PANORAMA OF THE EUROPEAN UNION

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2003 EDITION

Panorama of transport

Statistical overview of transport in the European Union

Part 1

Data 1970-2001

NOW WITH DATA ON CANDIDATE COUNTRIES

7

EUROPEAN COMMISSION

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THEME 7
Transport

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It can be accessed through the Europa server (http://europa.eu.int).

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FOREWORD

The Panorama of Transport sets out to describe, via annual statistics, the most important features of transport in the European Union. In so doing it provides European citizens and decision makers with information on medium and long term trends in the transport economy.

This publication describes transport not only in terms of the quantities of freight and passengers moved and the vehicles and infrastructure used, but also as part of the economy, the environment and health, as a factor in our quality of life. Transport statistics are often an indicator of economic activity and European integration, as is shown by the notable increase in the proportion of international intra-EU transport, but they can also reflect short-term problems, for example the serious and immediate impact on aviation of security problems or fuel price increases.

The first edition of the Panorama published in 1999 dealt mainly with inland transport, with particular emphasis on freight transport for which Community statistics have been collected for many years. The second edition, published in 2001, also included air transport, for which international passenger transport has been increasing, since 1993 - the first year in which data were collected by Eurostat - at a rate close to a doubling every ten years. The events of 11 September 2001 have noticeably slowed down this development.

The third edition covered for the first time all main modes of transport as it also included maritime transport, a domain in which intra-EU trade has experienced a spectacular development, similar to that of road transport. Whether expressed as total tonnes transported, maritime transport is by far the most important mode of freight transport for the European Union, counting intra-EU and extra-EU transport together.

This fourth edition of the Panorama puts a special emphasis on the latest road freight transport statistics collected under the recent EU regulation; it also gives a first overview of available data on the ten acceding countries and the remaining candidate countries. Furthermore, certain chapters of this edition include information on the EFTA states.

The Panorama is designed to provide statistics to support the development of Community transport policy. In particular, in order to meet the challenge of a transport policy which contributes to economic development while improving our quality of life, the European Commission proposed some sixty measures in its White Paper adopted in September 2001: *European transport policy for 2010: time to decide* (www.europa.eu.int/comm/energy.transport/en/lb.en.html).

The Panorama exploits the wide range of data available in the Eurostat dissemination database (New Cronos), not only on transport but also on the economy, on the environment and on energy, bringing these data together and explaining them. As most of the data used for this publication have been extracted from the Eurostat database during the second and third quarter of 2003, and as there is a need of good data coverage among all the EU countries, the year 2001 is in most cases the most recent year for which data were available.

The user who wishes to go further can find more information on Eurostat's home page: http://europa.eu.int/comm/eurostat. More up to date, more specialized or more detailed dissemination products can be obtained, such as the DVD-ROM *Everything on transport statistics*, which includes all data, publications and documents on transport available at Eurostat. In particular, this DVD-ROM contains, at the date of its issue, relatively fresh data extracted from the Eurostat dissemination database one or two months earlier.

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PANORAMA OF TRANSPORT

Statistical overview of the transport sector in the European Union

CONTENTS

1. The transport sector in the European Union

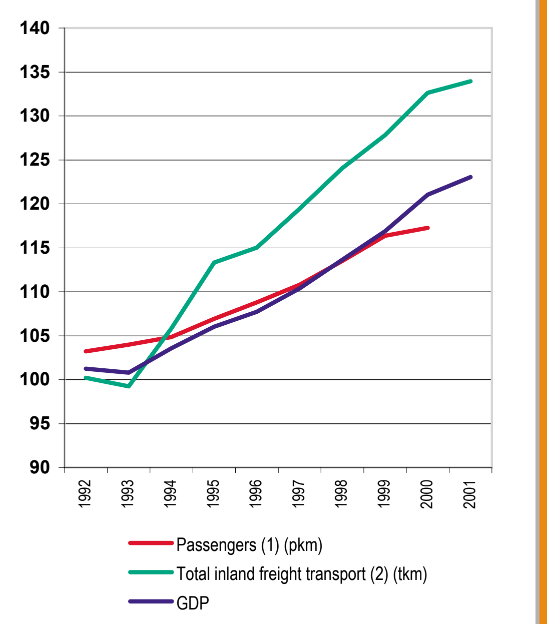
Transport is an integral part of the Treaty establishing the European Community (see box), and Community statistics on transport have played an essential role in implementing EU policies related to transport.

Trends in transport mirror economic trends. Transport has shown a steady growth since the 1970s, although the trend has been less regular in goods traffic than in passenger traffic (see Graph 1.1). Factors that determine this global development are the changes in the structure and location of the manufacturing industries, changes in production methods due to demands for 'just-in-time' shipments, the growing requirements for staff mobility in the services sector and the general increase of car ownership, leisure time and disposable income.

A sector in its own right

The transport services sector in the European Union delivers benefits in its own right: the sector accounts for an estimated 4 % of the Union's gross national product and employs approximately 6.3 million people. The latter figure represents around 4.1 % of all persons employed in the EU. An additional 2 million persons are employed in the transport equipment industry, and over 6 million in transport related industries.

Graph 1.1: EU-15 transport growth (1990 = 100)



(1) : Pass. cars, buses & coaches, tram & metro, rail, air.
(2) : Road, rail, inland waterways.
Sources: Eurostat, DG Energy and Transport.

Table 1.2: EU-15 average annual growth by transport mode (%)

	1991-2001	1996-2001	2000-2001
Total inland freight transport[1]	**+3.0 %**	**+3.1 %**	**+1.0 %**
Road goods transport	+3.7 %	+3.4 %	+2.0 %
Rail goods transport	+0.4 %	+1.6 %	-3.1 %
Inland ww. goods transp.	+1.7 %	+2.5 %	-1.2 %
Air transport - passengers[2]	+6.5 %[3]	+6.2 %	-2.2 %
Maritime transport - goods handled	:	+0.7 %[4]	+0.5 %

(1) road, rail, inland waterways.
(2) international traffic only.
(3) 1993-2001.
(4) 1997-2001.
Sources: Eurostat, DG Energy and Transport.

Each day, the transport industries and services of the European Union have to get more than 150 million people to and from work, enable at least 100 million trips made in the course of the work, carry 50 million tonnes of goods, deal with 15 million courier, express and parcel shipments apart from serving the needs of travel and trade outside the boundaries of the European Union.

Apart from the economic importance of the transport sector, the ever-increasing mobility of citizens is today part of everyday life and its significance for every individual should not be underestimated.

In 2000, average intra-EU passenger transport demand was 32.7 km per person/day on average (taking only into account transport by passenger car, buses and coaches and railways).

Few short-term alternatives to road transport

Table 1.2 and Graph 1.3 shows that road haulage has been constantly growing. It continues to take a largely dominant position in freight transport. Meanwhile rail's share of the freight market has slightly decreased in the past 30 years, but has remained stable over the last decade (+0.4 % average annual increase for the period 1991-2001). The transport performance of inland waterway vessels has been growing only slowly over the last 30 years, but it is at least surprising that this performance is obtained with a massively reduced vessel fleet.

The geographical characteristics of a country influence the mode of transport used for the transport of goods (the so-called modal split). For instance, 71% of the total cargo volume (expressed in tonnes, and considering all the 'inland modes') carried from the Netherlands to Germany has been forwarded over inland waterways. Due to a different rail gauge in Spain and the presence of the Pyrenees, goods transport to and from the Iberian Peninsula essentially takes place on roads. Road is also the main mode for goods transport to peripheral regions of the European Union, like Finland, Sweden and Greece. Maritime transport often constitutes an alternative, and activities are undertaken to promote the «motorways of the sea» – concept (see chapter 2.3 – TENs).

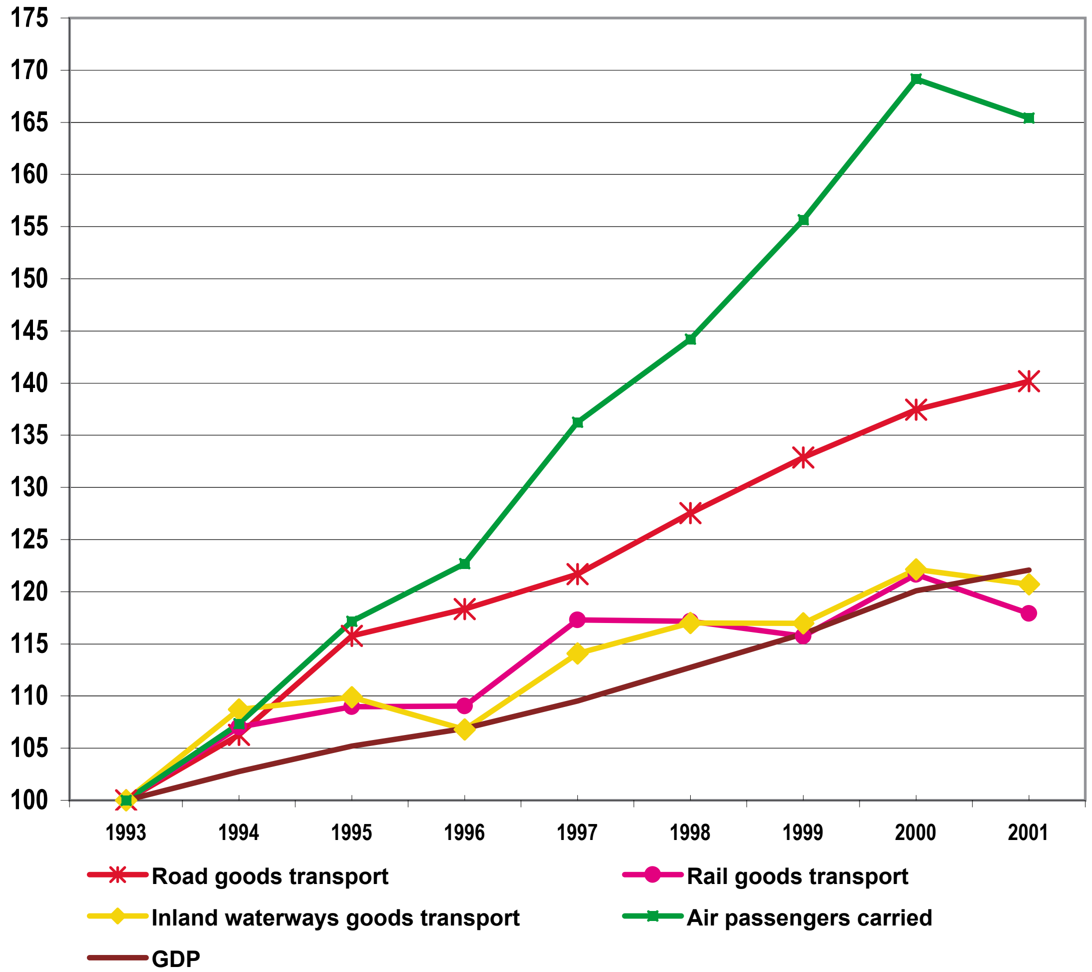
Sudden drop in air passenger transport in 2001

Air transport has experienced the fastest growth in recent years. Passenger data available at Eurostat show that the number of passengers in international intra- and extra-EU transport passed from 256 million in 1993 to 424 million in 2001. This corresponds to an average annual increase of 6.5 %. Average annual increase was even higher up to 2000 (+ 8 % for the period 1993-2000) but air passenger numbers dropped significantly during the second semester of 2001 following the terrorist attacks of the 11th of September 2001. The passenger numbers in 2001 stood 2.2 % lower than the previous year international intra- and extra-EU passengers, excluding domestic transport.

Physical links a pre-requisite to boost economic growth

The establishment and development of trans-European networks (TEN) in the area of transport, telecommunication and energy infrastructures

Graph 1.3: Development of EU-15 transport: growth by mode (1993=100)



Source: Eurostat.

has been a community policy since the Maastricht Treaty (see box). The transport TEN covers all modes of transport and a number of projects have now been completed (see Chapter 2.3). New projects have gradually been added, most of them with a time horizon 2020. Various projects now include the Candidate Countries. The availability of an adequate and sustainable transport network is often a pre-requisite for economic growth.

(Extracts from the Treaty establishing the European Community, incorporating changes made by the Treaty of Amsterdam)

TITLE V

TRANSPORT

Article 70

The objectives of this Treaty shall, in matters governed by this Title, be pursued by Member States within the framework of a common transport policy.

Article 71

1. For the purpose of implementing Article 70, and taking into account the distinctive features of transport, the Council shall, acting in accordance with the procedure referred to in Article 251 and after consulting the Economic and Social Committee and the Committee of the Regions, lay down:

(a) common rules applicable to international transport to or from the territory of a Member State or passing across the territory of one or more Member States;

(b) the conditions under which non-resident carriers may operate transport services within a Member State;

(c) measures to improve transport safety;

(d) any other appropriate provisions.

(...)

Article 80

1. The provisions of this Title shall apply to transport by rail, road and inland waterway.

2. The Council may, acting by a qualified majority, decide whether, to what extent and by what procedure appropriate provisions may be laid down for sea and air transport.

(...)

TITLE XV

TRANS-EUROPEAN NETWORKS

Article 154

To help achieve the objectives referred to in Articles 14 and 158 and to enable citizens of the Union, economic operators and regional and local communities to derive full benefit from the setting-up of an area without internal frontiers, the Community shall contribute to the establishment and development of trans-European networks in the areas of transport, telecommunications and energy infrastructures.

Within the framework of a system of open and competitive markets, action by the Community shall aim at promoting the interconnection and interoperability of national networks as well as access to such networks. It shall take account in particular of the need to link island, landlocked and peripheral regions with the central regions of the Community. (...)

2. Transport infrastructure

2.1. General development

On a global scale, the EU offers a dense transport network. Increasing demand for transport services, both for passengers and goods, have had an impact on the development of the infrastructures. This development has however its particularities, both with regard to the individual Member States (see Chapter 2.2) and the mode of transport in question.

Moreover, the unprecedented future enlargement will give the European Union a truly continental dimension. The first challenge in making enlargement a success will be to connect the future Member States to the transport network; this is a pre-condition for their economic development, based on anticipated growth in transport, as was the case with the accession of Spain, Portugal and Greece.

Motorway network more than tripled since 1970

In 2000, the total length of railways in EU-15 amounted to 156 353 km (see Table 2.1). Although half of this network is now electrified, the overall length in use steadily decreased until 1998 (see Graph 2.2). Only since 1999, a modest increase in the overall network length could be registered. Globally however, it stands 8 % lower than in 1970. As far as network density is concerned, EU-15 offers 48.3 km of railways per 1 000 square kilometres (2000), considerably more than in the United States (30.6 km/1 000 km² in 1999, including Alaska and Hawaii and inland waters) but less than in Japan (53.5 km/ 1 000 km² in 1999).

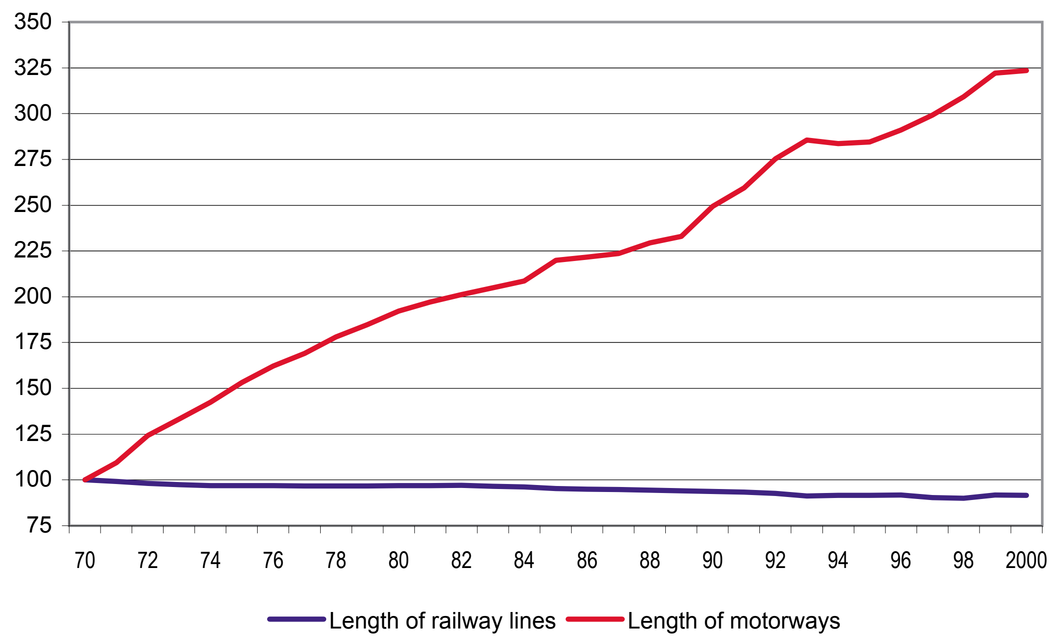
As would be expected, the road network, comprising motorways, regional highways and roads as well as local roads is the densest

Table 2.1: Network lengths in EU-15 (km)

	1970	2000	Change 1970 - 2000
Rail	170 662	156 353	-8%
Roads	2 639 646	3 254 743	+23%
of which motorways	*15 864*	*51 559*	+225%
Pipelines	11 441	21 675	+89%
Inland waterways	31 748	28 381	-11%
TOTAL NETWORK	**2 853 497**	**3 512 711**	**+23%**

Sources: Eurostat/ECMT/UNECE, national statistics.

Development of rail and motorways network in EU-15 (1970=100)



Source: Eurostat/ECMT/UNECE.

transport network. Given that the existing definition of the term 'local roads' allows various interpretations by Member States (leading to results altering comparability) data officially reported by Member States have been used. Local roads make up almost two thirds of the entire road network.

The total length of the road network in EU-15 amounted to over 3 254 thousand km in 2000 of which 51 559 km consisted of motorways (1.6%). The length of the motorway network in the EU more than tripled in less than three decades (see Graph 2.2). When relating the length of the entire EU motorway to the territory, it appears that the network density is 15.9 km per 1000 km^2. The motorway network of the USA totals 74 000 km, with a density of 7.5 km/1000 km^2 (1999). The equivalent figures for Japan are 6 600 km and 17.5 km/1000 km^2 (1999). Japan's average network density is over the value of the EU,

Inland waterways decreased most since 1970

Only 9 of the 15 Member States are able to offer significant transport using inland waterways. In 2000, the total length of usable inland waterways (comprising rivers, canals and navigable lakes) amounted to 28 381 km of length which represents a density of 8.7 km per 1 000 km^2. This density is twice as much compared to the United States in 1999 (4.3 km per 1 000 km^2, approximately 41 800 km of length, excluding the Great Lakes).

This network of lakes, rivers and artificially built canals offers a unique transport system in the nine Member States, still offering considerable potential - especially with regards to the Balkan countries - since the opening of the Main – Danube canal. Nearly the entire network of navigable waterways is used for the transport of goods. Examples are few for the transport of passengers other than for leisure purposes (like scheduled passenger lines on the North Italian lakes and transport in Venice).

Pipelines: limited length but considerable transport capacity

In addition to the three main inland transport modes, the 21 675 km of pipelines should be mentioned, a network the length of which in 2000 constituted 13.9 % of the rail and 76 % of the inland waterway network. For statistical purposes, only oil pipelines are considered here.

In the present publication, the pipeline network will not be considered as a main inland transport mode since oil pipelines are only dedicated to the transport of a very restricted group of goods (liquid oil products). However, when considering the volumes forwarded, it becomes obvious that this mode is far from being negligible.

Decrease of 8 % for EU rail network

The total length of the three 'classic' networks experienced a considerable growth: from 2.84 million km in 1970 to 3.44 million km in 2000. This represents an increase of 21 %. The most important share of this growth can be attributed to the road network with a growth of 23 %, while the rail and inland waterways network decreased by 8 % and 11 % respectively. On the other hand, the dedicated high-speed lines increased from 285 km in 1981 to 2 366 km in 2000.

In terms of modal share, the railway network makes up only 4.5 % (1970: 6.0 %) of the total length of the transport network in 2000 while the road network amounts to 94.6 % (1970: 92.9 %) and inland waterways to 0.8 % (1970: 1.1 %).

Airports: intermodal nodes by nature

The airspace over the European Union can be considered as one of the busiest in the world. Obviously, in aviation one cannot talk about 'network length' and a classification of airports on the basis of their technical or infrastructural features is not useful for statistical purposes: 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.

In 2001, the EU featured 204 airports handling at least 100 000 passengers per year. The 30 or so largest airports in the European Union handle three quarters of total passengers and about 90 percent of extra-Community international traffic. In the frame of the guidelines for the transport TENs (trans-European networks - see Chapter 2.3), those airports are regarded as International Connecting Points, although they also take most intra-Community traffic as well. A further 60 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.

Infrastructure investments are planned and undertaken at many of the major EU airports, particularly with regards to connections to the rail, especially high-speed rail, network.

Seaports long neglected

The crucial role played by seaports in European Union transport is evident: 328 million persons passed through EU seaports in 2001 and the total tonnage of goods handled is estimated at 3 000 million tonnes, 70% of all trade with third countries is channelled through the ports. Short sea shipping along the EU's and its neighbouring countries' coasts moves about one third of all goods (considering all modes) – with considerable growth. Hence the need for efficient infrastructures and services.

For quite a while, seaports have not been at the centre of common transport policy. Investment in infrastructures gradually declined between 1970 and the late 1980's. At the beginning of the 1990's however, investment in ports picked up significantly. Sustainability and intermodality are two key-words that pushes the Commission to take various actions aiming at better connections between ports and the rail and inland waterway networks together with improvements in the quality of seaport services. The concept of «motorways of the seas», aiming at better linking countries isolated by natural barriers as a substitute for saturated land corridors (see chapter 2.3 Trans-European transport networks) emphasises the Commission's efforts.

At EU-level in 2001, there are 261 maritime ports handling over 1 million tonnes of goods per year. Since many years, the top-five ports remain the same: Rotterdam, Antwerp, Marseille, Hamburg and Le Havre). The main passenger ports correspond to those offering the major European ferry connections. Data for the period 1997-2001 suggest that the construction of fixed links (tunnels, bridges) had a considerable impact on the passenger frequentation of ports (see Chapter 5.2).

Candidate Countries

Table 2.3 gives a general overview of the network length of the various states that form the Candidate Countries group. Keeping in mind that certain countries do not offer several modal networks, it appears that compared to 1995, the rail network decreased by 4%. Conversely, the motorway network increased by an impressive 36% in this relative short period. Similarly, the length of pipelines has increased by 21%, totalling 12 248 km, which represents 57% of the length of the pipeline network of the EU-15 Member States. The length of the inland waterway network did not change significantly.

Within the Candidate Countries group, one could expect a considerable weight of Turkey on the basis of its considerable geographical size. With regards to transport network lengths, this does not apply (see Chapter 2.2 – Table 2.9 for details). However, when looking at air transport for instance, the weight of Turkey is high, mainly induced by an important tourism sector.

The economic catching-up of numerous regions in the future new Member States will depend on good access to the major European axes, efficient interconnections, and in particular good cross-border connections. Since a couple of years, various financial instruments are used to assist the Candidate Countries in their preparation for accession. Resources have been allocated by the Commission according to a set of criteria, taking into account the specific socio-economic and environmental situation. Various projects were launched, focussing mainly on the rehabilitation and construction of roads, motorways and railways, with regard to strategic priorities of the TEN-T.

Table 2.3: Network lengths in the Candidate Countries (km)

	1995	2001	Change 1995 - 2001
Rail	75 568	72 297	-4%
Motorways	3 785	5 135	+36%
Pipelines	10 122	12 248	+21%
Inland waterways	9 140	9 026	-1%
TOTAL	98 615	98 706	+1%

Source: Eurostat/ECMT/UNECE.

EFTA Countries

With regards to transport networks, the EFTA countries are a quite heterogeneous group. Differences in size, population density and geographical location notably influence the availability of modal networks and make the calculation of an EFTA aggregate questionable.

Iceland obviously does not offer railways and has no motorways or (oil-) pipelines. Liechtenstein, with 160 square kilometres 16 times smaller than Luxembourg, offers only 18.5 km of railways, the network of which is operated by the Austrian railways. Norway's specific topographic features together with its uneven population distribution call for quite unique transport networks, and the length of the Norwegian motorway network is only 144 kilometres. Switzerland is characterised by the central alpine chain and has to cope with substantial transit traffic. Transport demand growth has been almost completely absorbed by road transport and eliminating bottlenecks in the rail network has proven a necessary but insufficient condition to promote a re-equilibrium of the modal split. A modal shift from road to rail seems only be possible by improving the overall quality of the rail transport supply.

2.2. Physical characteristics of transport networks

The situation in most of the Member States is similar to the general trends and developments at EU level, outlined in the previous chapter. However, an analysis by mode shows to what extent the individual Member States follow the general EU trend.

Rail network reduced by 8% since 1970

At EU-15 level, the total length of the railway network decreased by 8 % between 1970 and 2000 (see Table 2.6). The railway network decreased most in Portugal and Belgium (22 and 18 % respectively), and remained the most stable in Sweden, Finland and Luxembourg.

Table 2.4 outlines that in 2000, the railway network of Germany was the longest in EU-15: with 36 652 km this network constitutes 23.4 % of the total EU-15 network. The French railway network comes second with 32 515 km or 20.8 %. The UK and Italian network follow with 10.9 % and 10.6 % respectively. These four Member States alone stand for two thirds (65.7 %) of the entire EU network.

Highest rail density in Belgium

In terms of network density things look different: despite a 18 % decrease since 1970, Belgium still has the highest rail network density with 113.8 km/1 000 km^2, followed by Luxembourg (105.4 km/1 000 km^2) and Germany (102.7km/ 1 000 km^2). The lowest density within the EU-15 can be found in Finland (17.3 km/1 000 km^2) and Greece (17.4 km/1 000 km^2).

Table 2.5 Railways: Dedicated high-speed rail network

Lines capable of speeds of 250 km/h or more						
	Belgium	Germany	Spain	France	Italy	EU-15
1995	-	-	-	1 124	-	1 124
1996	12	434	376	1 152	237	2 211
1997	71	434	376	1 152	259	2 292
1998	71	486	376	1 147	259	2 339
1999	74	491	377	1 147	259	2 348
2000	74	633	377	1 147	259	2 490
2001	73	633	377	1 395	259	2 737

Source: UIC.

The case of Finland illustrates the typical situation of a country with a large territory/low population ratio. One would expect to find a similar situation in neighbouring Sweden. However, figures show that network density in Sweden (25.7 km / 1 000 km^2) is almost the same as in Spain (27.2 km/1 000 km^2).

Sweden and Finland have far more than 100 km of tracks per 100 000 inhabitants whilst Austria, in third position, follows with 77 km/100 000 inhabitants. It should be noted that the two Nordic countries feature a very uneven population distribution, a factor that is not considered in these ratios. The low rail network density for Greece is mainly due to the geographical characteristics of the country: numerous islands and extensive mountainous regions.

Table 2.4: Length of transport networks 2000 - key indicators

	Railways[1]				Motorways		
	km	% electrified	km/100 000 inhab.	km/1 000 km^2	km	km/100 000 inhab.	km/1 000 km^2
Belgium	3 471	78	34.0	113.8	1 702	16.6	55.8
Denmark	2 047	31	38.3	47.5	922	17.3	21.4
Germany	36 652	52	44.6	102.7	11 712	14.3	32.8
Greece	2 299	0	21.8	17.4	*707*	6.7	5.4
Spain	*14 303*	54	36.2	28.3	9 049	22.9	17.9
France	32 515	43	53.7	59.8	9 766	16.1	18.0
Ireland	1 919	2	50.7	27.3	103	2.7	1.5
Italy	16 499	66	28.6	54.8	6 478	11.2	21.5
Luxembourg	274	95	62.5	105.4	115	26.2	44.2
Netherlands	2 802	74	17.6	67.5	2 289	14.4	55.2
Austria	6 281	60	77.5	74.9	1 633	20.2	19.5
Portugal	2 814	32	28.1	30.6	1 482	14.8	16.1
Finland	5 854	41	113.1	17.3	549	10.6	1.6
Sweden	*11 560*	75	130.5	25.7	1 506	17.0	3.3
United Kingdom [2]	17 067	30	28.6	69.9	3 546	5.9	14.5
EU-15	**156 357**	**50**	**41.4**	**48.3**	**51 559**	**13.6**	**15.9**

(1) Railways: Data for UIC member railways.
(2) United Kingdom data refer to Great Britain.
Sources: Eurostat / ECMT / UNECE, UIC, IRF, national statistics.

Estimates in italic.

Table 2.6 : Length of transport networks by country (km)

- Railways[1]
- Motorways
- Other roads[2]
- Pipelines[3]
- Inland waterways

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	EU-15	EU-15 index 1970 =100
1970	4 232	2 352	43 777	2 571	13 668	36 117	2 189	16 089	271	3 148	5 907	3 591	5 870	11 550	19 330	170 662	100
	488	184	5874	11	387	1 553	0	3 913	7	1 209	478	66	108	403	1 183	15 864	100
	93 539	62 592	*555 000*	34 692	139 221	710 384	86 695	281 405	4 949	81 890	102 053	41 763	73 444	110846[4]	356 155	*2 623 782*	100
	52	-	2 260	-	1 099	3 609	-	1 860	-	323	604	-	-	-	1 634	11 441	100
	1 553	-	6 808	-	-	7 433	-	2 337	37	5 599	350	-	*6 000*	-	1 631	31 748	100
1980	3 971	2 015	42 765	2 461	13 542	34 382	1 987	16 133	270	2 760	5 847	3 588	6 096	11 382	18 030	165 229	97
	1 203	516	9 225	91	2 008	5 264	0	5 900	44	1 780	938	132	204	850	2 683	30 838	194
	124 710	68 405	*594 000*	37 367	147 644	796 514	89 796	290 370	5 050	91 628	*103 553*	*50 410*	75 387	96504 [4]	337 077	*2 811 911*	107
	458	77	2 880	-	1 753	5 254	-	3 069	-	391	777	-	-	-	3 166	17 825	156
	1 510	-	6 697	-	-	6 568	-	2 337	37	4 843	350	-	6 057	-	1 631	30 030	95
1990	3 479	2 344	40 981	2 484	12 560	34 260	1 944	16 086	271	2 798	5 624	3 592	5 867	10 801	16 914	160 005	94
	1 631	601	10 854	190	4 693	6 824	26	6 193	78	2 092	1 445	316	225	939	3 180	39 287	248
	138 575	70 173	*626 000*	38 312	156 243	801 274	92 303	297 419	5 013	102 498	*104 807*	61 222	77 080	132619 [4]	378 934	*2 949 853*	112
	301	444	3 038	-	2 678	4 948	-	4 086	-	391	777	-	-	-	2 422	19 085	167
	1 513	-	6 669	-	-	6 197	-	*1 366*	37	5 046	351	-	6 072	-	1 631	28 882	91
1995	3 368	2 349	41 719	2 474	12 280	31 939	1 945	15 998	275	2 739	5 672	2 850	5 880	9 782	16 999	156 269	92
	1 666	796	11 190	420	6 962	8 275	70	6 401	123	2 208	1 596	687	394	1 231	3 308	45 327	286
	142 126	70 525	*631 000*	38 265	155 655	951 097	91 432	305 500	5 046	111 144	104 715	68 045	77 722	136233[4]	387 799	*3 140 071*	120
	294	409	2 460	-	3 691	4 830	-	4 235	-	391	777	-	-	-	2 602	19 689	172
	1 531	-	6 663	-	-	5 962	-	1 466	37	5 046	351	-	6 120	-	1 153	28 329	89
1997	3 422	2 232	38 450	2 503	12 294	31 754	1 908	16 030	274	2 805	5 672	2 856	5 865	11 168	16 991	154 224	90
	1 679	855	11 309	*500*	7 750	8 864	94	6 445	118	2 360	1 613	797	444	1 423	3 412	47 663	300
	143 235	70 582	*633 000*	*38 300*	155 045	964 646	95 627	306 900	5 053	111 212	104 739	*69 340*	77 796	136884 [4]	390 918	*3 166 393*	121
	300	336	2 460	-	3 691	5 746	-	*4 235*	-	*391*	777	-	-	-	3 936	21 872	191
	1 540	-	6 673	-	-	6 051	-	1 466	37	5 046	351	-	6 154	-	1 153	28 471	90
1998	3 410	2 232	38 126	2 503	12 303	31 727	1 909	16 041	274	2 808	5 643	2 794	5 867	11 156	16 847	153 640	90
	1 682	861	11 427	*500*	8 269	9 303	103	6 453	115	*2 360*	1 613	1 252	473	1 439	3 421	*49 271*	311
	144 168	70 601	*632 000*	*39 000*	155 004	971 064	95 630	*307 000*	*5 060*	*111 212*	104 748	*70 000*	77 894	136593 [4]	392 545	*3 175 926*	121
	300	*336*	2 370	-	3 691	5 746	-	*4 235*	-	*391*	777	-	-	-	3 953	*21 799*	191
	1 529	-	6 740	-	-	5 732	-	1 477	37	*5 046*	351	-	7 787	-	1 153	*29 852*	94
1999	3 472	2 324	37 535	2 299	14 310	32 105	1 919	16 092	274	*2 802*	6 209	2 813	5 836	11 498	17 064	*156 552*	92
	1 691	902	11 515	700	8 893	9 626	103	6 478	115	2 291	1 634	1 441	512	1 484	3 529	*50 914*	321
	144 791	70 699	*632 000*	*39 000*	154 876	974 722	95 627	*307 000*	*5 060*	*111 212*	104 378	*70 000*	77 900	137572 [4]	410 745	*3 198 010*	122
	300	330	2 370	-	3 698	5 746	-	4 364	-	*391*	777	-	-	-	3 603	*21 579*	189
	1 529	-	6 754	-	-	5 576	-	1 477	*37*	*5 046*	351	-	7 842	-	1 153	*29 765*	94
2000	3 471	2 047	36 652	2 299	14 303	32 515	1 919	16 499	274	*2 802*	6 281	2 814	5 854	11 560	17 067	*156 357*	92
	1 702	922	11 712	707	9 049	9 766	103	6 478	115	2 289	1 633	1 482	549	1 506	3 546	51 559	325
	145 650	70 710	*632 000*	*39 000*	154 508	977 325	95 627	*307 000*	*5 060*	*111 212*	104 425	*70 000*	77 993	137600 [4]	412 767	*3 203 277*	122
	300	330	2 370	-	3 780	5 746	-	4 347	-	*391*	777	-	-	-	3 634	*21 675*	189
	1 529	-	6 754	-	-	5 789	-	1 477	*37*	*5 046*	351	-	7 842	-	1 153	*29 978*	94

(1) Railways: Length in use. Data refer to main railway companies (UIC-members).
(2) Due to differences in definition, comparability is limited/low.
(3) Pipelines: only oil-pipelines longer than 40 km are considered.
(4) does not include private roads open to the public (approx. 74000 km).
Sources: Eurostat, UIC, UNECE, national statistics.

Estimates in italic.

Table 2.7: Main* airports handling at least 80% of the country's total passenger traffic in 2001

BELGIUM (1 main airport)**	Shannon
Bruxelles / National	**ITALY (14 main airports)**
DENMARK (5 main airports)	Roma
København	Milano / Malpensa
GERMANY (17 main airports)	Milano / Linate
Frankfurt-Main	Venezia
München	Napoli
Düsseldorf	Catania
Berlin-Tegel	**LUXEMBOURG (1 main airport)**
Hamburg	Luxembourg
Stuttgart	**NETHERLANDS (2 main airports)**
GREECE (21 main airports)	Amsterdam
Athinai	**AUSTRIA (6 main airports)**
Iraklion	Wien
Thessaloniki	Salzburg
Rodos	**PORTUGAL (6 main airports)**
Kerkira	Lisboa
Kos	Faro
SPAIN (34 main airports)	Porto
Madrid / Barajas	**FINLAND (15 main airports)**
Barcelona	Helsinki
Palma de Mallorca	Oulu
Malaga	Rovaniemi
Las Palmas / Gran Canaria	**SWEDEN (19 main airports)**
Tenerife	Stockholm / Arlanda
Alicante	Göteborg
Arrecife / Lanzarote	Malmö
Ibiza	Lulea
FRANCE (29 main airports)	**UNITED KINGDOM (31 main airports)**
Paris/Charles.De.Gaulle	London / Heathrow
Paris/Orly	London / Gatwick
Nice	Manchester
Lyon / Satolas	London / Stansted
Marseille	Birmingham
Toulouse	Glasgow
IRELAND (6 main airports)	London / Luton
Dublin	Edinburgh

* airports with a total volume of 100 000 passengers per year or more.
** only Brussels Airport reporting.
Source: Eurostat.

Gradual construction of the TEN boosts high-speed lines

In six Member States, dedicated high-speed railway lines have been increasingly built over the last decade. The largest part of these lines in terms of length was installed in France. With their TGV lines France offers 1 395 km or 51 % of this track type, followed by Germany with 633 km (23 %) and Spain with 377 km (14 %). The figures mentioned in Table 2.5 concern only new lines especially built for high-speed purposes and do not consider existing tracks that might have been adapted for high-speed operation. The entire high-speed network is thus substantially higher.

Within the near future many more of high-speed sections of track will be added to the European rail network. The adding of new high-speed lines to the global rail network so far has however not been able to compensate the putting out of service of other parts of the network.

Motorways more than tripled at Community level

Completely different tendencies can be observed for the development of road networks. Between 1970 and 2000 the total road network increased by 23.3 %. This global increase should however be looked at with care: apart from 'motorways', the term 'road' is subject to various definitions. Keeping this in mind, the highest growth during the period 1970–99 has been achieved in Portugal (+ 71 %), Belgium (+ 57 %), France (+ 39 %) and the Netherlands (+ 37 %). Although motorways constitute only a small part of the entire road network, their length has more than tripled (at EU-level) during the observation period (from 15 864 km in 1970 to 51 559 km in 2000). Extraordinary growth can be noticed for Greece and Spain: the Greek motorway network increased from 11 km in 1970 to 707 km in 2000. A similar development is recorded in Spain where the network increased from 387 km to 9 049 km over the same period, although differences in definition might overstate this increase.

In 2000, the most extensive motorway network within EU-15 can be found in Germany with 11 712 km, followed by France (9 766 km) and Spain (9 049 km). The Benelux countries offer the densest motorway network with values between 44.2 km/1 000 km^2 and 55.8 km/1 000km^2. The EU-15 average is 15.9 km per 1 000 km^2, a value close to those registered in Portugal and the United Kingdom.

Inland waterways: easier from North Sea to Black Sea

In the present context, navigable inland waterways are defined as 'rivers, lakes and canals, over which vessels of a carrying capacity of not less than 50 tonnes can navigate when normally loaded'. Inland waterways in the EU are nearly exclusively used for the transport of goods. Little passenger transport takes place using the inland waterway network. When it does it is mainly for leisure purposes.

Between 1970 and 2000, the total length of navigable inland waterways in the nine EU Member States able to perform transport activities using this mode decreased by 1 770 km which represents 6 %. Germany, with 6 754 km is the main contributor to today's network (23 %). Part of the network has increased in importance with the opening of the Main – Danube canal in the early 1990s, facilitating traffic to Austria and beyond (up to the Black Sea port of Constantza in Romania).

Netherlands: very long network compared to the country's size

France's waterways offer a slightly scattered network structure and experienced a 22 % decrease over the last three decades. Italy ceased to use 860 km of navigable waterways, representing a loss of 37 %. It should be noted that transport lines on the lakes in Northern Italy and in Venice represent about 40 %, and the river Po approximately 25 % of the total Italian network.

The Netherlands owns an extraordinary long navigable waterway system compared to the size of the country. Despite a loss of 10 % in usable length since 1970, the transport of goods over inland waterways continues to be an important mode, both in national and international transport (see Chapter 5.1 — Transport of goods).

Difficulties to measure airport/seaport characteristics

As a densely populated part of the world, the EU as a whole features an impressive quantity of airports. It is not easy to « measure » a country's airport network or airport characteristics. The latter could for instance be measured on the basis of the number of runways and aircraft stands (be it with contact or remote), but such type of information is not yet available at Eurostat. Instead, Table 2.7 offers, for 2001, an overview of the number of main airports in the individual Member States (i.e. with a volume of more than 100 000 passengers per year) and furthermore shows those individual airports that, together, are responsible for at least 80% of a country's total traffic (both national and international traffic).

In geographically small countries, 80% of the total traffic is often handled by a single airport (like in Belgium, Denmark, Ireland, the Netherlands and Luxembourg). Larger countries and countries featuring islands (that eventually constitute popular holiday destinations too, like Spain and Greece) often list a certain number of important airports. Indications on the volume of air cargo handled at the various European airports can be obtained in chapter 5.1 (Transport of goods).

Table 2.8: Main* ports handling at least 80% of the country's total cargo traffic in 2001

BELGIUM (4 main ports)	**ITALY (37 main ports)**
Antwerpen	Trieste
Zeebrugge	Genova
DENMARK (17 main ports)	Taranto
Fredericia (og Shell-Havnen)	Augusta
Aarhus	Venezia
Statoil-Havnen	Ravenna
Kobenhavns (Og Frihavnen)	Porto Foxi
Helsingør	Gioia Tauro
Rødby (Faergehavn)	Livorno
Esbjerg	Santa Panagia
Aalborg Portland	Milazzo
Enstedvaerkets Havn	Savona - Vado
Frederikshavn	La Spezia
GERMANY (17 main ports)	Napoli
Hamburg	Brindisi
Wilhelmshaven	**PORTUGAL (7 main ports)**
Bremerhaven	Sines
Rostock	Leixoes
Lübeck	Lisboa
Bremen	Setubal
GREECE (19 main ports)	**FINLAND (21 main ports)**
Piraeus	Skoeldvik
Eleusis	Helsinki
Thessaloniki	Kotka
Agii Theodori	Naantali
Volos	Rautaruukki/Raahe
Megara	Rauma
Aliverio	Pori
Chalkida	Hamina
Heraklion	Turku
Milos Island	Kokkola
Larymna	Kemi
SPAIN (26 main ports)	**SWEDEN (27 main ports)**
Algeciras	Göteborg
Barcelona	Brofjorden Scanraff
Tarragona	Trelleborg
Bilbao	Helsingborg
Valencia	Lulea
Cartagena	Malmo
Huelva	Stockholm
Gijón	Oxelosund
Santa Cruz de Tenerife	Karlshamn
Las Palmas, Gran Canaria	Norrkoping
La Coruña	Gavle
Palma de Mallorca	Stenungsund
Castellon de la Plana	Slite/Slite Industrihamn
FRANCE (20 main ports)	Storugns
Marseille	**UNITED KINGDOM (48 main ports)**
Le Havre	Grimsby & Immingham
Dunkerque	Tees & Hartlepool
Nantes Saint-Nazaire	London
Rouen	Forth
Calais	Southampton
IRELAND (8 main ports)	Milford Haven
Dublin	Sullom Voe
Limerick	Liverpool
Cork	Felixstowe
NETHERLANDS (10 main ports)	Dover
Rotterdam	Kirkwall
Amsterdam	Medway
	Belfast
	Clydeport
	Bristol

* Main ports are ports that handle a cargo volume of at least 1 million tonnes.
Source: Eurostat.

261 maritime ports handle over 1 million tonnes of cargo per year in 2001

The same principle has basically been applied for the seaports. Table 2.8 lists the national distribution of those of the 261 main seaports in the EU (i.e. seaports that handled at least 1 million tonnes of cargo in 2001) that together handled at least 80% of a country's total cargo volume in 2001.

Candidate countries

Bulgaria: electrified rail lines over EU-average

Among the Candidate Countries, Poland features, with 21 119 km, the most extensive railway network in 2001. Turkey, the geographically largest Candidate Country and more than double as large as Poland, has a network less than half of that: 8 671 km (see Table 2.9). When expressed in railway length per 100 000 inhabitants, it appears that all countries but Turkey are situated well over the EU average (41.4 km/100 000 inhabitants – in 2000). The picture is mixed when relating the network length to the national territory: with 120.8 km per 1 000 km² in 2001, the Czech Republic has a density more than double the EU-average (48.3 km – in 2000). High-density ratios were also calculated for Hungary and the Slovak Republic. Half of the Polish rail network is electrified, a value which corresponds to the EU-average. With 63% of electrified lines, only Bulgaria offers a higher value. The islands Cyprus and Malta do not have railways. Furthermore, Table 2.10 outlines that between 1995 and 2001, the network of Lithuania and Poland has been decreasing, whereas it remained stable in the other Candidate Countries.

Slovenia: dense motorway network

In contrast with the rail network, and with the exception of Slovenia, the motorway network of all Candidate Countries) is less developed. Neither Malta (due to its size), nor Lithuania have any motorways. With 1 851 km, Turkey features the longest network; it corresponds roughly to that of Belgium (1 702 km, in 2000). With regards to the motorway density (see last column of Table 2.9), it shows that all countries but Slovenia are far off the EU-average of 15.9 km/1 000 km².

However, Table 2.10 suggests that in most countries, the construction of motorways is progressing relatively fast. Between 1995 and 2001, the Polish network increased by 62% (from 246 km to 398 km), that of Cyprus, Estonia, the Slovak Republic and Slovenia by around 50%.

Table 2.9: Candidate Countries : length of transport networks 2001 - key indicators

	Railways[1]				Motorways		
	km	% electrified	km/100 000 inhab.	km/1 000 km²	km	km/100 000 inhab.	km/1 000 km²
Bulgaria	4 320	63	52.9	39.0	324	4.0	2.9
Cyprus	-	-	-	-	257	3.1	2.3
Czech Republic	9 523	32	92.7	120.8	517	5.0	6.6
Estonia	967	13	67.4	21.4	93	6.5	2.1
Hungary	7 679	35	75.5	82.5	448	4.5	4.8
Latvia	2 413	11	99.9	37.4	-	-	-
Lithuania	1 696	6	45.9	26.0	417	11.3	6.4
Malta	-	-	-	-	-	-	-
Poland	21 119	50	54.6	67.5	398	1.0	1.3
Romania	11 015	35	49.1	46.2	113	0.5	0.5
Slovak Republic	3 665	42	67.8	74.7	296	5.5	6.0
Slovenia	1 201	42	60.3	59.2	427	21.5	21.1
Turkey	8 671	20	13.3	11.3	1 851	2.8	2.4

(1) Railways: Data for UIC member railways. Estimates in italic.
Sources: Eurostat / ECMT / UNECE, UIC, IRF, national statistics.

eurostat

The potential of the Danube

Only eight out of thirteen Candidate Countries feature an inland waterway network, of which the Danube, running from Austria to the Black Sea through the Slovak Republic, Hungary, Bulgaria (border) and Romania constitutes an important element. With 3812 km of navigable rivers, canals and lakes, Poland has a relatively extensive network.

Often only one main airport

Table 2.11 shows the number of major airports (over 100 000 passengers per year) in the Candidate Countries. Turkey offers 14 of such airports, also due to extensive holiday traffic. In many other countries, air transport is often concentrated on one major airport, in most cases the airport of the capital city. Poland has 6 major airports, the share of Warsaw airport is however very important.

Surrounded by the Aegean, the Black, as well as the East Mediterranean Sea, Turkey counts 16 main seaports (over 1 million tonnes of cargo or over 200 000 passengers). Bulgaria's and Romania's seaports are located on the Black Sea whereas Estonia, Latvia, Lithuania and Poland have all their ports located on the Baltic Sea. Malta and Cyprus feature 3 and 2 main ports respectively. Finally, Slovenia, with a coastline of only 47 kilometres (Adriatic Sea), offers 3 ports of which only one (Koper) is over the threshold to be called a 'main port'.

Table 2.10 : Candidate Countries: length of transport networks by country (km)

Railways

Motorways

Pipelines

Inland waterways

	BG	CY	CZ	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR
1995	4 293	-	9 430	1 021	7 632	2 413	2 002	-	23 986	11 376	3 665	1 201	8 549
	314	168	414	64	335	-	394	-	246	113	198	293	1 246
	578	-	581	-	847	766	400	-	2 278	3 546	-	-	1 126
	470	-	677	320	1 373	-	369	-	3 980	1 779	172	-	-
1996	4 293	-	9 430	1 020	7 619	2 413	1 997	-	23 420	11 385	3 673	1 201	8 607
	314	194	423	66	365	-	404	-	258	113	215	310	1 405
	578	-	736	-	847	766	399	-	2 278	3 546	-	-	2 112
	470	-	677	320	1 373	-	369	-	3 812	1 779	172	-	-
1997	4 291	-	9 430	1 018	7 593	2 413	1 997	-	23 328	11 380	3 673	1 201	8 607
	314	199	485	68	381	-	410	-	264	113	219	330	1 528
	578	-	736	-	848	766	399	-	2 278	4 629	-	-	2 112
	470	-	677	320	1 373	-	369	-	3 812	1 779	172	-	-
1998	4 290	-	9 430	968	7 642	2 413	1 997	-	23 210	11 010	3 665	1 201	8 607
	319	204	499	74	448	-	417	-	268	113	292	369	1 726
	578	-	736	-	848	766	399	-	2 278	4 629	-	-	2 112
	470	-	664	320	1 373	-	369	-	3 812	1 779	172	-	-
1999	4 290	-	9 444	968	7 651	2 413	1 905	-	22 891	10 981	3 665	1 201	8 682
	324	216	499	87	448	-	417	-	317	113	295	399	1 749
	578	-	736	-	848	766	500	-	2 278	4 423	-	-	2 112
	470	-	664	320	1 373	-	369	-	3 813	1 779	172	-	-
2000	4 320	-	9 444	968	7 668	2 413	1 905	-	22 560	11 015	3 665	1 201	8 671
	324	240	499	93	448	-	417	-	358	113	296	427	1 773
	578	-	736	-	848	766	500	-	2 278	4 423	-	-	2 112
	470	-	664	320	1 373	-	380	-	3 813	1 779	172	-	-
2001	4 320	-	9 523	967	7 679	2 413	1 696	-	21 119	11 015	3 665	1 229	8 671
	328	257	499	93	448	-	417	-	398	113	296	435	1 851
	578	-	736	-	848	766	500	-	2 285	4 423	-	-	2 112
	470	-	664	320	1 373	-	436	-	3 812	1 779	172	-	-

Source: Eurostat / ECMT / UNECE.

Table 2.11: Candidate Countries: number of Commercial airports and seaports, 2001		
	Main airports (over 100000 passenger movements per year)	Main seaports (handling over 1 million tonnes of cargo or over 200000 passengers per year)
Bulgaria	3	2
Cyprus	2	2
Czech Republic	3	-
Estonia	1	5
Hungary	1	-
Latvia	1	3
Lithuania	1	1
Malta	1	3
Poland	6	5
Romania	2	2
Slovak Republic	2	-
Slovenia	1	1
Turkey	14	16

Source: Eurostat.

EFTA countries

Due to the characteristics of the country (island, very uneven population distribution), Iceland has neither motorways nor railways or oil pipelines (see Table 2.12). Natural features of the national territory also play a significant role for Norway and Switzerland: in the case of Norway, it is the uneven population distribution and the presence of many fjords that influence the construction of transport networks whereas Switzerland, a transit country par excellence, has the Alps.

Norwegian motorways: not notably more than in Luxembourg

In 1999, Norway had 144 km of motorways (concentrated around the capital Oslo), only marginally more than that of Luxembourg (114 km). Switzerland's motorways summed up 1 642 km, close to the length of the network of neighbouring Austria or that of Belgium.

Costly Swiss rail network

Special emphasis should be put on the Swiss rail network: with 3155 km its length is again similar to that of Belgium but its role in the frame of the handling of goods transport in transit (also intermodal transport) to Northern Italy and beyond is of prime importance. Evenso, the cost of building and maintaining the rail network should be underlined.

Table 2.12: EFTA countries: length of transport networks (in km)

		IS	LI	NO	CH
1998	Railways	-	18.5 [1])	4 006	3 155
	Motorways	-	-	128	1638
	Other roads	12 689	399	90 613	69 421
	Pipelines	-	-	5 747	108
	Inland waterways	-	-	-	745
1999	Railways	-	18.5 [1])	4 021	3 155
	Motorways	-	-	144	1642
	Other roads	12 955	401	90 592	67 831
	Pipelines	-	-	5 747	108
	Inland waterways	-	-	-	745

(1) Owned and operated by ÖBB (Austrian railways).
Source: Eurostat/ECMT/UNECE.

2.3 Trans-European transport networks (TENs)

The Maastricht Treaty provided the background for the development of trans-European networks (TENs) for telecommunications, energy and transport. TENs are a key element for the creation of the internal market and the reinforcement of economic and social cohesion. This development includes the interconnection and interoperability of national networks as well as the access to such networks.

This chapter outlines the main ideas and projects linked to the development of the transport TEN.

Environmentally responsible integration of national networks

A comprehensive, trans-European transport network is of prime importance for employment, competitiveness and growth. The trans-European transport network should lead to a gradual integration of national networks. A single network of a European dimension should ensure mobility of persons and goods, offer high quality infrastructures combining all modes of transport and allow optimal use of existing capacities.

From a juxtaposition of national plans to a common global vision

The first guidelines for the TEN-T network were established in 1996. These first guidelines mention the characteristics of the different networks. Periodically, the Commission evaluates progress made in setting up the network and state whether the guidelines need to be adapted.

Community measures for the rail network include:

- the gradual establishment of the network consisting of the infrastructure and fixed installations. This includes the creation of high-speed and appropriate rail freight networks as well as the maintenance or upgrading of conventional lines;
- the achievement of technical interoperability of the European high-speed train network;
- consideration of safety, reliability, human health, environmental protection, technical compatibility and operational requirements.

For the road network, measures focus on :

- the creation of missing links and in particular those on cross-frontier intra-Community axes and those that are attractive to peripheral or enclosed areas;
- improvements on existing links, especially on cross-border axes and peripheral areas;
- connections with certain non-member countries;
- inter-modal connections aimed at combined-transport axes;
- bypasses for the principal urban nodes located on the road TEN;
- the development and implementation of computerised traffic-management systems.

Measures for the inland waterway network comprise:

- the building of missing links in the existing network or the removing of bottlenecks through efficient traffic management systems;
- the notion of a multi-modal approach: complementarily with other modes through improved port infrastructures.

Measures for the sea ports network comprise:

- new port infrastructures
- improved connections with the land networks
- Transhipment facilities and multimodal connections within the port area
- Improvement of sea access to ports (navigational facilities, clearing of ice)

Measures for the airport network focus on:

- Investments for airport infrastructure such as high speed rail connections at the airports designated as 'International Connecting points' (these include airports or airport systems with a volume of over 5 million passenger movements per year or greater than 150 000 tons of freight movements)
- Investment at airports designated as 'Regional Accessibility Points' (generally airports with an annual traffic volume of 500 000 to 900 000 passengers, airports on islands or landlocked areas)

As underlined in the 2001 White Paper on transport the existing TEN-T guidelines should be adapted to take into account a worrying increase in congestion due to the persistence of bottlenecks, missing links, a lack of interoperability, and the pressing need to promote a modal rebalancing. The prospect of enlargement to include 12 new countries accentuates the need for a new approach to preserve the competitiveness of the European economy and to guarantee a balanced and sustainable development of transport. Since then, the European Councils of Göteborg, Barcelona and Brussels have repeatedly called on the Community institutions to adopt revised guidelines by 2003 and new priority projects.

A first limited revision was proposed by the Commission in October 2001 and was accepted, in its broad lines, by the European Parliament on 30 May 2002. The Commission issued a revised proposal in September 2002 to outline its positions on the Parliament's amendment but this revised proposal is still pending an agreement within the Transport Council.

Particular support for cross-border sections

Given the delays that were affecting many key priority projects; particularly in their cross-border sections, a revision of the financial rules for the TEN-T was also proposed in October 2001 with a view to heighten from 10 to 20% EU financial support to rail projects affected by difficult geographical conditions on their cross-border sections or for cross-border sections with candidate countries. The Commission issued a revised proposal in January 2003 following Parliament's agreement but this revised proposal is also still pending an agreement from the Council.

Without waiting the final adoption of these proposals, the Commission decided to initiate a second step for a more profound revision of the guidelines for the TEN-T. In order to involve the States and the European Investment Bank from the outset of this exercise for the revision of the guidelines in 2003, given the important territorial and financial impacts of major infrastructure projects, a High-Level Group (also known as the Van Miert Group) on the TEN-T was set up by the Commission. The Group issued its report on 30 June 2003.

After a careful examination of the Group's report, the Commission decided to propose on 1st October 2003, a new revision of the trans-European transport network guidelines and of the TEN-T financial rules with a view to adapt them to their new required dimension. This proposed revision complements and updates its 2001 proposals for an adaptation of the guidelines and of the TEN-T financial rules. Its aim is to concentrate resources on priority infrastructure projects and to facilitate Council and Parliament's agreement on these new proposals so that they can enter into force as soon as possible, as requested by the European Council.

These policy guidelines notably include:

- greater consideration of environmental issues
- the development of a better rail freight service network
- the encouragement of short sea and inland waterway shipping
- integration between rail and air modes
- measures concerning the implementation of intelligent transport systems.

Maps representing the TEN Outline Plans for the rail, road, inland waterways and airport network are included in this chapter.

Projects of particular importance deserve particular support

The trans-European transport network is made up of many projects of common interest. Some projects are however of particular importance for the European Union given their scale, their role in supporting transnational trade, in reinforcing the cohesion in the Union or because they help concentrating long distance traffic flows on environmentally friendly modes of transport. A particular effort of the Community to support these projects is therefore justified and necessary to ensure a coherent development of the network and to promote a common vision of its main axes towards national and regional authorities. These projects, selected according to a strict methodology included in the guidelines, are called «priority projects».

Originally fourteen transport projects of common interest were identified as priority projects during the European Council meeting in Essen in December 1994. Only three of the original projects have been completed (the upgrading of the conventional rail link: Cork – Dublin – Belfast – Larne – Stranraer (Ireland), capacity enhancements at Malpensa airport (Northern Italy) and the Öresund fixed link between Denmark and Sweden) and have been removed from the list and another five will be completed before 2010. Significant progress was made in the majority of the 6 remaining projects since important sections will be completed before 2010.

In the revisions of the TEN-T guidelines of 2003, the Commission proposes to include all projects identified in the list 1 of the High Level Group report published on 30th June and three projects which were debated within the group and for which new development since June make them to meet the criteria. These new projects therefore come as an addition to the 6 new projects and 2 new extensions proposed by the Commission in October 2001 and approved by the European Parliament in May 2002.

The Commission proposes for each of these projects a Declaration of European Interest which entails:

- A concentration of EU financial resources. A new article of the draft Decision proposes that TEN-T funds, cohesion funds, structural funds and ISPA funds (Instrument for Structural Policies for Pre-Accession) be concentrated on priority projects.
- An incitation for Member States to stick to the agreed timetable by introducing the possibility of withdrawing the project from the list in case of unjustified delays.

- Ex-post evaluations of each project to prepare the next revisions and improve project evaluation methods. These evaluations would be made available to the Commission.
- A coordinated evaluation and public consultation procedures, prior to the project's assent. In the case of certain cross-border sections like tunnels or bridges, Members will have the possibility to implement a single transnational enquiry to evaluate and consult the project.

ITS, ERMTS and especially GALILEO

The TEN will also benefit from the development and application of new transport technologies. These are generically referred to as Intelligent transport systems (ITS). These include the development of a European Rail Traffic Management System (ERTMS), which is close to completion and will improve rail safety as well as ITS for road and air sectors. Similarly strategic benefits will accrue from the development of the European Global Satellite Navigation System GALILEO which is a priority project.

Multiple-source funding

TEN projects benefit the whole of the European Union and Member States should go beyond a purely national logic, which has led, apart from a few exceptions, to their excluding funding for any infrastructure outside their territory.

The priority projects and in particular those located in areas eligible for Structural Funds and Cohesion Fund financing have benefited from substantial amounts of EU financing.

EU financing of TEN represents in most cases a small proportion of the total cost, except for some projects in the 'cohesion' countries. The greater part comes from public authorities in the Member States and sometimes the private sector.

For the Member States the financial support from the TEN-budget, the Cohesion Fund as well as loans from the European Investment Bank (EIB) are available. From 1996 to 2001, the TEN-T budget provided 2.8 billion Euro (see Table 2.13) and the Cohesion Fund contributed with an amount of 5.2 billion Euro from 1994 – 1999. EIB loans totalled 24 billion Euro between 1997 and 2001. Hence in total approximately 32 billion Euro have been provided by these sources between 1994 and 2001.

When focussing on the dedicated TEN-T budget (Table 2.13), it appears that after a strong increase from 1996 onwards, total support reached its peak in the year 2000 (590 million Euro), which was more than twice the amount spent in 1996. Between 1996 and 2001, more than half of the budget was spent on rail projects. If rail traffic management is also included, the share of rail adds up to 58% of the entire TEN-T budget. The second largest share, although substantially lower, was allocated to roads and amounted to 12% of the total. An additional 4.9% was spent on road traffic management. The road share (without traffic management) remained relatively stable.

Between 1996 and 2001, support for airports and ports amounted to 4% and 1% of the total budget respectively. Expenditure on multi-modal transport was 5.8% of the total in the same

Table 2.13: Total TEN-T support 1996-2001 per mode (in million EUR)

	1996	1997	1998	1999	2000	2001	Total 1996-2001 in million EUR	Total 1996-2001 share (%)
Rail	163.70	176.29	269.75	254.80	327.13	256.96	1 448.63	52.8
Road	27.77	49.82	59.50	62.96	71.40	68.00	339.45	12.4
Inland waterways	1.50	4.00	8.50	18.24	18.80	9.81	60.85	2.2
Airports	3.78	21.45	28.60	29.36	11.10	13.73	108.02	3.9
Ports	3.10	4.70	6.07	3.04	3.50	7.90	28.31	1.0
Combined transport	0.31	0.00	1.80	18.40	23.50	21.00	65.01	2.4
Multimodal transport	17.20	36.20	24.00	45.27	34.00	2.80	159.47	5.8
Air traffic management	18.97	18.60	21.10	12.39	14.70	10.97	96.73	3.5
Road traffic management	20.50	24.38	16.90	15.68	32.13	25.29	134.89	4.9
Rail traffic management	10.23	9.00	22.80	22.05	35.00	25.60	124.68	4.5
Global Navigation Satellite Systems	10.80	6.60	9.65	14.10	18.00	110.00	169.15	6.2
VTMIS (Vessel TM)*	2.14	0.96	5.34	1.30	0.90	0.00	10.64	0.4
TOTAL	280.00	352.00	474.01	497.59	590.16	552.07	2 745.83	100.0

* Maritime Vessel Traffic Management and Information Services.
Source: DG Energy and Transport.

Table 2.14: Total TEN-T support 1996-2001 per mode (in % of total)

	1996	1997	1998	1999	2000	2001
Rail	58.5%	50.1%	56.9%	51.2%	55.4%	46.6%
Road	9.9%	14.1%	12.6%	12.7%	12.1%	12.3%
Inland waterways	0.5%	1.1%	1.8%	3.7%	3.2%	1.8%
Airports	1.4%	6.1%	6.0%	5.9%	1.9%	2.5%
Ports	1.1%	1.3%	1.3%	0.6%	0.6%	1.4%
Combined transport	0.1%	0.0%	0.4%	3.7%	4.0%	3.8%
Multimodal transport	6.1%	10.3%	5.1%	9.1%	5.8%	0.5%
Air traffic management	6.8%	5.3%	4.5%	2.5%	2.5%	2.0%
Road traffic management	7.3%	6.9%	3.6%	3.1%	5.4%	4.6%
Rail traffic management	3.6%	2.6%	4.8%	4.4%	5.9%	4.6%
Global Navigation Satellite Systems	3.9%	1.9%	2.0%	2.8%	3.0%	19.9%
VTMIS (Vessel TM)*	0.8%	0.3%	1.1%	0.3%	0.2%	0.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* Maritime Vessel Traffic Management and Information Services.
Source: DG Energy and Transport.

period, ranging from a peak in 1997 (10%) to a modest 0.5% in 2001 (see Table 2.14). Support for the Global Navigation Satellite Systems increased substantially and amounted to 20% of the total TEN-T support in 2001, making it the second largest benificiary.

With regards to the Candidate Countries, support from the PHARE funds and the ISPA (Instrument for Structural Policies for Pre-Accession), as well as loans from the European Investment Bank contributed to the implementation of transport infrastructure

New proposed projects (as compared with the 2001 proposal) are in italics.
The indicative date of completion is in between brackets.

1. **Rail axis Berlin-Verona/Milan-Bologna-Napoli-Messina-Palermo**
   - Nürnberg-München (2006)
   - München – Kufstein (2015)
   - Kufstein-Innsbruck (2009)
   - Brenner Tunnel (2015), cross-border section
   - Verona – Napoli (2007)
   - Milano – Bologna (2006)
   - *Rail/road bridge over the Messina Strait (2015)*
2. **High Speed Rail Axis Paris-Bruxelles-Köln-Amsterdam-London**
   - Tunnel under the English Channel - London (2007)
   - Bruxelles/Brussel-Liège-Köln (2007)
   - Bruxelles/Brussel-Rotterdam-Amsterdam (2007 – incl. Rotterdam and Amsterdam TGV stations not foreseen in the initial project)
3. **High Speed Rail Axis of South-West Europe**
   - *Lisboa/Porto – Madrid (2011)*
   - Madrid-Barcelona (2005)
   - Barcelona-Figueras-Perpignan (2008)

- Perpignan – Montpellier (2015)
- Montpellier – Nîmes (2010)
- Madrid-Vitoria-Irun/Hendaye (2010)
- Irún/Hendaye – Dax, cross-border section (2010)
- *Dax – Bordeaux (2020)*
- *Bordeaux – Tours (2015)*

4. TGV East
- Paris-Baudrecourt (2007)
- Metz-Luxembourg (2007)
- Saarbrück-Mannheim (2007)

5. Betuwe Line (2007)

6. Rail Axis Lyon – Trieste/ Koper – Ljubljana – Budapest-Ukrainian border
- Lyon – St-Jean-de-Maurienne (2015)
- Mont-Cenis tunnel (2015-2017), cross-border section
- Bussoleno – Torino (2011)
- Torino-Venice (2010)
- Venice – Trieste/*Koper – Divaca (2015)*
- *Ljubljana – Budapest (2015)*

7. Motorway axis Igoumenitsa/Patra-Athina-Sofia – Budapest
- Via Egnatia (2006)
- Pathe (2008)
- *Motorway Sofia-Kulata-Greek/Bulgarian border (2010), with Promahon-Kulata as cross-border section*
- *Motorway Nadlac – Sibiu – (section towards Bucuresti and Constanta) (2007)*

8. Multimodal axis Portugal/Spain with the rest of Europe
- Rail line Coruña-Lisboa-Sines (2010)
- Rail line Lisboa-Valladolid (2010)
- Rail line Lisboa-Faro (2004)
- Motorway Lisboa-Valladolid (2010)
- Motorway Coruña- Lisboa (2003)
- Motorway Sevilla- Lisboa (completed-2001)
- Lisboa new airport (2015)

9. Rail link Cork-Dublin-Belfast-Stranraer (2001 – capacity increase decided in 2003, taken into account in project 26)

10. Malpensa airport (completed-2001)

11. Fixed link Öresund (completed-2000)

12. Rail/road axis of the NordicTriangle
- Road and rail projects in Sweden (2010 – some small sections to be completed between 2010 and 2015)
- Motorway Helsinki-Turku (2010)
- Rail link Kerava-Lahti (2006)
- Motorway Helsinki – Vaalimaa (2015)
- Rail link Helsinki-Vainikkala (Russian border) (2014)

13. Road link UK/Ireland/Benelux (2010)

14. West Coast Main Line (2007)

15. Galileo (2008)

16. Freight rail line Sines-Madrid-Paris

– New trans-pyrenean high capacity rail line (2020)
– *Rail line Sines-Badajoz (2010)*

17. Rail axis Paris – Strasbourg – Stuttgart – Wien – Bratislava
– Baudrecourt – Strasbourg – Stuttgart (2015) with the Kehl bridge as cross-border section
– Stuttgart – Ulm (2012)
– München – Salzburg (2015), cross-border section
– Salzburg – Wien (2012)
– *Wien – Bratislava (2010), cross-border section.*

18. Rhin/Meuse-Main-Danube inland waterway route
– *Rhin – Meuse (2019) with the lock of Lanay as cross-border section*
– Vilshofen – Straubing (2013)
– *Wien – Bratislava (2015) cross-border section*
– *Palkovicovo – Mohàcs (2014)*
– *Bottlenecks in Romania and Bulgaria (2011)*

19. High Speed Rail Interoperability of the Iberian Peninsula
– Madrid-Andalucia (2010)
– Nordeste (2010)
– Madrid-Levante y Mediterráneo (2010)
– Corredor Norte-Noroeste, including Vigo-Porto (2010)
– Extremadura (2010)

20. Rail axis of Fehmarn Belt
– Fixed rail/road link Fehmarn Belt (2014)
– *Railway line for access in Denmark from Öresund (2015)*
– *Railway line for access in Germany from Hannover (2015)*
– *Rail line Hannover-Hamburg/Bremen (2015)*

21. Motorways of the Sea
– *Projects concerning one of the following motorways of the sea :*
– *Motorway of the Baltic Sea (linking the Baltic Sea Member States with the Member States in Central and Western Europe) (2010)*
– *Motorway of the sea of western Europe (leading from the Iberian peninsula via the Atlantic Arc to the North Sea and the Irish Sea) (2010)*
– *Motorway of the sea of south-east Europe (connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean to include Cyprus) (2010)*
– *Motorway of the sea of south-west Europe (western Mediterranean), connecting Spain, France, Italy and including Malta, and linking with the motorway of the sea of south-east Europe (including towards the Black Sea) (2010)*

22. Rail Axis Athina – Sofia – Budapest – Wien – Praha – Nürnberg /Dresden
– *Rail line Greek/Bulgarian border-Kulata-Sofia – Vidin/Calafat (2015)*
– *Rail line Curtici – Brasov (towards Bucuresti and Constanta) (2010)*
– *Rail line Budapest – Wien (2010), cross-border section*
– *Rail line Brno – Praha – Nürnberg (2010), with Nürnberg – Praha as cross-border section.*

23. Rail axis Gdansk – Warszawa – Brno/Bratislava-Wien
– *Rail line Gdansk – Warszawa – Katowice (2015)*
– *Rail line Katowice – Brno-Breclav (2010)*
– *Line Katowice-Zilina-Nove Misto n.V. (2010)*

24. Rail axis Lyon/Genova – Basel – Duisburg – Rotterdam/Antwerp
– *Lyon – Mulhouse – Mülheim, with Mulhouse-Mülheim as cross-border section (2018)*
– *Genova – Milano/Novara-Swiss border (2013)*
– *Basel – Karlsruhe (2015)*
– *Frankfurt – Mannheim (2012)*

- *Duisburg – Emmerich (2009) (Project 5 – Betuwe line- links Rotterdam to Emmerich)*
- *Iron Rhine Rheidt – Antwerp (2010)*

25. Motorway Gdansk – Brno/Bratislava-Wıen
- *Motorway Gdansk – Katowice (2010)*
- *Motorway Katowice – Brno/Zilina (2010), cross-border section*
- *Motorway Brno – Wien (2009), cross-border section*

26. Rail/road axis Ireland/United Kingdom/Continental Europe
- *Road/rail corridor linking Dublin with the North (Belfast-Larne) and with the South (Cork) (2010)*
- *Road/rail corridor Hull-Liverpool (2015)*
- *Rail line Felixstowe – Nuneaton (2011)*
- *Rail line Crewe – Holyhead (2008)*
- *West Coast Main Line (2007)*

27. « Rail Baltica »: Rail axis Warsaw - Kaunas - Riga – Tallinn
- *Warsaw - Kaunas (2010)*
- *Kaunas - Riga (2014)*
- *Riga - Tallinn (2016)*

28. « Eurocaprail »
- *Rail axis Bruxelles-Luxembourg-Strasbourg (2012)*

29. Ionian/Adriatic intermodal corridor
- *Kozani-Kalambaka-Igoumenitsa (2012)*
- Loannina-Antirrio-Rio-Kalamata (2014)

A new mechanism to support «motorways of the sea»

A new priority project concerns the development of motorways of the sea to ensure that transnational maritime links between countries isolated for geographical reasons or affected by road congestion be treated with the same importance as land links. The objective is to concentrate freight transport for some key links on a limited number of ports to increase the viability of these links. Member States will be encouraged to jointly establish transnational maritime links in a way to avoid distortion of competition. A map of this project is visible on the next page.

PROJECT N°21

DG TREN

Trans European Transport Network
Priority Projects

MOTORWAYS OF THE SEA

Cartography: DG TREN 10/2003

1:23.000.000

0 250 500 1.000 Kilometers

Motorways of the Sea

Inland Waterways

Capitals

Borders

Other

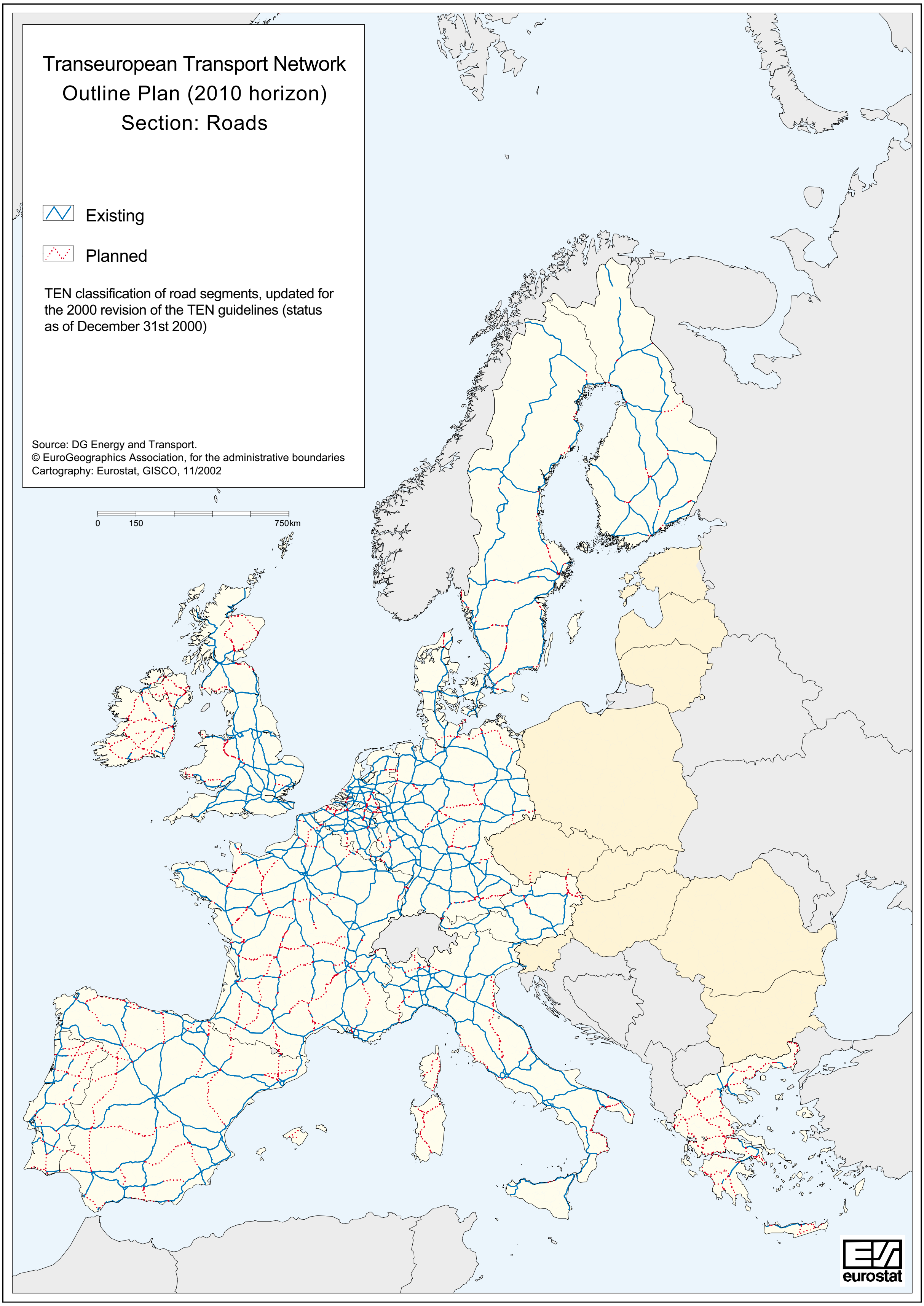
Coastline

Eu & CEC country boundary

Digital Elevation Model

High : 5587

Low : 210


Transeuropean Transport Network
Outline Plan (2010 horizon)
Section: Roads
Existing
Planned
TEN classification of road segments, updated for the 2000 revision of the TEN guidelines (status as of December 31st 2000)
Source: DG Energy and Transport.
© EuroGeographics Association, for the administrative boundaries
Cartography: Eurostat, GISCO, 11/2002
0
150
750km
eurostat

Transeuropean Transport Network
Outline Plan (2010 horizon)
Section: Railways
Conventional lines
Planned conventional lines
High speed lines
Planned high speed lines
Upgraded high speed lines
Planned upgraded high speed lines
TEN classification of railway segments, updated for the 2000 revision of the TEN guidelines
TEN type of railway segments, updated for the 2000 revision of the TEN guidelines (status as of December 31st 2000)
Source: DG Energy and Transport.
© EuroGeographics Association, for the administrative boundaries
Cartography: Eurostat, GISCO, 11/2002
0
150
750km
eurostat


Transeuropean Transport Network
Outline Plan (2010 horizon)
TEN inland waterways, version 2
Existing
Planned
Third country connections
Bottlenecks
Source: DG Energy and Transport.
© EuroGeographics Association, for the administrative boundaries
Cartography: Eurostat, GISCO, 11/2002
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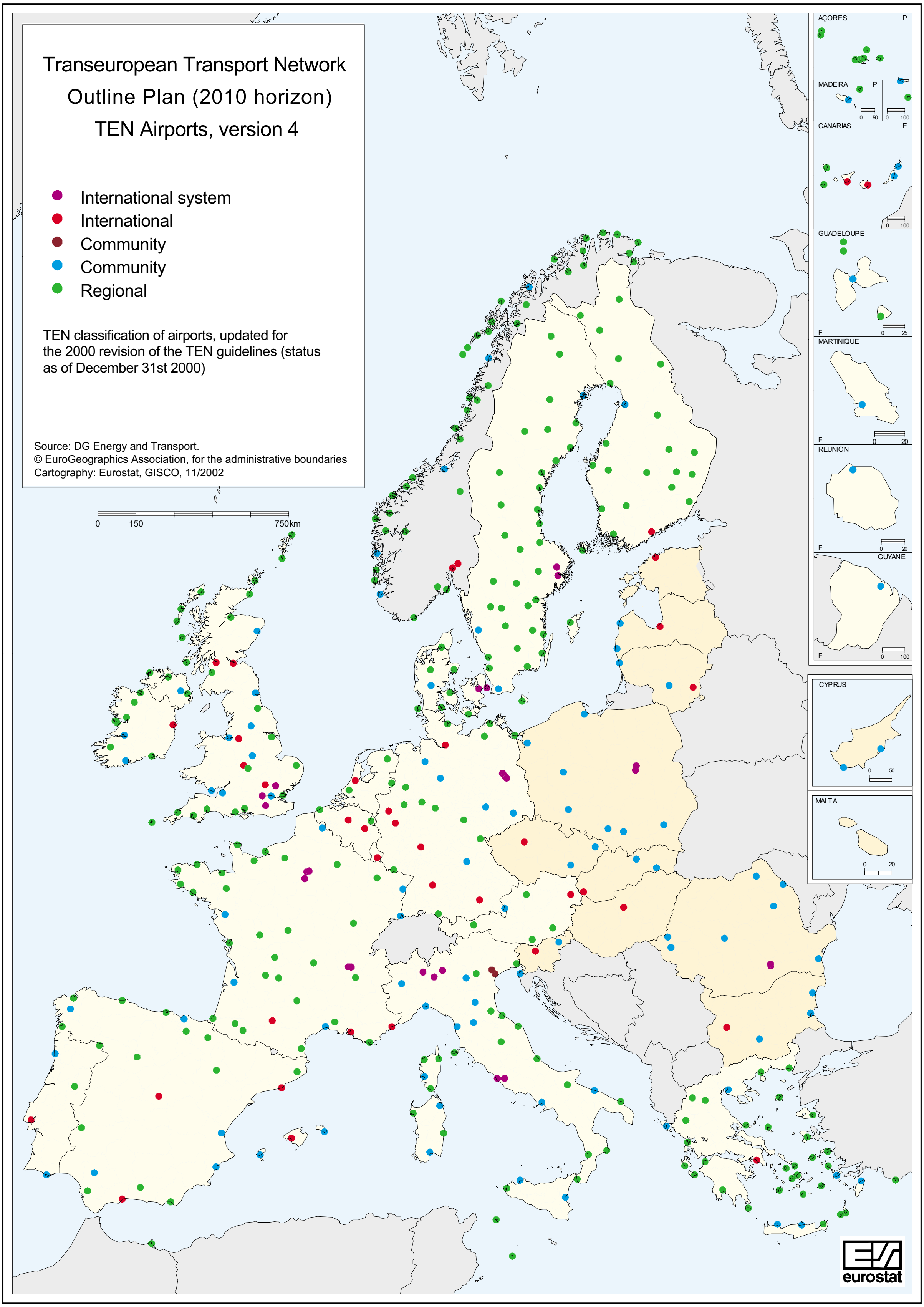
750km
eurostat


Transeuropean Transport Network
Outline Plan (2010 horizon)
TEN Airports, version 4
International system
International
Community
Community
Regional
TEN classification of airports, updated for the 2000 revision of the TEN guidelines (status as of December 31st 2000)
Source: DG Energy and Transport.
© EuroGeographics Association, for the administrative boundaries
Cartography: Eurostat, GISCO, 11/2002
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750km
AÇORES
MADEIRA
CANARIAS
GUADELOUPE
MARTINIQUE
REUNION
GUYANE
CYPRUS
MALTA
eurostat