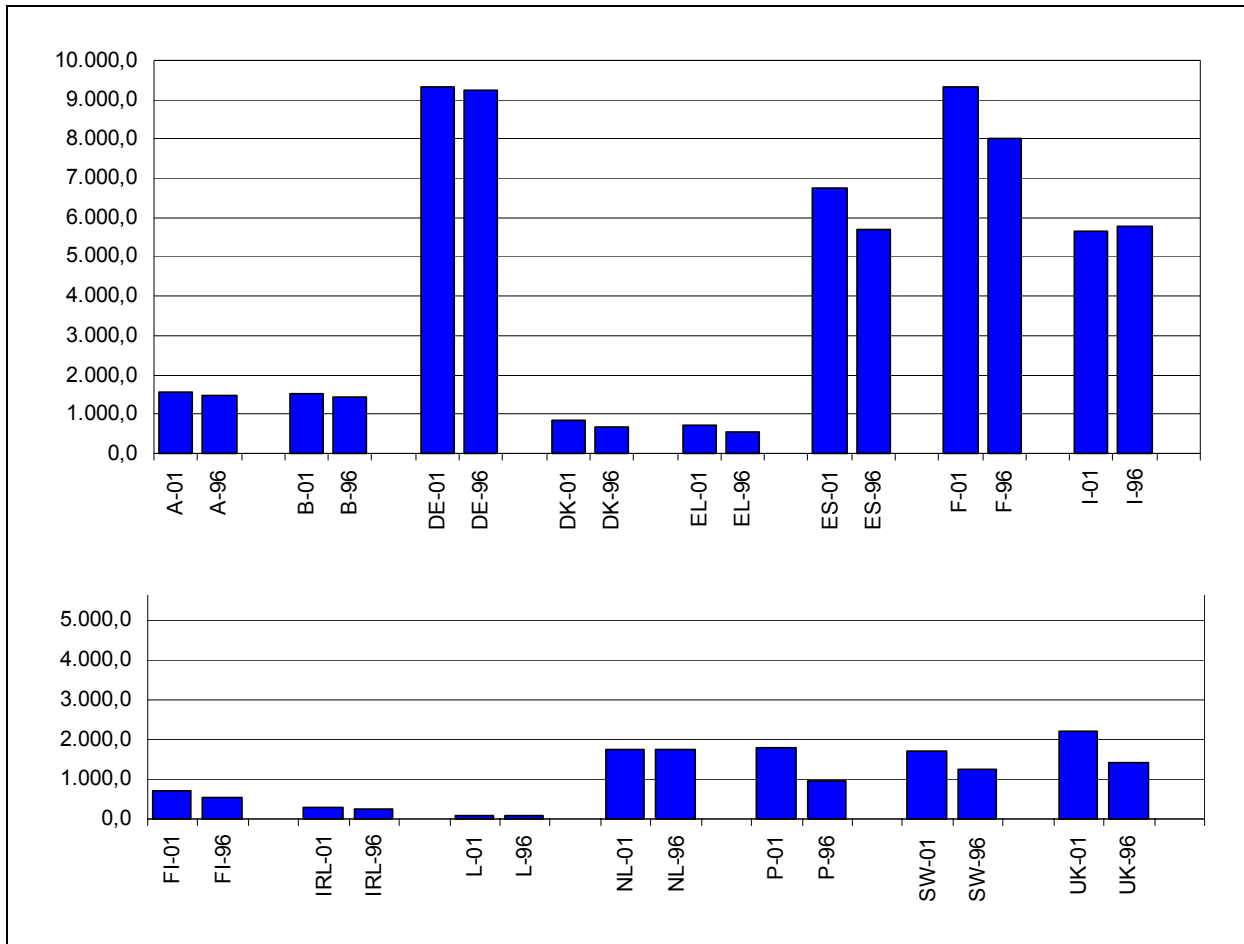
**Figure 2:** Development of quality of the TEN-T road network until 2001 (% of km per category of road link)



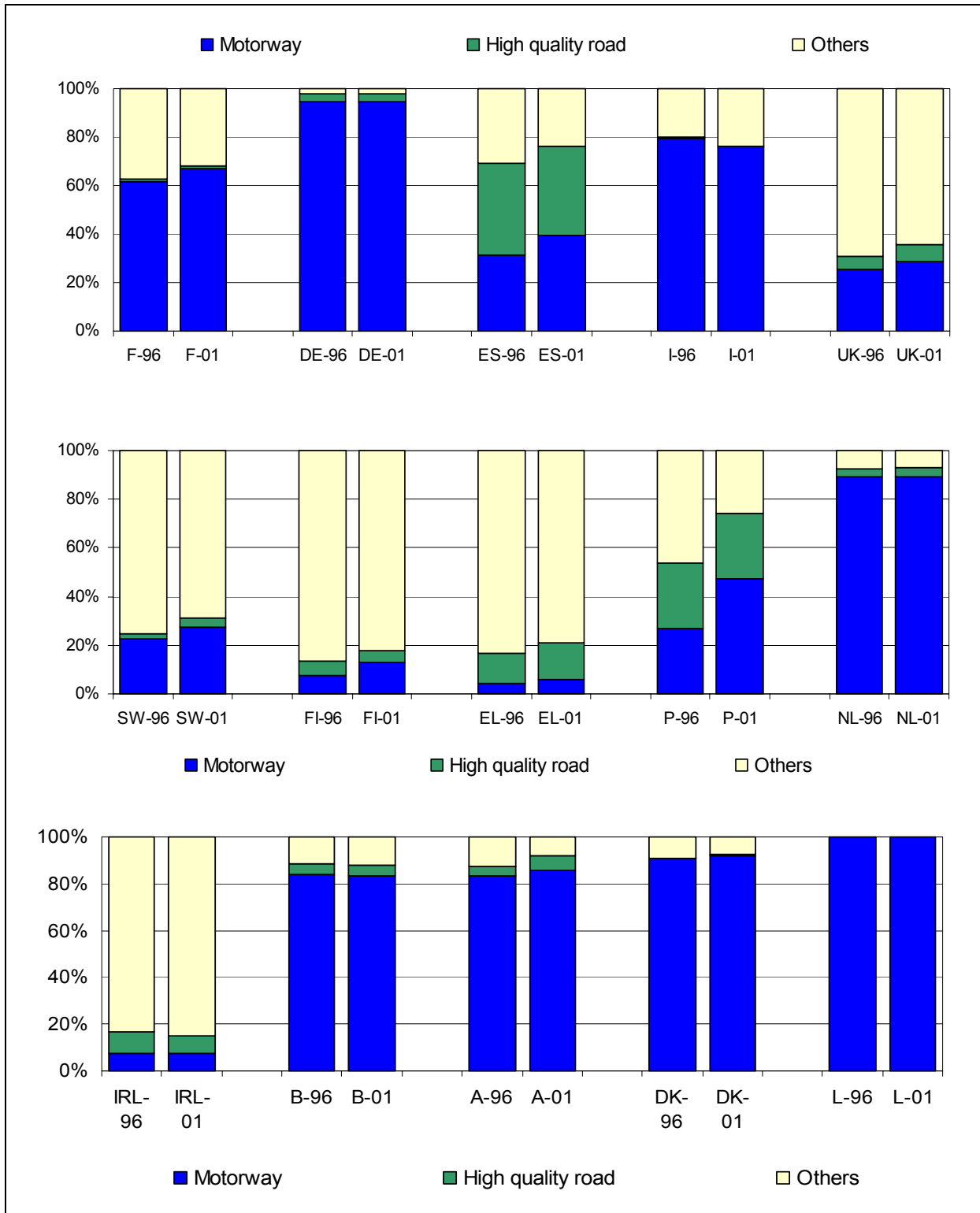
<sup>8</sup> Source: European Union Transport & Energy in figures, statistical pocketbook 2002, European Commission, Directorate-General for Energy and Transport in cooperation with Eurostat.



**Figure 3:** Development of the length of the TEN-T road network (motorways and high quality roads) until 2001 (in km per country)



**Figure 4:** Development of the quality of the TEN-T road network by country until 2001

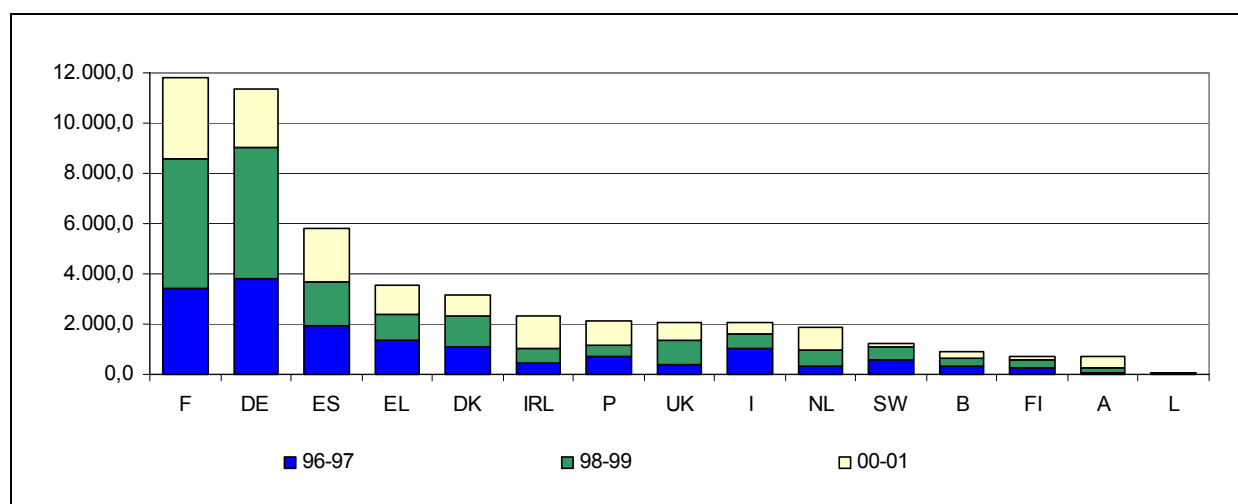


The investment in the TEN-T roads from 1996 to 2001, leading to the improvements depicted, has amounted to €49.7 billion. In 1998-2001, the period described in this report, investment amounted to €34.0 billion, thus remaining almost stable if compared with efforts in 1996-1997. France and Germany together accounted for almost half of the amount (46.9%), followed by Spain (11.4% of the total investment), Greece and Denmark (6.5% and 6.0% respectively). Over half of the total investment was related to motorways.

Any estimate of the total cost of implementing the TEN-T road network has to be approached with caution. The target defined in the guidelines is flexible and a significant share of projects of common interest involve improving transport conditions, even in the case of already existing motorways, whose cost is difficult to include in advance in the statistics. Keeping in mind all the uncertainties, the total cost of the network can be estimated at around €120 billion (see annex on methodology and availability of data).

Given the investments already made before 2001 of slightly below €50 billion, if the current rhythm of investment were to be maintained, the target established in the guidelines for 2010 could be achieved in general terms.

**Figure 5:** Investment in TEN-T road network by country in 1996-2001 (in million €)



The following examples illustrate the progress achieved in 1998-2001:

- The completion of the Øresund bridge, a fixed rail/road link between Denmark and Sweden with a four-lane motorway running above a double-track railway. Project number 11 of the Essen list of specific projects included in Annex III to the guidelines. The Øresund link went into service on schedule in July 2000. The total investment, including the access routes, amounted to €4.2 billion; TEN-T support in the period 1995-2001 was €127 million.
- The advancement in the creation of the "Pathe/Via Egnatia" motorway network. Project number 7 of the Essen list of specific projects included in Annex III to the guidelines. By the end of 2001, Egnatia had achieved 50 per cent completion (some 340 km out the 680 that constitute the whole project), and Pathe has been completed to 60 per cent (some 460 km out of the 774 that make up the whole project).

- The progress in the United Kingdom and Ireland in the framework of priority project number 13 – Ireland/United Kingdom/Benelux road link; in Portugal and Spain in the framework of priority project number 8 – Multimodal link Portugal-Spain-Central Europe (Oporto-Vigo, Valladolid-Salamanca, Benavente Verin motorways); and in Sweden and Finland in the framework of priority project number 12 – Nordic triangle (rail/road) (E18 motorway in Finland, E4, E6 and E18 roads in Sweden).

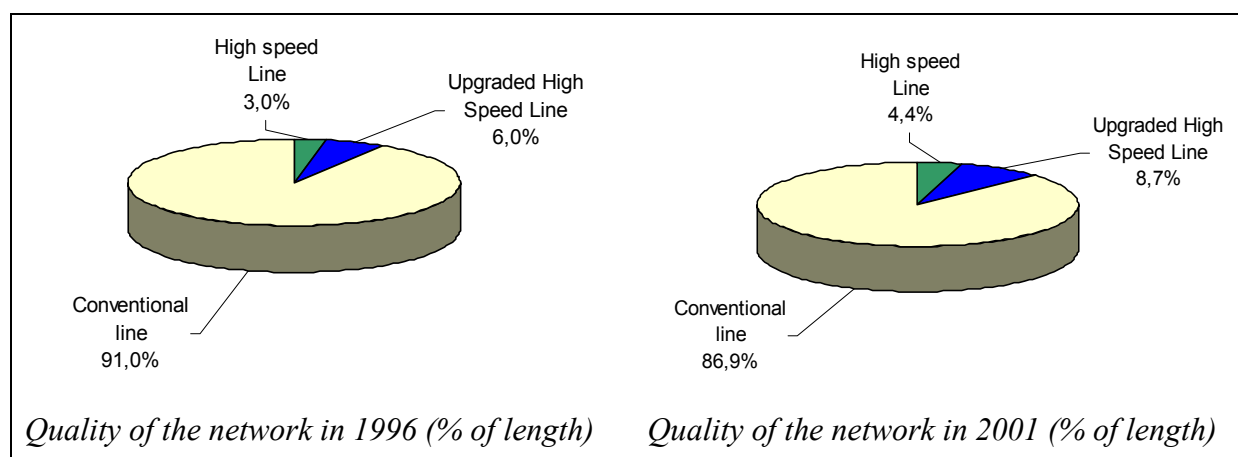
### 3.1.2. Rail network

The rail networks of the 15 EU Member States have a total length of 156 000 km,<sup>9</sup> of which some 78 000 km are designated in Annex I of the guidelines as the trans-European railway network. This infrastructure is used to move more than half of the rail freight traffic. The target in the guidelines defines a network to be composed, by 2010, of one third high-speed lines (around 16% of new high-speed lines and 21% of upgraded high-speed lines) and two thirds conventional lines.

The development of completed high-speed lines, new and upgraded,<sup>10</sup> continued to progress in the period described. The total length of high-speed sections in operation increased from 6 800 km in 1996 to 10 000 in 2001.

A dramatic growth in traffic volumes took place from 1991, when the total high-speed rail traffic in Europe amounted to 21.6 million passenger-km, to 2001, when the traffic was three times higher, reaching 65.4 million passenger-km. Traffic between 1998 and 2001 increased by 35% (48.5 to 65.4 million passenger-km).<sup>11</sup>

**Figure 6:** Development of the quality of TEN-T railway network until 2001 (% of km of tracks per type of link)

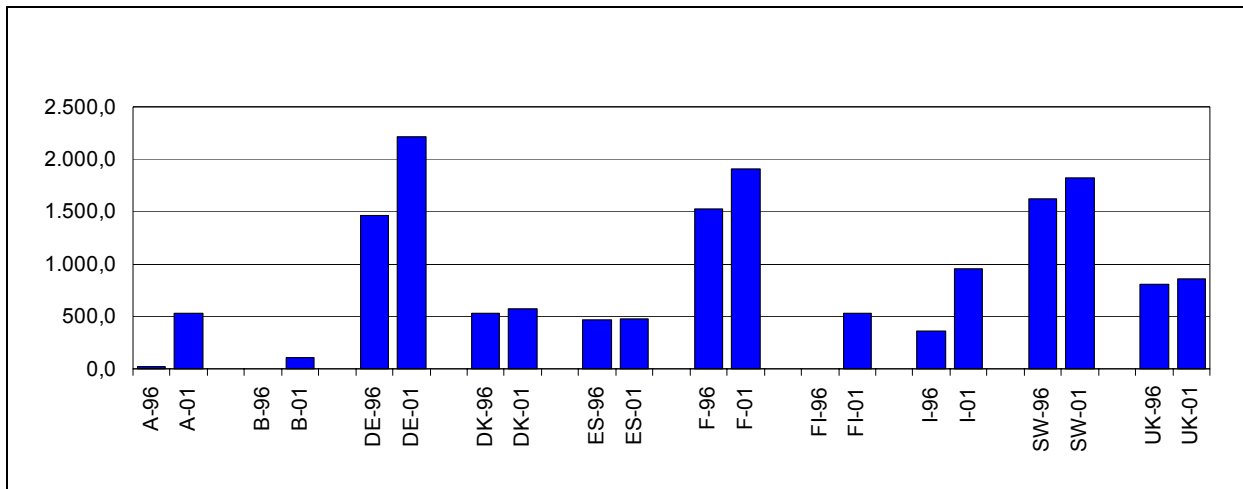


<sup>9</sup> Source: European Union Transport & Energy in figures, statistical pocketbook 2002, European Commission, Directorate-General for Energy and Transport in cooperation with Eurostat.

<sup>10</sup> As defined in Directive 96/48/EC, high-speed lines comprise:  
 - specially built high-speed lines equipped for speeds generally equal to or greater than 250 km/h,  
 - specially upgraded high-speed lines equipped for speeds of the order of 200 km/h,  
 - specially upgraded high-speed lines which have special features as a result of topographical, relief or town-planning constraints, on which the speed must be adapted to each case.

<sup>11</sup> Source: 'High speed trains in Europe' UIC- High Speed division, October 2002.

**Figure 7:** Development of the length of the TEN-T high-speed network (new and upgraded lines) until 2001 (in km per country)

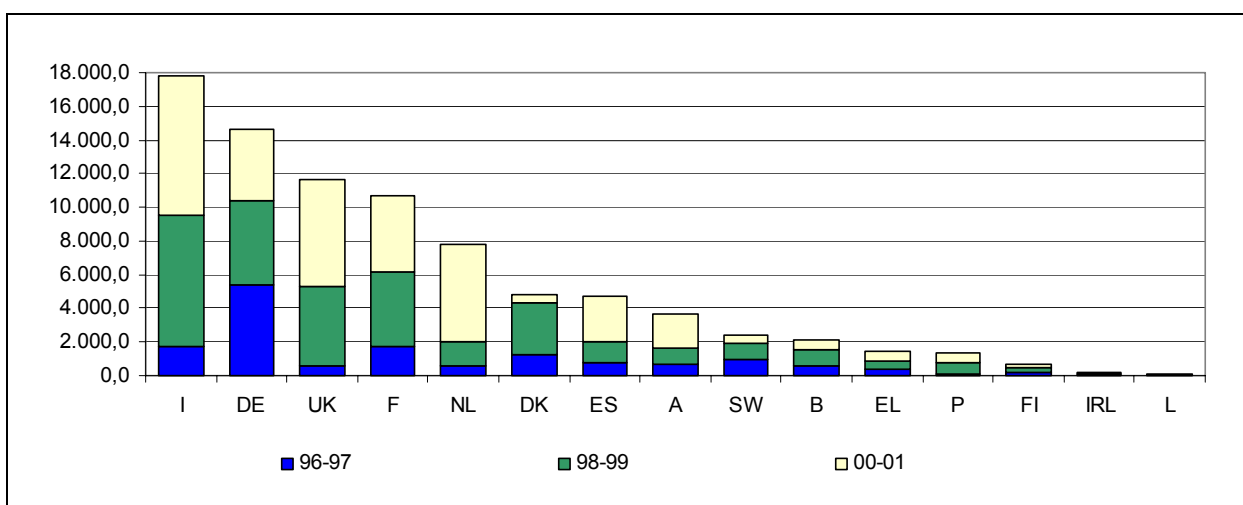


Investments in the TEN-T rail network totalled €69.1 billion during 1998-2001. This amount implies a significant increase in the funding effort allocated to the network if compared with the €15 billion invested in the EU in 1996-1997. Altogether, €84.1 billion was invested from 1996 to 2001.

In the period 1998-2001 Italy accounted for almost a quarter of the amount (23.3%), followed by the United Kingdom (16.1%), Germany and France (13.5% and 13.0% respectively). More than 45% of the total investment was devoted to new high-speed lines, while another 30% was allocated to upgraded high-speed lines.

The total cost of completing the TEN-T rail network as defined in the guidelines can be estimated at around €324 billion. This estimate has to be approached with caution, as uncertainties remain in projects still at an early stage of study, whose cost is to be calculated using unit costs (see annex on methodology and availability of data).

**Figure 8:** Investment in TEN-T railway network by country in 1996-2001 (in million €)



The following examples illustrate the progress achieved in 1998-2001:

- The 255 km of the TGV Méditerranée linking Valence to Marseille and Nîmes in France has been in service since 2001, offering journey times of 2 hours 55 minutes between Paris and Marseille.
- The Øresund bridge, a fixed rail/road link between Denmark and Sweden with a four-lane motorway running above a double-track railway (project number 11 of the Essen list of specific projects), went into service on schedule in July 2000. The new high-speed line between Hanover and Berlin was completed by 1998.
- Significant progress has been made on the construction of other lines to be operational in the near future, such as the new high-speed line Madrid-Barcelona- French border or the new link between Rome and Naples in Italy (204 km), which will cut travel times by around 50%.
- Concerning conventional lines, the progress achieved on the ‘Conventional rail link Cork-Dublin-Belfast-Larne-Stranraer’ (Priority project number 9), is also to be highlighted. After the completion in 1996 of the Cork-Dublin line, the Dublin-Belfast section was completed, thus reducing journey times to 1 hour 40 minutes. The reopening of the improved line from Belfast to Londonderry in June 2001 has cut the time of the direct service by over 40 minutes.

However, despite these success stories and the significant level of investment in the rail network, long delays in implementation can be identified in particular where major cross-border projects are concerned. Given the current rate of implementation, some of the major projects that appear in the 1996 TEN-T guidelines will not meet the 2010 deadline.

### 3.1.3. *Inland waterway network and inland ports*

Decision No 1346/2001/EC amending the guidelines adopted in 1996 as regards seaports, inland ports and intermodal terminals, as well as project No 8 in Annex III, was adopted by the European Parliament and the Council on 22 May 2001. The Decision includes a more focused definition of inland ports and projects of common interest related to them.

Around 15 000 km of EU waterways are accessible to 1000t vessels. The inland waterway network is composed of around 9 500 km of waterways ECMT class IV or above, defined in the guidelines as minimum technical characteristics for waterways forming part of the TEN-T network.

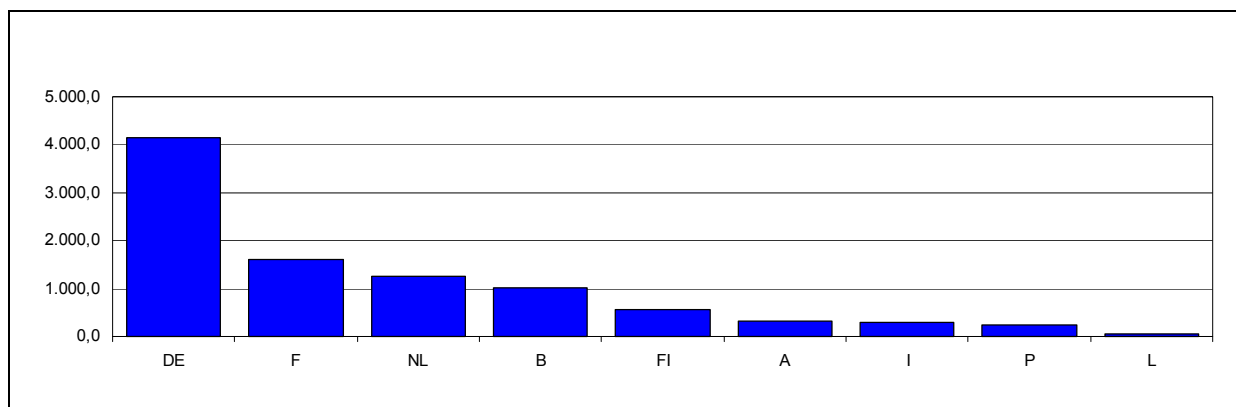
Despite the fact that only Austria, Belgium, France, Germany, Luxembourg and the Netherlands have major interlinked networks, inland waterways carried 125 billion tkm of freight traffic in 2000, representing 7% of intra-EU freight traffic.<sup>12</sup> The forthcoming enlargement of the Union will enhance the role of major inland waterway routes, mainly because of the accession of the Danube countries.

The TEN-T network also includes 210 inland ports. Inland ports and maritime inland ports form an essential part of the TEN-T, in particular as intermodal connection points with other transport modes. For this purpose adequate infrastructure inside the port area is required, together with links with other land modes and installations for the handling of containers and roll-on/roll-off traffic.

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<sup>12</sup> Source: European Union Transport & Energy in figures, statistical pocketbook 2002, European Commission, Directorate-General for Energy and Transport in cooperation with Eurostat.

**Figure 9:** Length of inland waterway network ECMT class IV or above by country (in km)



Investment in the TEN-T inland waterway network from 1996 to 2001 can be estimated at €3.2 billion.

The level of investment has been constant since 1996; in 1998-2001 it can be put at around €2 billion.<sup>13</sup> Germany alone accounted for 70% of this amount, with €1460 million reported, followed by Belgium (€320 million) and the Netherlands (€283 million). Finland and Austria reported smaller amounts. France did not report investments in the period 1998-2001.<sup>14</sup>

Accordingly, it is worth mentioning the progress in Germany, with works in the Magdeburg canal, the Hohenwarte lock or the Ditzmund-Erms canal; in Belgium, with the construction of the Sart bridge-canal or the Albert canal upgrading; and in the Netherlands, with works on the link Ketelmeer - Kampen and studies on the Juliana canal. These works have been supported by the TEN-T budget with a total amount granted of €54 million.

#### 3.1.4. Seaports

Seaports were also covered by Decision No 1346/2001/EC amending the guidelines adopted in 1996 as regards seaports, inland ports and intermodal terminals, as well as project No 8 in Annex III, adopted by the European Parliament and the Council on 22 May 2001. The new text defines three categories of ports included in the network: international seaports (category A), Community seaports (category B) and regional ports (category C), on the basis of quantitative criteria or their location in island, peripheral or outermost regions.

TEN-T projects of common interest involving seaports are identified by the criteria set out in Annex II of the guidelines and can be located in any port of a Member State. International seaports are shown on the maps in Annex I; 270 international seaports are included in category A. Seaports in the Union handle more than 40% of intra-EU freight traffic (1270 billion tkm in 2000).<sup>15</sup>

As in a majority of ports the services in the port are provided by private operators, global investments figures are only available in exceptional cases. The information available is

<sup>13</sup> Excluding investment in inland ports, reported on in next section.

<sup>14</sup> Data for Italy, Portugal and Luxemburg not available.

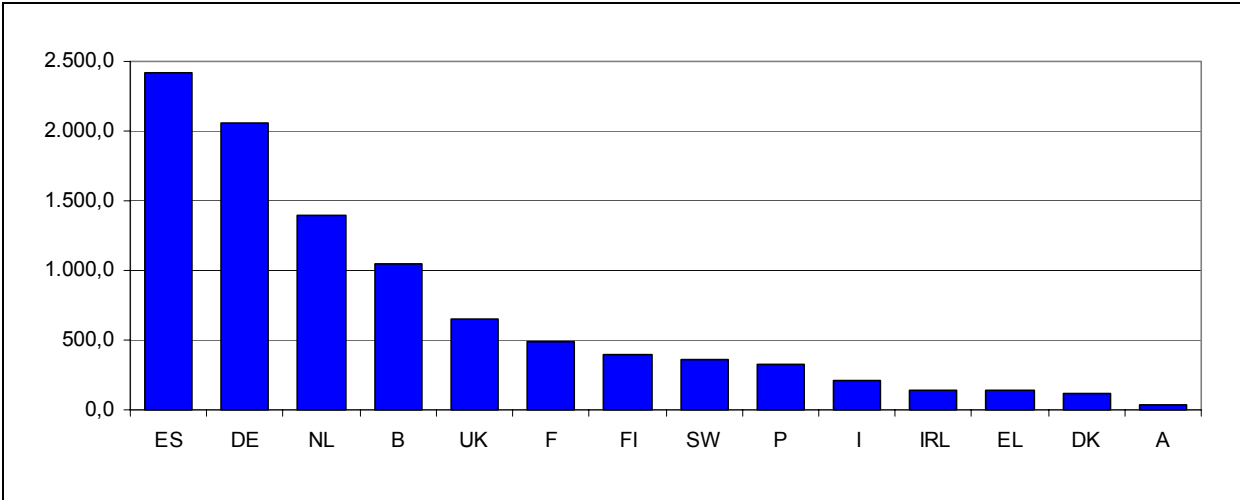
<sup>15</sup> Source: European Union Transport & Energy in figures, statistical pocketbook 2002, European Commission, Directorate-General for Energy and Transport in cooperation with Eurostat.

therefore partially incomplete and lacks homogeneity. It includes mainly data on international seaports.

Overall, investment in ports accounted for around €12.9 billion from 1996 to 2001, €9.8 billion of which was invested in the years 1998-2001. The level of investment remains stable over time.

Spain alone accounted for almost a quarter of the investment reported in the period 1998-2001 (24.8 %), followed by Germany (21.0%), the Netherlands (14.3%) and Belgium (10.7%).

**Figure 10:** Investment in TEN-T ports<sup>16</sup> in 1998-2001 by country (in million €)



Particular care has been taken to foster the improvement of connections with the TEN-T land networks, including logistic platforms associated with ports and the construction of new port infrastructure, thus advancing along the lines defined in the guidelines. Developments in several ports illustrate the progress in the period 1998-2001:

- Installation of a multimodal terminal in the port of Setubal (Portugal), improving the links between the ports and other modes and promoting port services and infrastructure in Leixões, Lisbon and Sines (Portugal).
- Preparation of works to improve access to the port and intermodal area in the port of Valencia (Spain) and extension of the port of Barcelona (Spain).
- Multimodal access to the port of Le Havre (Le Havre 2000).

3.1.5. Airports

The network of airports is very different from networks of surface links. Airports are by their nature intermodal nodes on a route network requiring virtually no en-route surface infrastructure.

The trans-European airport network, as defined in the guidelines, comprises some 330 airports. The 40 or so largest airports handle three quarters of all passengers and about 90 percent of extra-Community international traffic. They are thus regarded as International Connecting Points, although they also take most of the intra-Community traffic as well. A

<sup>16</sup> Including maritime, maritime-inland and inland ports.



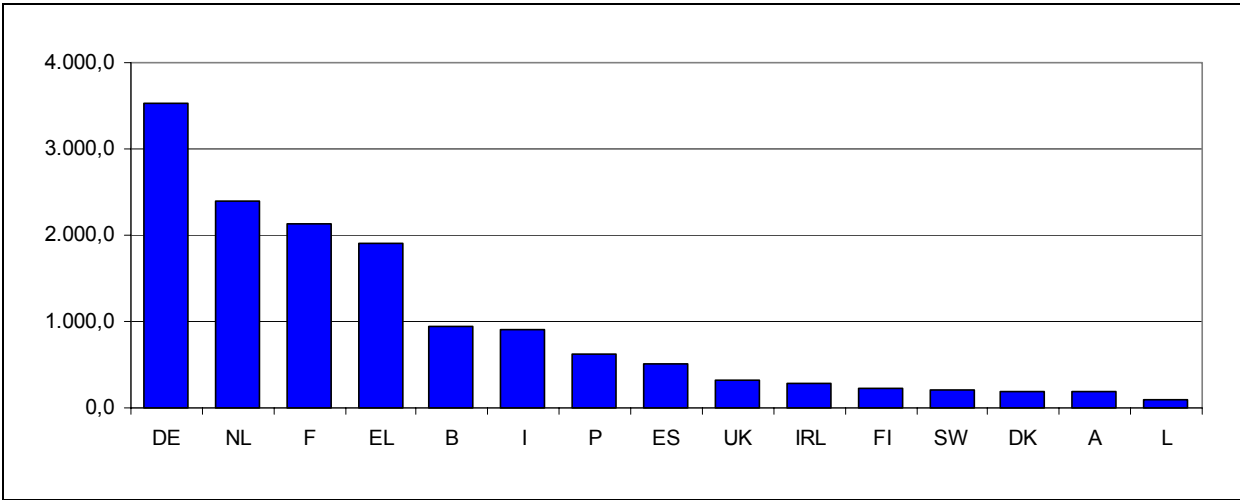
further 80 or so Community Connecting Points, generally handling between one and five million passengers per annum, account for almost all the remaining international and intra-Community traffic. The remaining 200 airports in the network tend to be quite small, but fulfil a vital Regional and Accessibility Point role, often in relatively remote areas, although they take only five per cent of Community passengers.

The objective of the guidelines is to ensure sustainable mobility of persons and goods in matching demand, while meeting safety and environmental requirements. The guidelines focus upon the optimization of the capacity and efficiency of existing infrastructure, intermodal connectivity, and the mitigation of environmental impact, as well as upon the provision of new infrastructure.

A total amount of €22.3 billion has been reported as invested in TEN-T airports in the Member States between 1996 and 2001.

Between 1998 and 2001, a total of the order of €14.5 billion has been identified as having been invested. More than three quarters of the total expenditure was related to International Connecting airports. Given the commercial status of most major airports, it is not surprising that the great bulk of investments came from private sources. Private management is also the reason behind some uncertainties in the investment figures, as investment data are not always centralised by national authorities.

**Figure 11:** Investment in TEN-T airports in 1998-2001 by country (in million €)



During the period 1998-2001, 47 airport projects received support from the TEN-T budget, for a total amount of €82 million. Half of the projects (23) concerned studies. Particular care has been taken to foster intermodality (in particular, and as a growing tendency, air/rail, which has received 37% of the support from the TEN-T budget) and protect the environment. Well planned and convenient intermodal feeder services to airports can help produce a sizeable fall in the use of individual transport modes, alleviate road congestion and help reduce pollution around airports. Eliminating bottlenecks has also been a priority, with projects geared to increasing capacity in existing airports and to building new airports (51% of the support from the TEN-T budget).

It is worth mentioning the support to Berlin Brandenburg International airport for studies for a total of €5 million. The largest grant, however, was for €11 million, in support of Milan Malpensa in 1999 (fifth and last year of interest rebate). Malpensa (Project number 10 of the Essen list of specific projects included in Annex III to the guidelines) was completed in 2001.

The financial plan for the airport, with a total investment from 1995 to 2001 of €945 million, comprised state grants, loans from the European Investment Bank and other financial institutions, and resources from the concessionaire for the Milan airport system. The Community has granted around €26 million from the TEN-T budget since 1995 in the form of interest rebates to support the project.

The new Athens International Airport - Eleftherios Venizelos - was opened for service in March 2001, after a total investment of €2219 million. The studies for Lisbon's new airport at Ota (Portugal), part of priority project number 8 'Multimodal link Portugal-Spain-Central Europe', continued to be developed. A total amount of €3.1 million was allocated to these studies from the TEN-T budget in the period 1998-2001. Developments have also to be mentioned at the Helsinki-Vantaa airport in Finland and at Stockholm-Arlanda Airport in Sweden.

### *3.1.6. Combined transport network*

It can be estimated that the number of TEU (twenty-foot equivalent units) moved by combined transport rose from 29 million to 37 million over the period 1996-1999. Over the same period the rail and inland waterway legs of combined transport operations were equivalent to 26.5% of road traffic over distances of more than 500 kilometres.<sup>17</sup>

Decision No 1346/2001/EC amending the guidelines adopted in 1996 as regards seaports, inland ports and intermodal terminals, as well as project No 8 in Annex III, was adopted by the European Parliament and the Council on 22 May 2001. The text included, in the TEN-T combined transport network, intermodal terminals equipped with installations permitting transshipment between railways, inland waterways, shipping routes and roads.

Progress reported in other modes often includes expansion or upgrading works which contribute to the development of combined transport. This is also the case for 7 of the 14 specific projects, notably the Betuwe rail freight line in the Netherlands - for which 7€1 million was allocated from the TEN-T budget in the period 1998-2001. Other small contributions from the TEN-T budget, around €10 million, were also allocated in the period 1998-2001 to studies on specific terminal schemes, such as the logistic platform Salvatierra-As Neves in Vigo (Spain), the feasibility study of track options and alignment on single track combined railway line between Umeå and Nyland (Sweden) and a study on multimodal terminals in Portugal.

## **3.2. Traffic management and navigation systems**

The TEN-T guidelines include the telematics infrastructure for traffic management systems and traffic information services. The aim is to ensure interoperability and the continuity of services across borders.

The Action Programme for Road Transport Telematics endorsed by the Council of Ministers in 1997 was developed by the European Commission with the help of a group of high-level representatives from all Member States. These proposals - which deal with research and development, technical harmonisation, concentration and co-ordination, financing and legislation - identified five priority areas: RDS-TMC-based information services, electronic

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<sup>17</sup> Estimates in the Commission Report on the application during the years 1996 to 1999 of Council Directive 92/106/EEC of 7 December 1992 on the establishment of common rules for certain types of combined transport of goods between Member States. COM (2002)215.

fee collection, traffic data exchange/information management, HMI (human/machine interface) and system architecture. Other priority applications related to pre-trip and on-trip information and guidance, inter-urban and urban traffic management, operation and control; collective transport; advanced vehicle safety/control systems and commercial vehicle operations.

The White Paper on Transport Policy published in 2001 also announced that a directive on the interoperability of tolling systems would be proposed by the Commission in order to support the overall pricing policy to be developed between 2001 and 2010. This directive is of paramount importance to the interoperability and continuity of service of the Trans-European Road Network, (TERN).

### *3.2.1. Intelligent Transport Systems (ITS) in the TEN-T*

Between 1998 and 2001, the EU continued working with the Member States on improving the coherence and management of the national work programmes (total ITS investment costs on the TERN amount to €500-600 million a year), by using European deployment projects supported financially by the TEN-T budget line. Methods of disseminating the information to travellers in the form of pre-trip and on-trip traffic information have been developed. Although action has been taken in most of the Member States to deliver cross-border services, this is not yet achieved.

From 1995 to 2000, DG TREN promoted the development of ITS on the trans-European road network by contributing over €125 million to the funding of road traffic management projects. In 2001, this annual programme of TEN-T funding was replaced by the European Commission's Multi-Annual Indicative Programme (MIP). Six ITS projects backed by €192 million of EU support until 2001 were selected: ARTS, CENTRICO, CORVETTE, SERTI, STREETWISE and VIKING.

The projects aim to reduce congestion and provide seamless information to travellers on the TERN. A clear focus is placed on faster deployment of systems and services for the traveller and the treatment of cross-border problems through the cooperation of different member states in the projects. At the end of 2001, the six euro-regional projects had led to the implementation of systems on the TERN such as traffic and weather monitoring, data exchange, the deployment of traffic control and information applications (e.g. variable message signs).

### *3.2.2. European Rail Traffic Management System ERTMS*

ERTMS is an umbrella programme that brings together three main streams of development activity in the areas of signalling and command/control (ERTMS/ETCS), telecommunications (GSM-R) and traffic management (ERTMS/ETML). Such applications should be geared to the management of passenger and freight logistics across the value-chain of rail transport, and help to create a sound foundation on which to build intermodal door-to-door value-added services. Such an approach should lead to a significantly higher return on investments, which are primarily safety-related, whilst optimising through-transportation services and the efficiency of rail operations.

### *3.2.3. Air Traffic Management (ATM)*

The TEN-T guidelines in the area of ATM are designed to facilitate and accelerate implementing measures to increase the capacity and safety of the European ATM system and

to ensure optimum use of available Air Traffic Control resources. Given the intricate nature of a system composed of different national systems and the wide range of actions necessary, Community support has focused on two main streams of activities: upgrading the current system; and facilitating the development of the future European system.

The Community role in ATM developed considerably during the period, with the development and tabling of the legislative package on the Single European Sky. The TEN-T programme provides an important financial instrument to support the achievement of Single European Sky objectives through the implementation of an efficient trans-European network, encompassing ATM national systems and in particular promoting interoperability, interconnection and technical advances.

The situation of under-capacity of the network and its fragmentation necessitates:

- removing and/or relieving major bottlenecks in the network where and when capacity shortages materialise; this approach of reactive, local and near-term support is reflected by the implementation of national projects aiming to upgrade existing facilities, primarily through the ‘Annual’ exercise;
- developing and implementing the new generation of components in the network to deliver uniform and significant capacity increases; this approach of a proactive, regional and long-term nature is represented by the implementation of pre-operational projects or studies coupled with the provision of facilities on a regional basis, primarily through the Multi-annual Indicative Programme.

From operational and technical viewpoints, significant improvements were ensured through the pre-implementation of enhanced surveillance, controller tools and system upgrade (Annual exercise) and Automatic Dependence Surveillance systems (ADS-B and datalink), the next generation flight data processing system and system validation platforms (Multi-annual Indicative Programme).

#### 3.2.4. *Global Navigation Satellite System (GNSS)*

##### EGNOS

The development of EGNOS is based on a tripartite agreement between the European Community, represented by the European Commission, the European Space Agency and Eurocontrol.

Under this agreement, approved by the Council of the European Union on 18 June 1998, EGNOS is the first phase (GNSS 1) of the European Union's policy on a global navigation satellite system or GNSS. The second phase (GNSS 2) is the Galileo programme and the actual launch of a new constellation of radio navigation satellites.

EGNOS is one of the projects selected for the trans-European networks (TENs). In this framework, it receives European Community funding of € 116.4 million, the equivalent of about one third of the total cost. In addition to financial contributions from the European Community and the European Space Agency, public administrations and corporate members of the EOIG from the civil aviation sector have provided some €100 million for the development of EGNOS.

## Galileo

The "Galileo" satellite navigation project emerged in 1999 as the most important pan-European TEN initiative.

Cost-benefit analyses carried out for the Commission estimate that Europe's share of the global market for satellite navigation products and services may be worth as much as €9 000 million each year from 2015 onwards as a result of using Galileo, and that up to 140 000 new jobs could be created.

The project continued its definition phase during 2000. The costs of this phase, and of development and validation (about 1€.1 billion), will be provided entirely by public funds (Community budget and European Space Agency).

### **3.3. Horizontal issues**

#### *3.3.1. Interoperability*

One of the main objectives of the TEN-T is the interoperability of national networks. The wide range of activities on interoperability that are under way have been described in previous sections.

Interoperability of the rail networks is one of the key levers of a policy to integrate the national conventional and high speed rail systems so as to make international services more competitive.

Greater interoperability, i.e. the capacity for trains to cross national frontiers without stopping or the ironing-out of technical differences generating excessive costs, produces a significant increase in transport performance.

In the case of high-speed rail transport, the Community implemented this objective in 1996 by adopting a Directive<sup>18</sup> on the interoperability of the high-speed system.

As for the interoperability of the trans-European conventional rail system a Directive<sup>19</sup> was adopted in March 2001. The essential purpose of the regulation was to extend the mechanisms created for the high-speed network to the conventional rail network, with a few modifications.

These Directives introduced Community mechanisms for producing and adopting technical specifications for interoperability, along with common rules for assessing compliance with those specifications. As was the case with the high-speed Directive, Directive 2001/16 is the foundation of a three-level structure: the Directive itself, with the essential requirements to be met by the system; the Technical Specifications for Interoperability (TSI); and all the other European specifications, especially the European standards of the European standardisation bodies CEN, Cenelec and ETSI.

Regarding the interoperability of the high-speed rail system, 2001 saw the production of the initial version of the TSI. In December 2001 the Commission presented the regulatory committee with six proposals for decisions relating to the high-speed TSI. They received a

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<sup>18</sup> Directive 96/48/EC of 23 July 1996

<sup>19</sup> Directive 2001/16/EC of the European Parliament and of the Council was adopted on 19 March 2001 (OJ L 110, 20. 4.2001, p. 1)

unanimous favourable opinion. These proposals for decisions related to the "control/command and signalling", "energy", "infrastructure", "maintenance", "operation" and "rolling stock" subsystems.

The mandate to the AEIF (European Association for Railway Interoperability) to produce the first group of priority TSI for conventional rail elicited a favourable opinion from the regulatory committee in June 2001. These TSI concern the following: control/command and signalling; telematic applications for freight services; traffic operation and management (including staff qualifications for cross-border services); freight wagons; noise problems deriving from rolling stock and infrastructure. In addition, work began on producing an architecture representative of the conventional network.

### *3.3.2. Research and development*

Research and development is one of the broad lines of measures covered by the TEN-T guidelines. Under the Fourth Framework Programme of the European Community for research, technological development and demonstration (1994-1998), several specific programmes included activities contributing to the development and implementation of the TEN policy, namely the Transport research programme, the Non-nuclear energy programme and the Information and communications technologies programme.. Under the Fifth Framework Programme for research, technological development and demonstration (1998-2002), several key actions of individual, specific programmes, such as sustainable mobility and intermodality, land transport and marine technologies, efficient energy systems, and services for the citizen were initiated.

In particular, the transport research programme contributed to EU policy on the trans-European transport network by providing support for the planning and financing of the investment programme and the development of new infrastructure and services. Evaluation methodologies and software tools have been provided to help policy-makers assess the impacts of different infrastructure plans. New solutions for the efficient operation of networks and terminals have also been assessed.

The main research lines, developed in around 50 different research projects, can be described as follows:

- Interoperable European networks: Identifying organisational strategies to improve interoperability, and developing innovative technologies for freight terminals and combined transport.
- Managing traffic and navigation: Assessing speed management systems for road transport, developing European systems for traffic management in air, rail and waterborne transport, and assessing the potential for Galileo.
- Evaluating trans-European networks: Assessing regional and economic impacts and barriers to implementation, and developing strategic tools and methods for forecasting traffic and environmental impacts.
- Interconnecting multi-modal networks: Identifying new solutions for freight terminal operations, seaport-hinterland connection and pre- and end-haulage.

- Developing trans-European networks: Assessing the potential of dedicated freight railway networks and inland waterways, providing guidelines on the implementation of public private partnerships, and assessing alternative developments for pan-European corridors.

After a development phase supported by the research programmes, systems like the European global navigation satellite system (GALILEO) and the European rail traffic management system (ERTMS) will be further developed, validated and deployed with financial support from the TEN budget.

### 3.3.3. *Environmental protection*

Integrating the environment and sustainable development into transport policy, as set out in the Council Strategy of 6 October 1999, has become a core element in EU transport policy, as outlined in the White Paper on a Common Transport Policy<sup>20</sup> and in the 6th Environment Action Programme<sup>21</sup> for the forthcoming decade. Among all sustainability concerns, both the White Paper and the Sustainable Development Strategy attached great importance to Climate Change and to the need to attain the objectives of the 1997 Kyoto Protocol on the reduction of greenhouse gases.<sup>22</sup> Transport accounts for 20% of the Union's emissions of greenhouse gases and 29% of CO<sub>2</sub> emissions.

The White Paper pointed out that in the EU “some 7500 km, i.e. 10% of the TEN road network, is affected daily by traffic jams”. The Paper also foresaw an annual growth rate in the EU of 1.8% for passenger transport and 2.8% for freight transport, leading to an overall increase of 24% in passenger transport and 38% in freight traffic between 1998 and 2010.

In June 1998, the Cardiff European Council invited the Transport, Energy and Agriculture Councils to develop strategies to promote environmental integration and sustainable development within their respective policy areas. In response to this request, the Transport Council developed such a strategy for the transport sector and this was approved at its meeting of October 1999. In April 2001, the Council adopted a Resolution on the integration strategy in which it reaffirmed its earlier integration strategy and asked the Commission to engage in further action.

As a result, insofar as TEN-T projects are concerned, the standard application form was amended in December 1999 to include a specific declaration by the authority responsible for monitoring Natura 2000 sites, within the Annex on conformity with environmental legislation. This amendment was designed to facilitate internal procedures within Member States, thus ensuring the conformity of TEN-T projects with Natura 2000 and in particular with the site protection requirements of Article 6 of the Habitats Directive. The annex on conformity with environmental legislation also covers environmental impact assessment (Directive 85/337/EEC as amended by Directive 97/11/EC).

Legal Provisions on strategic environmental assessment were established in the Community by the Directive<sup>23</sup> on the assessment of the effects of certain plans and programmes on the environment (SEA Directive). The Member States of the European Union are required to

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<sup>20</sup> COM(2001)370

<sup>21</sup> COM(2001)31

<sup>22</sup> The Kyoto Protocol obliges the Union to reduce its emissions of GHG by 8% for the period 2008-2012 with respect to 1990. It has already been ratified by the Union but has not yet entered in force.

<sup>23</sup> Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 (Official Journal L 197, p.30).

transpose this Directive into national law by July 2004. The Directive applies to certain transport plans and programmes, including those relating to the trans-European networks, and will require Member States to identify, describe and evaluate the environmental effects of implementing those plans.

The Sustainable Development Strategy (SDS) adopted by the European Council in Gothenburg in June 2001 is based on the principle that the economic, social and environmental effects of all policies should be examined in a coordinated way and taken into account in decision making. The SDS puts a particular emphasis on sustainability in transport policy, and underlines the need to take action in order to bring about a significant decoupling of transport growth and GDP growth. In addition, the SDS requested that all new major policies proposed be subject to a sustainability impact assessment including an assessment of their potential economic, environmental and social benefits. Subsequently the Commission issued a Communication on Impact Assessment (COM(2002)276) setting out the requirements to undertake a proportionate assessment of the positive and negative economic, social and environmental impacts associated with action or lack of action, both inside and outside the EU.

#### **4. COMMUNITY FUNDING**

This section provides an overview of the financing of TEN-T and in particular EU financial support during the period under consideration.

In most cases Community financing of TENs accounts for a rather limited proportion of the total cost, except for projects in the "cohesion" countries. The role of Community finance is to act as a catalyst to lever other investment sources. The greater part of the funding comes either from the public authorities of the Member States or, especially in the case of airports and ports, from the private sector.

The total amount of funds committed during the period 1998-2001 from the TEN-T budget and the Cohesion Fund is put at €7.58 billion in the form of direct grants (average of €1.9 billion per year). Commitments from the European Regional Development Fund (ERDF) during the period can be estimated at an additional total amount around €3 billion.<sup>24</sup>

Financial commitments from the TEN-T budget in the period 1998-2001 amounted to €2.11 billion. Slightly over 50% of this amount was allocated to the 14 specific projects listed in Annex III of the guidelines. In the same period, the Cohesion fund committed €5.47 billion.

The European Regional Development Fund (ERDF) and the Cohesion Fund are the main sources of Community support for TEN projects. When it comes to Structural Funds, allocations by broad area of assistance under Objective 1 show that support for infrastructure was slightly below 30% in the last programming period (1994-1999); it totals about one third

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<sup>24</sup> Expenditure through the Regional Development Fund is not broken down by financed TEN project - ERDF financing of TEN infrastructure is usually part of larger transport programmes and national authorities do not always identify what exactly corresponds to TEN. Detailed and accurate figures for ERDF spending on TEN projects are therefore not available at present. Examination of the annual reports on implementation of the main programmes financing infrastructure in the context of Objective 1 can provide no more than an estimate. This is an indication of the need for better coordination of the different Community policy approaches and sources of funding.



of available resources over the period 2000-2006. About half the infrastructure grants will be devoted to transport networks, and highly concentrated in the cohesion countries.

In addition, the European Investment Bank (EIB) provided loans of €19.56 billion and the European Investment Fund (EIF) guaranteed loans for a value of €0.46 billion.

It has to be noted that after the reform of the European Investment Fund (EIF) in 2000 its TEN activity, which had been complementary to that of the EIB, was transferred to the EIB. The Bank assumes the advantages of the transferred portfolio, but will also bear the ultimate risk of the transactions, the EIF remaining merely a guarantor of record.

Overall, the combined total of monies from European sources in the period 1998-2001 amounts over €30 billion. This represents a share of 23% of the total investment in TEN-T projects over the period.

**Table 1:** Community funding of TEN-T projects in 1998-2001 (in million €)

	TEN-T Budget	Cohesion fund	EIF (loans/ guarantees)	EIB loans (loans)
1998	474	1337	72	4415
1999	497	1523	266	5977
2000	580	1287	117	4010
2001	563	1318	-	5161
Total 1998-2001	2114	5465	455	19563

As regards EU funding by transport mode (see Table 2 below), two thirds of the Union support via the TEN-T budget was allocated to rail projects (62.4%). Road projects received 13.5% and traffic management projects 14.5%. This last amount includes the grants allocated to the development of Galileo.

The share of rail in the Cohesion fund grants continued to increase: it rose from 18.5% in 1996 to 32.5% in 1997 and 45.8% in 1998, showing progressive alignment with the sustainable development priorities set for the EU. The average allocation to rail projects during the period was 60.8%, while road projects accounted for 29.2% of the funding.

**Table 2:** Modal share of Community financial support in 1998-2001: TEN-T budget  
(in million € and %)

	1998		1999		2000		2001		Total	
	M ECU	%	M EUR	%	M EUR	%	M EUR	%	M EUR	%
Road	59	12.4%	86	17.3%	71	12.3%	68	12.1%	284	13.5%
Rail <sup>25</sup>	315	66.5%	318	64.0%	381	65.7%	304	54.0%	1318	62.4%
Inland waterways	9	1.9%	18	3.6%	16	2.7%	11	1.9%	54	2.5%
Seaports	10	2.1%	3	0.6%	3	0.4%	11	1.9%	26	1.2%
Airports	28	5.9%	29	5.8%	11	1.9%	14	2.4%	82	3.9%
ITS <sup>26</sup>	53	11.2%	43	8.7%	59	10.1%	152	27.0%	307	14.5%
Combined and multimodal transport	-	-	-	-	39	6.7%	4	0.7%	43	2.0%
Total	474	100.0%	497	100.0%	580	100.0%	563	100.0%	2114	100.0%

**Table 3:** Modal share of Community financial support in 1998-2001: Cohesion fund  
(in million € and %)

	1998		1999		2000		2001		Total	
	M ECU	%	M EUR	%	M EUR	%	M EUR	%	M EUR	%
Road	570	42.6%	345	22.7%	309	24.0%	371	28.2%	1596	29.2%
Rail	613	45.8%	959	62.9%	965	75.0%	783	59.5%	3321	60.8%
Ports	10	0.8%	46	3.0%	13	1.0%	163	12.4%	232	4.2%
Airports	139	10.4%	145	9.5%	0	0.0%	0	0.0%	284	5.2%
ITS	5	0.3%	29	1.9%	0	0.0%	0	0.0%	34	0.6%
Total	1337	100.0%	1524	100.0%	1287	100.0%	1317	100.0%	5467	100.0%

<sup>25</sup> Includes rail traffic management systems

<sup>26</sup> All modes except rail

**Table 4:** Breakdown of TEN-T budget by type of project (in million € and %)

	1998	1999	2000	2001	Total	Total %
Specific projects	305	288	288	248	1128	53.4%
Traffic management except rail	53	45	58	156	312	14.7%
Other projects of common interest	116	164	235	160	675	31.9%
Total	474	497	581	563	2115	100.0%

## 5. DEVELOPMENT OF SPECIFIC PROJECTS

The trans-European transport network is an ambitious programme for the construction, modernisation and interconnection of Europe's major transport infrastructures. The Commission has concentrated more than half (53%) of the TEN-T available financial resources in the period 1998- 2001 on the 14 specific "Essen" projects (including rail traffic management).

Three of the specific projects have been completed:

Conventional rail link Cork-Dublin-Belfast-Larne-Stranraer, Malpensa Airport, and the Øresund Fixed road/rail Link.

Steady progress was made on all of the remaining 11 "specific projects" from the 14 identified by the Essen European Council, these being:

High-speed train/combined transport north-south (completion date around 2012); high-speed train PBKAL (completion date around 2007); high-speed train south (completion date around 2010); high-speed train east (completion date around 2010); conventional rail/combined transport: Betuwe line (completion date around 2006); high-speed train/combined transport France-Italy (completion date around 2010); Greek motorways Pathe and Via Egnatia (completion date around 2008); multimodal link Portugal-Spain-Central Europe (completion date open); Nordic triangle (rail/road) (completion date around 2010); Ireland/United Kingdom/Benelux road link (completion date around 2012); west coast main line (rail) (completion date around 2007).

The projects will make an important contribution to improving links between the centre of the European Union and its periphery and will streamline journeys along Europe's major transport routes and regions by upgrading road, rail and maritime infrastructures and by relieving current traffic bottlenecks. Some will link Europe's major economic centres with the acceding countries of central and eastern Europe and facilitate access to future neighbouring countries.

Most of the projects focus on the development of Europe's railway network. Improved speed and convenience are expected to attract new users to these international routes, helping to shift traffic from the roads. The TEN-T projects will allow dramatic improvements, significantly reducing journey times and increasing safety, especially for international traffic.

By expanding rail transport capacity it will increase rail's share of intra-Community freight transport along European corridors and contribute to environmental sustainability. Directly and indirectly, the projects will also stimulate job creation in the regions affected.

Three out of the fourteen specific projects have been completed and five are expected to be completed by 2007. The main causes for these delays have been the increasing complexity of infrastructure project management, lack of firm planning, changes in project specifications, challenges in local courts and lack of funding due to both changes in national governments priorities and poor attractiveness for private investors.

Several of the priority projects have also suffered from cost overruns (around 20% on average, see annexes 2 to 4), even if corrected for inflation. Such deviations are indeed common in large-scale transport infrastructure projects and stem from redesign of the project, price revisions, higher land acquisition or environmental protection and safety requirements costs, and delays.

On 2 October 2001 the Commission proposed a revision of Decision 1692/96/EC on Community guidelines for the development of the trans-European transport network. The proposal<sup>27</sup> concentrates investment on a few horizontal priorities and a limited number of specific projects, updating the list adopted by the Essen and Dublin European Councils as follows:

Galileo global navigation and positioning satellite system (completion date around 2007); high-capacity rail link across the Pyrenees (completion date around 2020); Stuttgart–Munich–Salzburg/Linz–Vienna high-speed train/combined transport project for Eastern Europe (completion date around 2012); Danube river improvement between Vilshofen and Straubing (completion date open); high-speed rail interoperability on the Iberian peninsula (completion date open); Fehmarn Belt fixed link between Germany and Denmark (completion date around 2013); extension of high-speed train/combined transport north–south (completion date around 2007); and extension of the high-speed train south (completion date around 2012).

Detailed information about all priority projects is given in annexes 2 to 4.

## **6. GENERAL ASSESSMENT<sup>28</sup>**

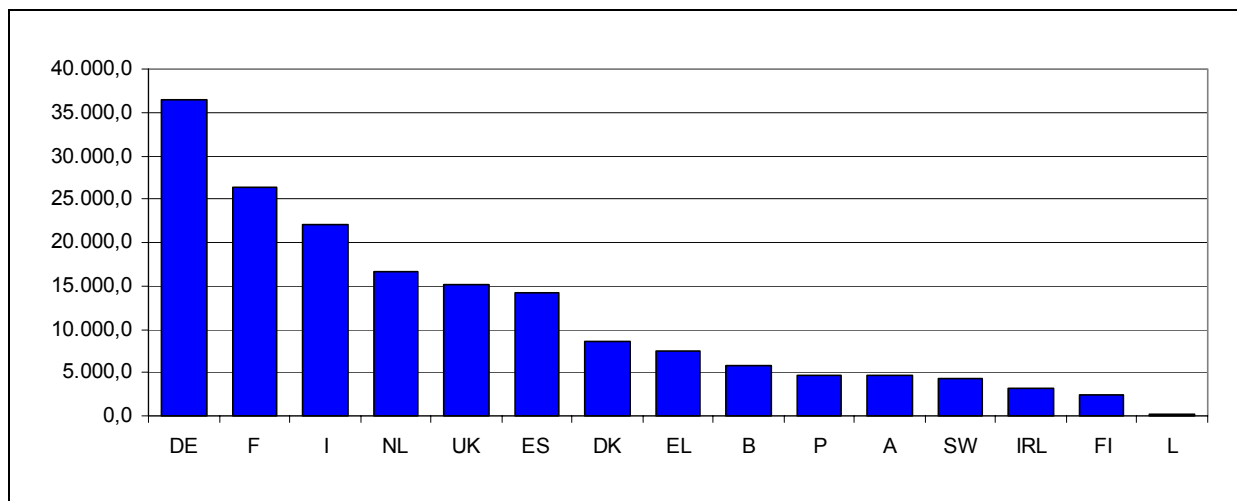
The total investment in the TEN-T network from 1996 until 2001 can be put at slightly over €170 billion. Its distribution per country is shown in figure 1. Figure 2 represents the total investments per country compared with GDP.

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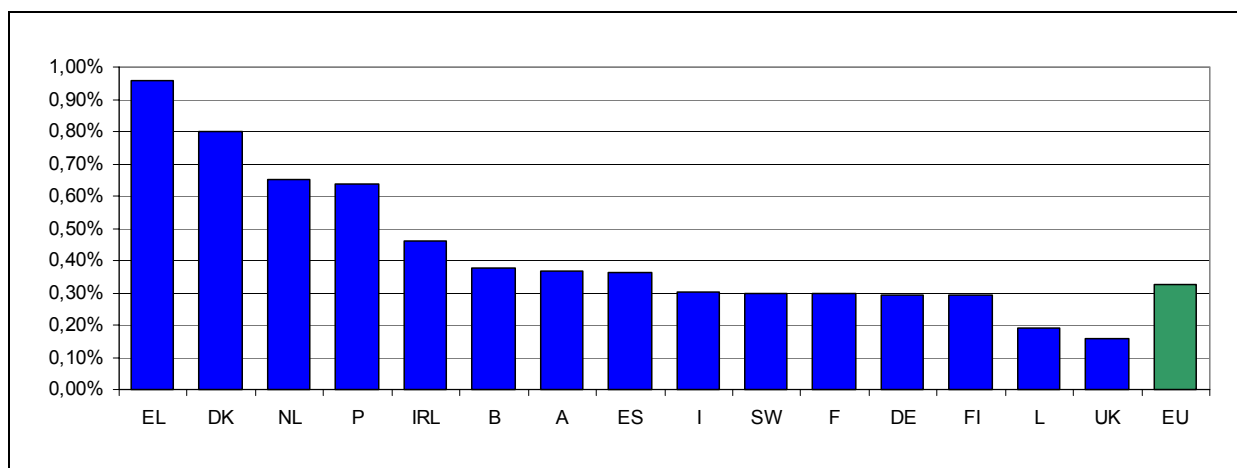
<sup>27</sup> Proposal for a decision of the European Parliament and of the Council amending Decision No 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the trans-European transport network. COM (2001) 0544 (*Official Journal C 362 E, 18/12/2001 P. 0205 – 0250*).

<sup>28</sup> See notes on methodology and availability of data.

**Figure 12:** Investment in TEN-T network by country in 1996-2001 (in million €)



**Figure 13:** Investment in TEN-T network by country in 1996-2001 (average investment per year/GDP in 2001 in %)



The global investment in the TEN-T during the period 1998-2001 is estimated to be about €129.3 billion. The investment was almost uniform in 1998-1999 (€65.7 billion) and in 2000-2001 (€63.7 billion).

These amounts are significantly higher than the total investment of €37.4 billion reported for 1996-1997 in the previous TEN-T implementation report, even if this last figure might be underestimated. Current data, with more perspective and completeness, especially as far as ports and airports are concerned, indicate that around €42 billion was invested in 1996-97.

Table 5 shows the amounts invested in 1998-2001 per country and per mode of transport.

**Table 5:** Investments in 1998-2001 per mode and country (in million €)

	<b>Road</b>	<b>Rail</b>	<b>IWW</b>	<b>Ports<sup>29</sup></b>	<b>Airports</b>	<b>Total</b>
A	638.7	2972.9	3.3	29.9	181.8	3826.6
B	554.5	1506.5	320.2	1044.3	939.5	4365.0
DE	7566.6	9303.2	1460.4	2053.5	3521.8	23905.5
DK	2049.6	3475.6	-	121.7	192.9	5839.8
EL	2222.9	1043.9	-	134.3	1904.1	5305.2
ES	3888.7	3997.8	-	2422.7	508.8	10818.0
F	8373.2	9001.5	0.0	486.4	2138.7	19999.8
FI	468.5	501.0	16.4	397.0	228.9	1611.8
I	1015.2	16114.4	-	204.1	914.9	18248.6
IRL	1886.4	137.0	-	136.0	286.1	2445.5
L	62.1	17.9	-	-	89.3	169.3
NL	1550.3	7153.6	282.9	1395.3	2392.6	12774.7
P	1376.4	1249.4	-	330.7	629.4	3585.9
SW	624.9	1472.4	-	356.0	200.5	2653.8
UK	1697.3	11121.1	-	647.1	327.1	13792.6
<b>Total</b>	<b>33975.3</b>	<b>69068.2</b>	<b>2083.2</b>	<b>9759.0</b>	<b>14456.4</b>	<b>129342.1</b>

In terms of modal share, Figure 14 indicates that investment over the period 1998-2001 focused on rail, which alone accounted for more than half of the total investment, and was double the amounts invested on roads (26.3%). Airports accounted for 11.2% and ports and inland waterways for 9.1%.

These figures show a clear increase compared with the period 1996-1997, when rail investments accounted for 35.6% of total investment, below roads investment (37.2%). A closer analysis indicates, however, that the absolute volumes of investment on roads have been maintained: the change of share is due to the increase in total amounts invested, which has been absorbed mainly by rail projects.

Investments on the other modes have not changed significantly.

<sup>29</sup> Figures on ports include maritime, maritime-inland and inland ports.

It has to be noted that this modal breakdown of investment cannot be generalised to the global investment on all kinds of transport infrastructure (TEN and not TEN) in the EU. The latest figures available indicate that, in 1995, 63.9% of the total investment in transport infrastructure in the EU was allocated to road, and only 28.9 % to rail.<sup>30</sup> Also, the percentage of total length of track included in the TEN-T railways network is significantly higher than the percentage of km of roads: half the length of track in the EU is included in the TEN-T, against less than a quarter of the total length of main roads labelled as TEN-T roads, obviously without taking regional and local roads into account.

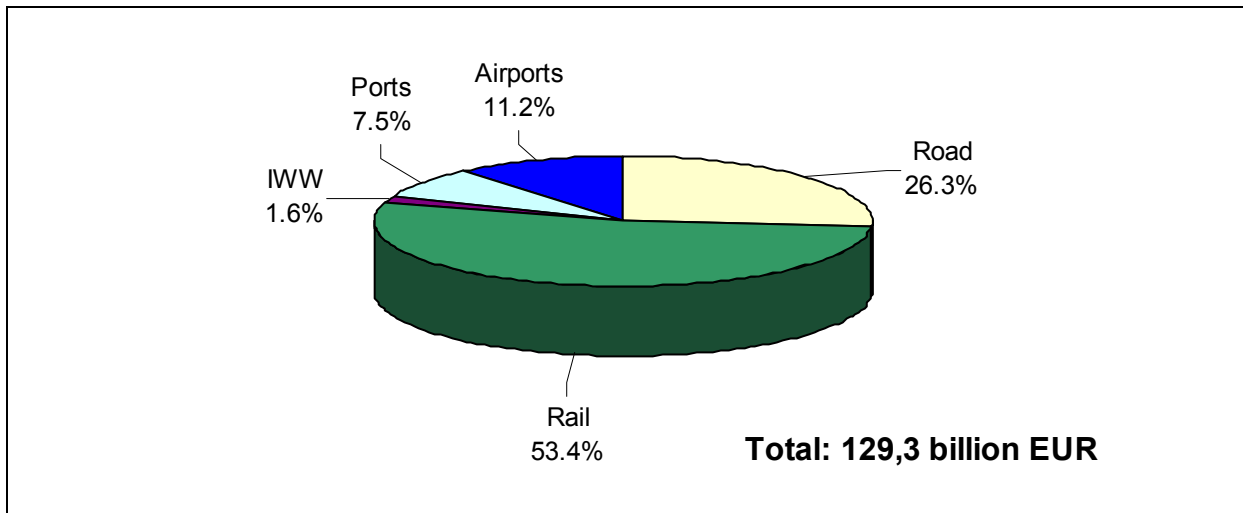
**Table 6:** Modal share per country of investments in 1998-2001 (in %)

	<b>Road</b>	<b>Rail</b>	<b>IWW</b>	<b>Ports</b>	<b>Airports</b>
A	16.7%	77.7%	0.1%	0.8%	4.8%
B	12.7%	34.5%	7.3%	23.9%	21.5%
DE	31.7%	38.9%	6.1%	8.6%	14.7%
DK	35.1%	59.5%	-	2.1%	3.3%
EL	41.9%	19.7%	-	2.5%	35.9%
ES	35.9%	37.0%	-	22.4%	4.7%
F	41.9%	45.0%	0.0%	2.4%	10.7%
FI	29.1%	31.1%	1.0%	24.6%	14.2%
I	5.6%	88.3%	-	1.1%	5.0%
IRL	77.1%	5.6%	-	5.6%	11.7%
L	36.7%	10.6%	-	-	52.7%
NL	12.1%	56.0%	2.2%	10.9%	18.7%
P	38.4%	34.8%	-	9.2%	17.6%
SW	23.5%	55.5%	-	13.4%	7.6%
UK	12.3%	80.6%	-	4.7%	2.4%
<b>Total</b>	<b>26.3%</b>	<b>53.4%</b>	<b>1.6%</b>	<b>7.5%</b>	<b>11.2%</b>

<sup>30</sup>

Source: ECMT.

**Figure 14:** Share of total investment in the TEN-T per transport mode in 1998-2001



To give an idea of the general advancement in the completion of the TEN-T, investment needs to be compared with the global targets defined in the guidelines. With the information currently available, the total cost of implementing the TEN-T can be estimated to be at around €550 billion, at 1999 prices.<sup>31</sup> This estimate has to be treated with caution, however. Specific modal estimates are included in section 3.1 Modal networks.

Taking into account the progress already achieved and the investments already made on the network (a global amount around €170 billion), it can be concluded that progress in achieving the objectives set out in the guidelines is not fully satisfactory. At the current rate of investment, a rough estimate indicates quite clearly that the global targets – with related remaining investment estimated at around €380 billion - would not be achieved by 2010.

In addition, progress is far from uniform. For road, less than 4% of the length of planned links will still not be completed by 2010, and, for rail, up to 50% of the length of planned links will remain uncompleted. Despite a significant level of investment in the rail network through Member State financing, often combined with European funds, long delays in implementation have been identified in particular where major cross-border projects are concerned. Unequal project development between Member States concerned by cross-border projects is often an additional difficulty.

Given the current rate of implementation, some of the major projects which appear in the 1996 TEN-T guidelines would not meet the 2010 deadline. It is likely to take at least 15 years before all the specific projects identified in Annex III of these guidelines are completed.

Despite significant progress in the implementation of the TEN-T, a lot still remains to be done. The development of the TEN-T network is, and will continue to be in the coming years, one of the major challenges that the Community will have to tackle. Transport infrastructure is likely to be one of the pillars to build “bridges” between the Community and the acceding

<sup>31</sup> Total cost according to the targets and timeframe defined in the current guidelines (1996-2010), see annex on methodology and availability of data.



countries, to allow people to travel, goods to be transported as well as ideas to filter through the former borders.

However, the development of infrastructure is one of the main conditions – although not the only one – for ensuring that the network operates smoothly. It requires appropriate use of the infrastructure and high service quality, which can only be reached through an integrated and open transport market. This is the condition for achieving a high socio-economic return on the high investments required by some modes, in particular the railways. It also needs a clear definition of transport and network strategy as well as good cooperation and coordination within the Community.

## **7. CONNECTION WITH THIRD COUNTRIES**

A TEN-T comparable network is required at the moment of accession of the new Member States. Therefore, a Technical Adaptation of Decision 1692/96/EC on Community guidelines for the development of the trans-European transport network, was undertaken with the Candidate Countries during 2001. In this exercise the future TEN-T network was agreed upon both for road and rail and for inland waterways, inland ports, seaports and airports. These networks have been approved by the Council for all Candidate countries except Romania and Bulgaria.

The backbone of this external network of infrastructure is provided by the Pan-European Transport Network. These multi-modal Corridors and Areas, the so-called Helsinki Corridors/Areas, have a total length of about 48 000 km, of which 25 000 km are rail network and 23 000 km road network. Airports, sea and river ports and major freight terminals serve as transport nodes allowing modal switches along these long distance interconnections between Central and Eastern European countries.

Following the European Councils of Lisbon and Feira in 2000, and as part of the stabilisation and association process, particularly in the south-east European region (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia and Serbia and Montenegro), the Commission, working in conjunction with the International Financial Institutions and the countries concerned, developed a strategic transport network for the Western Balkans, which was approved at the international conferences in Tirana in May 2001 and Bucharest in October 2001.

## **ANNEXES**

- Annex 1: Notes on methodology and availability of data
- Annex 2: TEN-T priority projects (Essen list) completed
- Annex 3: TEN-T priority projects (Essen list) ongoing
- Annex 4: TEN-T priority projects proposed by the Commission in 2001
- Annex 5: Maps

## **ANNEX 1: Notes on methodology and availability of data**

Except where indicated, the figures on investments and costs in this report are expressed in January 1999 prices.

Most figures on total investments and total costs in this report (section 3.1 Modal networks and chapter 6 General assessment) are based on the results of the TEN-Invest study funded by the European Commission, which are available at [http://europa.eu.int/comm/ten/transport/documentation/index\\_en.htm](http://europa.eu.int/comm/ten/transport/documentation/index_en.htm). The study is based on data provided by Member States and Acceding countries and was carried out in close contact with Member States representatives in the Committee established in Article 18 of the guidelines. It gives the currently best available picture of investments in the trans-European transport network.

Investments in multi-annual projects are considered to be uniformly distributed along a project's life.

Total costs were estimated in the TEN-Invest study on the basis of past and future investments reported as decided by the Member States, plus an estimate of total costs of projects not yet decided, but necessary to achieve the targets defined in the guidelines. This implies an important degree of uncertainty, as quantitative targets are not always defined in the guidelines. In particular, the cost of projects not yet decided regarding ports, airports and traffic management systems cannot be included.

## ANNEX 2: TEN-T priority project (Essen list) completed

P9) Conv. rail link Cork-Dublin-Belfast-Larne-Stranraer	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date</i>	<i>total investment</i>
					<i>(EUR million)</i>	<i>(EUR million)</i>
	UK sections (excluding Belfast–Larne)	upgraded		1989–2001	119	119
	Republic of Ireland sections	upgraded		1989–2001	238	238
	<b>total:</b>		<b>502</b>		<b>357</b>	<b>357</b>

P10) Malpensa Airport (Milan)	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date</i>	<i>total investment</i>
					<i>(EUR million)</i>	<i>(EUR million)</i>
	Malpensa Airport	extension/new facilities		1995–2001	964	964
	<b>total:</b>				<b>964</b>	<b>964</b>

P11) Øresund Fixed road/rail Link between Denmark and Sweden	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date</i>	<i>total investment</i>
					<i>(EUR million)</i>	<i>(EUR million)</i>
	Øresund fixed link	tunnel, island and bridge	15.5	completed 2000	2 740	2 740
	Danish access routes	new motorway and rail	27	completed 1999	946	946
	Swedish access routes	new motorway, rail, etc.	10	completed 2001	472	472
	<b>total:</b>		<b>52.5</b>		<b>4 158</b>	<b>4 158</b>

**ANNEX 3: TEN-T priority project (Essen list) ongoing  
Data as reported to the Commission in 2003**

<b>1) High Speed train/combined transport North-South</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	Berlin Lehrter Bahnhof– Berlin/Ludwigsfelde	new section/upgrading	26	1994–2008	1 508	1 953
	Berlin/Ludwigsfelde– Halle/Leipzig	upgrading	205	1991–2002	1 534	1 534
	Halle/Leipzig–Nuremberg	new line/upgrading	192	1996–2012*	688	5 928
	Nuremberg – Munich	upgrading		2000-2006	1 286	2 486
	Munich–Kufstein	upgrading	97	2010–2015 <sup>1</sup> *	0	1 500
	Kufstein–Innsbruck	new line	70	1999–2009	250	1 900
	Innsbruck–Fortezza (Brenner Base tunnel)	new line and tunnel	55	2007–2015*	20	4 312
	Fortezza–Verona	new line/upgrading	190	1992–2002	553	553
	<b>total:</b>		<b>958</b>		<b>5 839</b>	<b>20166</b>

<b>2) High Speed train (PBKAL)</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	Belgian/German border– Cologne	new line/upgrading—250 km/h	69	1996–2007	322	500
	Cologne–Frankfurt	new line — 300 km/h	175	1990–2004	5 515	6 015
	London–Channel tunnel rail link	new line — 200 km/h	108	completed in 2007	4 480	7 200
	Belgium	new line/upgrading	321	1992–2006	3 004	4 690
	Netherlands	new line/upgrading	102	2000–2006	2 640	4 173
	Paris–Lille–Calais– Channel tunnel	new line	290	completed in 1994		
	<b>total:</b>		<b>1 065</b>		<b>15 961</b>	<b>22 578</b>

<sup>2</sup> Depending on the completion of the Brenner tunnel

3) High Speed Train South	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	Madrid-Barcelona	new line	-	1998–2005	5 893	8 795
	Barcelona-Figueras	new line	-	2004-2009	0	
	Figueras - Perpignan	new line	48	2004-2009	0	950
	Perpignan-Montpellier	new line	-	2008-2015	0	2 200
	Madrid-Vitoria-Irun	new line	-	2002-2010	1 596	7 218
	Irun – Dax	upgrade	-	2009-2015	0	100
	<b><i>total:</i></b>		<b><i>1 601</i></b>		<b><i>7 489</i></b>	<b><i>19 263</i></b>

4) High Speed Train East	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	Paris–Baudrecourt-Luxembourg	new line	-	completed 2007	1 358	4 034
	Baudrecourt–Strasbourg	new line	-	2010-2015	0	1 300
	Strasbourg-Appenweier	upgrade	145	2010-2015	0	150
	Saarbrücken-Mannheim	upgrade	-	2003-2007	0	183
	<b><i>total:</i></b>		<b><i>551</i></b>		<b><i>1 358</i></b>	<b><i>5 667</i></b>

5) Conventional rail/combined transport: Betuwe Line	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	total	upgrade/new line	160	1998-2007	2 913	4 712

6) High Speed Train / Combined Transport France-Italy	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	Lyon–Montmélian–Modane (St Jean de Maurienne)	new line (including 3 tunnels) — 300 km/h	140	completed 2010 <sup>2</sup> /15		6 250
Mont-Cenis tunnel	1— 300 km/h	70	completed 2017	200	6 100	
Bruzolo–Turin	new line — 300 km/h	47	completed 2011	7	2 350	
Turin–Milan	new line — 300 km/h	128	completed 2008	1 700	6 878	
Milan–Verona/Padua	new line — 300 km/h	230	completed 2011	0	7 000	
Padua–Mestre	new line — 200 km/h	30	completed 2007		440	
Venice–Trieste border	new—300 km/h	125	2003–2015	0	3 000	
<b>total:</b>		<b>770</b>		<b>1 900</b>	<b>32 218</b>	

7) Greek motorways, Pathe and Via Egnatia)	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	Pathe	upgrade and new construction	800	1996–2008	4 654	8 389
Via Egnatia	mainly new construction	780	1996–2006	2 277	4 215	
<b>total:</b>		<b>1 580</b>		<b>6 931</b>	<b>12 604</b>	

<sup>2</sup>

Chartreuse tunnel

<b>8) Multimodal link Portugal-Spain – Central Europe</b>	<i>corridors (EUR million)</i>	<i>rail (EUR million)</i>	<i>road (EUR million)</i>	<i>airports (EUR million)</i>	<i>ports (EUR million)</i>	<i>total</i>
	Lisbon–La Coruña-Sines					
	• Portuguese section	540	899.5			
	• Spanish section	1351	899.5			
	Lisbon–Valladolid:					
	• Portuguese section	1 491	2 253			
	• Spanish section	188	240			
	Lisbon-Faro	1 258				
	Lisbon–Seville					
	• Portuguese section		566			
	• Spanish section		188			
	<i>total Portugal</i>	<i>3281</i>	<i>3718.5</i>	<i>3430</i>	<i>1082</i>	
	<i>total Spain</i>	<i>1 539</i>	<i>1327.5</i>	<i>-</i>	<i>-</i>	
	<b><i>total:</i></b>	<b><i>4820</i></b>	<b><i>5046</i></b>	<b><i>3430</i></b>	<b><i>1082</i></b>	



<b>P12) Nordic Triangle (rail/road)</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	road (Finnish section) except Muurla-Lohjanharju	upgrade to motorway	1 100	by 2010*	216	852
Muurla-Lohjanharju	upgrade to motorway		by 2010		369	
rail (Finnish section) except Kerala-Lahti	rail upgrade		2015	309	601	
Kerala-Lahti	rail upgrade		2006	0	331	
road (Swedish section)	upgrade to motorway	1 400	1996–2015	175	3 611	
rail (Swedish section)	rail upgrade		1995–2015	562	5 262	
<b>total:</b>		<b>2 517</b>		<b>2 223</b>	<b>6 966</b>	

<b>P13) Ireland-UK-Benelux road link</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)timetable</i>		<i>investment to date total investment (EUR million) (EUR million)</i>	
	UK sections	new and upgraded roads	1 150	1992–2010	549	1 349
Republic of Ireland sections	new and upgraded roads	380	1989–2010	2600	2 600	
<b>total:</b>		<b>1 530</b>		<b>3149</b>	<b>3949</b>	

<b>P14) West Coast Main Line (rail)</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date total investment (EUR million) (EUR million)</i>	
	West coast main line	rail upgrade — 220 km/h	850	1994–2008	1002	16900
<b>total:</b>		<b>850</b>		<b>1002</b>	<b>16900</b>	

**ANNEX 4: TEN-T priority project, proposed by the Commission in 2001  
Data as reported to the Commission in 2003**

<b>1) High Speed train/combined transport North-South, extension</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date (EUR million)</i>	<i>total investment (EUR million)</i>
	<i>new:</i> Verona–Bologna	upgrade — 200 km/h	113	completed in 2006	50	600
	<i>new:</i> Milan–Bologna	new line	200	completed in 2006	1735	6 335
	<i>new:</i> Bologna–Florence	new line	79	completed in 2007	2 400	4 300
	<i>new:</i> Florence–Rome	re-electrification from 3 kV to 25 kV	232	in service	351	
	<i>new:</i> Rome–Naples	new line	204	completed in 2004	3 900	5 000
	<b><i>total extension:</i></b>		<b>828</b>		<b>15 877</b>	

<b>2) High Speed Train South</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date (EUR million)</i>	<i>total investment (EUR million)</i>
	<i>new:</i> Montpellier–Nîmes	new line	50	completed 2015		1 50
	<b><i>total extension:</i></b>		<b>50</b>			<b>790</b>

<b>3) Global navigation and positioning satellite system Galileo</b>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date (EUR million)</i>	<i>total cost (EUR million)</i>
	Galileo		2003-2008	100	3200

<b>4) High capacity rail link across the Pyrenees</b>	<i>route</i>	<i>type of work</i>	<i>distance (km)</i>	<i>timetable</i>	<i>investment to date (EUR million)</i>	<i>total investment (EUR million)</i>
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	trans-Pyrenean rail link	new line	150	2013–20	5 000 (1)
	<b>total:</b>		<b>150</b>		<b>5 000</b>

5) East European combined transport/high-speed train	route	type of work	distance (km)	timetable	investment to date (EUR million)	total investment (EUR million)
	Stuttgart–Ulm	new line/upgrading	166	2004-2012		1 266
	Munich–Salzburg		141			
	German section	upgrading		2002-2015	12	738
	Austrian section	upgrading		2005-2015		160
	Salzburg–Vienna	upgrading	303	1990-2012	1 356	6 000
	<b>total:</b>				<b>1 368</b>	<b>8 164</b>

6) Danube river improvement between Vilshofen and Straubing	route	type of work	distance (km)	timetable	investment to date (EUR million)	total investment (EUR million)
	Straubing–Vilshofen	upgrade of waterway	70			137
	<b>total:</b>		<b>70</b>			<b>137</b>

7) High-speed rail interoperability on the Iberian peninsula	Timetable	Investment to date	Total cost
	2001-2010	742	23746

8) Fehmarn belt: fixed link between Germany and Denmark	route	type of work	distance (km)	timetable	investment to date (EUR million)	total investment (EUR million)
	Fehmarn Strait	road and rail bridge and/or tunnel	19	2007-2014		2 800
	<b>total:</b>		<b>19</b>			<b>2 800</b>

## **ANNEX 5: Maps**

- Evolution of the TEN-T road network between 1996 and 2001.  
This map shows the sections of the network completed between 1996 and 2001.
- Evolution of the TEN-T rail network between 1996 and 2001.  
This map shows the sections of the network completed between 1996 and 2001.
- TEN-T inland waterways network at 1996 and 2001 and TEN-T inland ports.
- TEN-T airports and their classification.
- The A category TEN-T maritime ports.
- The Priority Projects as proposed by the Commission proposal on the Revision of the Community Guidelines, COM(2003)564