

Panorama of transport

Statistical overview
of transport
in the European Union

Part 2

Data 1970-2001

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Luxembourg: Office for Official Publications of the European Communities, 2003

ISBN 92-894-4993-4
ISSN 1725-275X

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PANORAMA OF TRANSPORT

Statistical overview of the transport sector in the European Union

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3. Means of transport

Transport equipment can roughly be defined as all means that enable the transport of goods and/or persons; thus not only passenger cars, buses, lorries, trains (composed of locomotive and wagons), inland waterway vessels and aircraft are meant here, but also road trailers and semi-trailers, rail goods vehicles, bicycles and powered two-wheelers.

In the frame of this chapter however, only the main transport equipment related to road, rail, inland waterways and air transport will be highlighted.

Automotive industry: 10% of all EU-15 jobs

The European transport equipment industry is of considerable importance, both for intra- and extra-European trade: the automotive industry alone accounts for roughly 10 % of the total industrial value added. It is estimated that one out of every 10 EU-15 jobs is directly or indirectly linked to the automotive industries, and although the market for passenger cars and goods vehicles is sensitive to economic fluctuations, this industrial branch has kept its importance within the EU-15 economy.

New challenges for train manufacturers

By its excellent reputation with regard to know-how and applied technologies, the rail equipment industry scores very well in extra-EU export too.

With the privatisation process of formerly State-owned railway enterprises and the gradual introduction of European-wide high-speed train connections (see also Chapter 2.3 — Trans-European transport networks), the rail equipment industry faces new challenges.

Massive cuts in rail stock overstated

When considering the EU data relating to rail transport in Table 3.1, the considerable change in rail transport becomes obvious: at EU-15 level, all three categories (locomotives, 'rail passenger vehicles' and 'rail goods wagons' show a significant drop in numbers. More recently, the figure for goods rail wagons shows a further reduction of 2.9% between 1999 and 2000 (based on reported figures for 14 Member States, the UK figure for 2000 not being available).

Table 3.2 details that all Member States experienced very serious cuts in their stock of rail goods vehicles. In the entire EU, roughly one million goods wagons were taken out of service between 1970 and 2000. Without doubt, this is due to the increasing phasing out of old material. Another element that plays here is the tendency to outsource or lease rail equipment, mainly against the background of the railway privatisation process. Since figures mostly refer to material owned by railway companies, leased or otherwise outsourced rolling stock sometimes does not appear in the statistics anymore. Furthermore, it should be noted that double counting can occur with railcars, both included in the 'locomotives and railcars' category and the 'passenger transport vehicles' category. The figures should thus be read with care.

Along with a higher share of electrified tracks, the stock of locomotives (defined as railway vehicles equipped with a prime mover and motor or with a motor only used for hauling railway vehicles) changed: in 1970, one third of EU-15 locomotives were powered by electricity; in 1998 this figure stood at 52 %. A general decline of the total

Table 3.1: Means of inland transport - key indicators EU-15

	1970	1980	1990	1995	1998	1999	2000
Road	Passenger cars (million)	62.48	103.21	143.27	160.00	169.03	177.39
	Buses and coaches (1 000)	331	444	484	486	510	535
	Goods vehicles ¹ (1 000)	7 460	10 642	17 399	19 795	21 998	23 671
	Trailers and semi-trailers (1 000)	1 748	3 365	6 409	6 682	:	:
Rail	Locomotives and railcars (units)	49 969	46 639	44 524	40 042	38 787	39 280
	Passenger transport vehicles ² (units)	97 561	95 735	84 386	79 046	76 507	76 185
	Goods transport wagons ³ (1 000)	1 509	1 218	888	627	522	517
IWW	Self-propelled goods vessels ⁴ (units)	30 483	21 714	17 795	16 006	15 038	14 892

(1) Lorries and tractors.

(2) Coaches, railcars and trailers.

(3) Data relate to main railway companies (UIC members).

(4) Including tugs and pushers.

Sources: Eurostat, IRF, UIC, national statistics.

Estimates in italic.

Table 3.2: Rail transport equipment

Locomotives and railcars (units)							
	1970	1980	1990	1995	1998	1999	2000
Belgium	1 536	1 740	1 727	1 579	1 595	1 621	1 670
Denmark	480	461	524	507	438	433	415
Germany	18 071	18 949	15 507	13 369	12 714	12 509	13 731
Greece	514	313	400	430	638	244	244
Spain	1 928	1 791	1 922	1 856	1 730	1 670	1 693
France	6 261	6 204	7 279	7 009	6 952	7 129	7 158
Ireland	307	192	166	171	158	172	172
Italy	4 715	4 916	4 818	4 660	4 454	4 623	4 697
Luxembourg	95	85	97	110	104	113	124
Netherlands	2 140	2 174	2 372	2 345	2 240	2 170	1 965
Austria	1 501	1 451	1 553	1 573	1 552	1 551	1 500
Portugal	626	583	530	633	618	624	589
Finland	877	752	669	761	746	742	735
Sweden	1 408	1 576	1 350	1 039	948	929	887
United Kingdom	9 510	5 452	5 610	4 000	3 900	3 800	3 700
EU-15	49 969	46 639	44 524	40 042	38 787	38 330	39 280
Index 1970 = 100	100	93	89	80	78	77	79

Goods transport rail wagons (1 000)							
	1970	1980	1990	1995	1998	1999	2000
Belgium	48.9	43.4	30.3	20.3	19.1	18.6	18.8
Denmark	10.3	8.3	4.6	4.1	3.2	2.5	2.2
Germany	459.0	476.4	419.7	256.0	201.3	191.7	190.4
Greece	9.0	10.9	11.0	11.1	2.7	3.5	3.5
Spain	41.0	41.0	37.2	29.7	26.5	26.5	26.5
France	302.4	253.1	162.0	131.9	117.2	96.3	94.8
Ireland	9.5	4.7	1.8	1.8	1.8	1.6	1.9
Italy	125.9	113.4	99.7	89.1	76.0	76.2	65.0
Luxembourg	4.2	3.7	2.7	2.4	2.3	2.3	2.4
Netherlands	19.2	12.3	6.7	6.0	4.6	4.6	4.7
Austria	35.5	35.4	30.5	21.8	18.6	18.1	18.4
Portugal	9.0	6.7	4.6	3.9	4.6	4.2	3.9
Finland	21.9	21.5	15.2	14.0	13.1	12	11.8
Sweden	48.2	45.9	27.5	20.2	17.2	17.6	17.6
United Kingdom	364.9	141.2	34.4	14.2	14.0	41.0	:
EU-15	1 509	1 218	888	627	522	517	:
Index 1970 = 100	100	81	59	42	35	34	:

Passenger transport vehicles (coaches, railcars and trailers) (units)							
	1970	1980	1990	1995	1998	1999	2000
Belgium	3 415	3 609	3 286	3 110	3 415	3 397	3 494
Denmark	1 526	1 613	1 594	1 688	924	929	918
Germany	31 506	29 118	22 477	18 702	18 612	19 676	19 773
Greece	574	660	810	869	462	475	475
Spain	3 904	3 721	3 839	4 230	3 947	3 771	3 765
France	15 663	16 032	15 748	15 799	15 739	15 762	15 656
Ireland	484	348	314	318	341	359	421
Italy	11 060	13 444	14 025	13 527	12 218	12 014	11 914
Luxembourg	114	102	114	146	146	146	149
Netherlands	1 919	1 958	2 268	2 611	2 705	2 776	2 742
Austria	3 960	3 853	3 461	3 436	3 583	3 571	3 422
Portugal	980	1 137	1 232	1 341	1 406	1 431	1 303
Finland	1 032	1 100	957	977	964	981	1 003
Sweden	2 746	1 998	1 747	1 655	1 595	1 542	1 000
United Kingdom	18 678	17 042	12 514	10 637	10 450	10 300	10 150
EU-15	97 561	95 735	84 386	79 046	76 507	77 130	76 185
Index 1970 = 100	100	98	86	81	78	79	78

NB: Figures relate to UIC member companies only. 1970 and 1980 figures for Germany include equipment from former GDR.
Sources: Eurostat, UIC, UN-ECE, national statistics.

Estimates in italic.

number of locomotives and railcars is recorded: whereas the total number decreased by 11 % in the period 1970 to 1995, a sharp drop in numbers is registered in the second half of the 1990s in nearly all Member States.

The number of locomotives and railcars is estimated to have declined by 21% at EU level between 1970 and 2000. The largest reduction in stock compared to 1970 was registered in the United Kingdom (- 60 %, based on estimates), followed by Greece (- 52%) and Ireland (- 44 %). However, a part of the decrease in the last few years could be attributed to the aforementioned outsourcing of equipment (especially in the case of the United Kingdom where the entire rail transport has been privatised).

In the same period, the number of rail passenger transport vehicles of the EU-15 area have declined at the same rate (- 22 %), but with substantial differences between Member States.

The number of passenger transport vehicles increased in five Member States, with the strongest increase registered in the Netherlands (+ 43 %) and Portugal (+ 33 %). The total number of rail passenger transport vehicles taken off the tracks between 1970 and 2000 corresponds to the 2000 stock of these vehicles in the Benelux countries and France together.

It should be noted that in 2000, the total number of rail passenger transport vehicles at EU-15 level has slightly decreased again (- 1.2%) following a 1% increase between 1998 and 1999.

EU-15: 469 passenger cars per 1000 inhabitants

The constantly growing demand for personal mobility has mostly been met by an important increase in the number of passenger cars; increased demand for goods transport mainly by an important growth in the number of lorries, road tractors, trailers and semi-trailers.

In 2000, 177 million passenger cars were registered for use on EU-15 roads, an impressive 184 % growth in three decades (annual average growth rate: 3.5 %).

Graph 3.3 gives an overview of the development of the level of motorisation in the EU, the United States and the central European countries. Car density in the EU doubled in the last 25 years and reached 469 units per 1 000 inhabitants in 2000, 9 units more than a year before..

Unsurprisingly, average annual growth rates between 1970 and 2000 of the number of cars registered in a country were highest in Greece (+ 9.2 %), Portugal (+ 7.3 %) and Spain (+ 6.9 %). The lowest rates were registered for Denmark (+ 1.8 %) and Sweden (+ 1.9 %). In 2000, the three Member States with the highest car-density were Luxembourg, Italy and Germany (with 616, 563 and 522 cars per 1 000 inhabitants respectively). However, none of these countries reaches the US figure (approximately 750 cars per 1000 inhabitants in 2000). The latter figure takes into account not only the category 'passenger cars' but also the impressive number of pick-up trucks, light vans and 'sports utility vehicles' (SUV's), very often used for private transportation (like passenger cars). The vehicle register might however consider those type of vehicles as a statistical subcategory of 'commercial vehicles'.

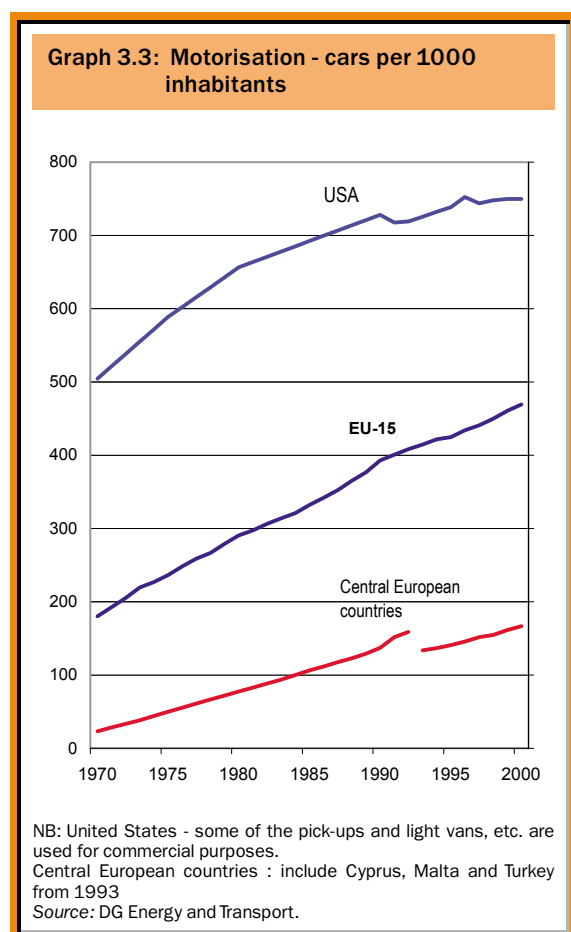


Table 3.4: Road transport equipment

Passenger cars (million)									Cars per 1 000 inhab. 2000
	1970	1980	1990	1995	1998	1999	2000		
Belgium	2.06	3.16	3.86	4.27	4.49	4.58	4.68	458	
Denmark	1.08	1.39	1.59	1.67	1.82	1.84	1.85	347	
Germany	15.11	25.87	35.50	40.40	41.67	42.32	42.84	522	
Greece	0.23	0.86	1.74	2.20	2.68	2.90	3.20	304	
Spain	2.38	7.56	12.00	14.21	16.05	16.85	17.45	442	
France	11.90	18.40	23.60	25.10	26.81	27.48	28.06	463	
Ireland	0.39	0.73	0.80	0.99	1.20	1.27	1.32	349	
Italy	10.18	17.69	27.42	31.70	31.37	32.04	32.45	563	
Luxembourg	0.07	0.13	0.18	0.23	0.24	0.26	0.27	616	
Netherlands	2.56	4.55	5.51	5.63	5.90	6.34	6.54	411	
Austria	1.20	2.25	2.99	3.59	3.89	4.01	4.10	506	
Portugal	0.42	0.92	1.85	2.56	3.20	3.30	3.50	350	
Finland	0.71	1.23	1.94	1.90	2.02	2.08	2.13	412	
Sweden	2.29	2.88	3.60	3.63	3.79	3.89	4.00	452	
United Kingdom	11.90	15.60	20.70	21.90	23.90	24.60	25.00	419	
EU-15	62.48	103.21	143.27	160.00	169.03	173.76	177.39	469	
Index 1970 = 100	100	165	229	256	271	278	284		

Buses and coaches (1 000)									
	1970	1980	1990	1995	1998	1999	2000		
Belgium	16.2	19.6	15.6	14.6	14.6	14.7	14.7	14.7	14.7
Denmark	5.0	7.4	8.1	13.5	13.9	13.9	14.0	14.0	14.0
Germany	63.9	95.8	100.4	86.3	83.3	84.7	86.6	86.6	86.6
Greece	10.5	18.0	21.4	24.6	26.3	26.8	27.0	27.0	27.0
Spain	30.7	42.6	45.8	47.4	51.8	53.5	54.7	54.7	54.7
France	41.0	65.0	75.0	80.0	82.0	85.6	85.7	85.7	85.7
Ireland	2.0	2.7	4.0	5.3	6.1	6.6	7.0	7.0	7.0
Italy	32.9	58.1	77.7	75.0	84.8	85.7	88.0	88.0	88.0
Luxembourg	0.6	0.6	0.8	0.8	0.9	1.0	1.1	1.1	1.1
Netherlands	9.5	11.2	12.1	11.5	10.8	11.2	11.4	11.4	11.4
Austria	6.7	9.0	9.4	9.8	9.7	9.8	9.9	9.9	9.9
Portugal	5.9	8.5	12.1	15.0	17.0	18.5	19.8	19.8	19.8
Finland	8.1	9.0	9.3	8.1	9.0	9.5	9.9	9.9	9.9
Sweden	14.3	12.8	14.6	14.6	14.8	14.8	14.4	14.4	14.4
United Kingdom ¹	84.2	83.3	78.0	80.0	85.1	89.0	91.2	91.2	91.2
EU-15	331	444	484	486	510	525	535	535	535
Index 1970 = 100	100	134	146	147	154	158	162	162	162

Goods vehicles ² (1 000)								
	1970	1980	1990	1995	1998	1999	2000	
Belgium	212	268	343	402	453	480	503	503
Denmark	245	249	287	333	347	362	373	373
Germany	1 188	1 511	1 653	2 215	2 371	2 466	2 527	2 527
Greece	105	401	743	871	974	1 010	1 043	1 043
Spain	710	1 338	2 333	2 937	3 393	3 605	3 780	3 780
France	1 504	2 457	4 670	4 926	5 214	5 320	5 456	5 456
Ireland	49	65	143	142	171	189	206	206
Italy	877	1 338	2 349	2 709	3 171	3 221	3 298	3 298
Luxembourg	9	9	11	16	18	19	20	20
Netherlands	286	314	553	654	795	872	939	939
Austria	121	184	253	290	310	319	327	327
Portugal	157	350	781	1 175	1 436	1 541	1 658	1 658
Finland	103	149	264	252	281	294	304	304
Sweden	145	182	310	308	338	354	374	374
United Kingdom	1 749	1 828	2 706	2 565	2 726	2 803	2 861	2 861
EU-15	7 460	10 642	17 399	19 795	21 998	22 855	23 671	23 671
Index 1970 = 100	100	143	233	265	295	306	317	317

Number of trailers and semi-trailers ³ (1 000)								
	1970	1980	1990	1995	1998	1999	2000	
Belgium	25	51	95	126	:	:	:	:
Denmark	35	128	318	409	497	526	555	555
Germany	1 070	1 905	3 565	3 029	3 371	3 502	3 632	3 632
Greece	2	5	9	12	13	:	:	:
Spain	18	48	106	157	201	221	243	243
France	81	156	165	179	311.4	320.4	329.4	329.4
Ireland	9	12	19	17	:	:	:	:
Italy	104	264	600	765	815	800	812	812
Luxembourg	6	12	9	6	:	:	:	:
Netherlands	33	68	140	190	:	:	:	:
Austria	79	165	296	384	446	465	480	480
Portugal	31	72	160	279	317	333	348	348
Finland	10	23	345	418	477	500	523	523
Sweden	85	252	348	476	502	515	533	533
United Kingdom ⁵	160	204	234	235	238	238	238	238
EU-15	1 748	3 365	6 409	6 682	:	:	:	:
Index 1970=100	100	192	367	382	:	:	:	:

(1) Data refer to Great Britain only.

(2) Difference in definition between countries: some countries include vans - therefore limited comparability.

(3) Difference in definition between countries: data for some countries include small trailers - therefore limited comparability.

(4) Methodology change: Until 1997, includes vehicles < 10 years only; after 1998, includes vehicles < 20 years only.

(5) Includes semi-trailers only

Sources: DG Energy and Transport, Eurostat/ECMT/UNECE, IRF, national statistics.

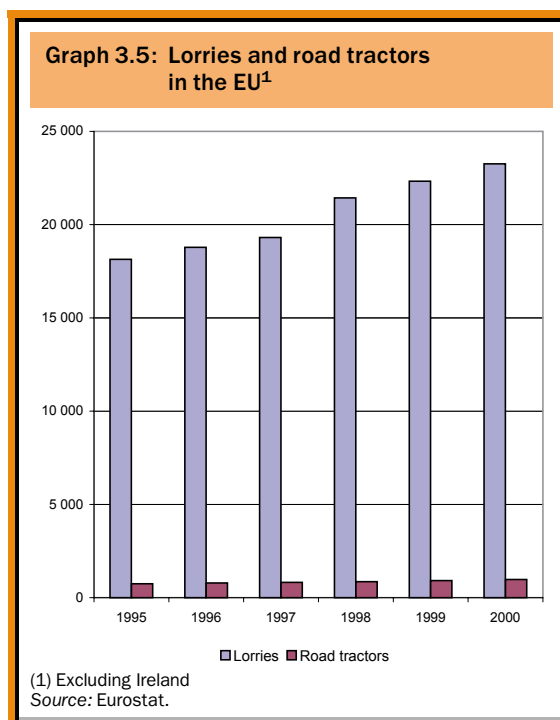
Estimates in italic.

The stock of buses and coaches expectedly progressed less than private cars. Nonetheless, a 62 % increase at EU-15 level was registered for the 1970–2000 period. Mainly the first decade of the period under observation saw impressive developments. At country level, between 1970 and 2000, only Belgium registered a negative development (– 9 %). Quite to the contrary, spectacular increases could be noticed for Ireland (+ 228 %), Portugal (+ 215 %) and Denmark (+ 175 %). Sweden is the only country which saw its stock of buses decreasing in 2000 compared to 1999 (- 3%). It should be noted that these figures include buses used in urban public transport.

Vehicle registers not completely harmonised

As could be expected when considering the strong increase of road goods transport, the number of goods road vehicles has experienced a substantial increase over the last three decades: more than triple the number of 1970. Goods road vehicles as mentioned in Table 3.4 include lorries, road tractors (only capable of goods haulage when a semi-trailer is attached) and sometimes vans and pick-ups. The fact that certain countries include vans and pick-ups or classify them in the ‘passenger cars’ category makes comparison between Member States somewhat problematic.

This aspect plays when looking at Graph 3.5: it appears to be remarkable that the number of road tractors is that low. Only 4 % of all goods road vehicles in EU-15 (excluding Ireland) consist of road tractors: a figure that does not match the picture one has in mind while on the road. The reason can be found in the fact that approximately 70 % of the goods vehicles have a carrying capacity of ‘less than 1.5 tonnes’: this



class corresponds to relatively small ‘light duty’ vehicles (often vans), leaving a much less ‘obstructive’ impression on the road.

Semi-trailers of interest in combined transport

Road tractors alone will not carry goods: semi-trailers will be attached to them. The number and size of semi-trailers gets more attention when considering their potential in combined (road – rail) transport.

Table 3.6: Inland waterway transport equipment

	Self-propelled goods vessels, tugs and pushers (units)							Dumb and pushed barges (units)						
	1970	1980	1990	1995	1998	1999	2000	1970	1980	1990	1995	1998	1999	2000
Belgium	5 092	3 107	1 871	1 608	1 250	1 236	:	455	190	167	173	153	149	:
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany ¹	6 038	4 464	3 230	3 637	3 294	3 142	:	2 200	1 732	1 566	1 290	1 230	1 197	:
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	5 790	4 254	2 514	1 687	1 443	1 408	1 389	1 591	1 211	768	749	695	679	681
Ireland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	3 124	2 347	2 755	3 069	3 184	3 197	3 196	393	217	372	431	474	437	434
Luxembourg	17	18	25	44	45	45	45	-	-	-	-	-	-	-
Netherlands	9 885	6 966	6 834	5 511	5 366	5 398	5 523	:	:	3 783	3 440	3 020	2 913	2 862
Austria	57	64	61	41	44	51	51	225	150	171	126	141	146	139
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland ²	90	113	109	132	135	138	138	70	57	23	19	28	27	30
Sweden	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	390	381	396	277	277	277	277	1 610	1 228	411	361	361	361	361
EU-15	30 483	21 714	17 795	16 006	15 038	14 892	:	6 544	4 785	7 261	6 589	6 102	5 909	:
Index 1970=100	100	71	58	53	49	49	:	100	73	111	101	93	90	:

(1) Including former GDR for 1970–90 data.

(2) Including passenger vessels.

Source: Eurostat/ECMT/UNECE.

Table 3.7: EU-15 Airfleet¹ by operator country - Number of aircraft types in service, 1st quarter of year

Aircraft type / usage	Belgium		Denmark ²		Germany		Greece		Spain		France		Ireland		Italy		
	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	
Business / Corporate / Executive	14	18	33	45	180	215	9	12	42	47	94	93	6	12	81	96	
Freight / Cargo less than 100 000 lbs MTOW	10	11	2	2	31	21	3	2	42	40	7	8	-	1	14	10	
Freight / Cargo more than 100 000 lbs MTOW	40	33	14	7	23	21	-	1	10	11	18	17	10	9	4	3	
Utility transport / Multi-Role / Convertible	1	1	7	9	12	15	-	-	14	13	22	26	-	-	-	-	
Hospital / Ambulance / other special purpose	1	1	2	2	17	15	-	-	5	10	35	35	2	1	4	6	
Passenger 50 seats or less	12	11	44	38	127	137	18	21	40	33	169	132	8	7	70	55	
Passenger 51 to 150 seats	76	43	56	58	212	224	50	38	148	149	133	145	53	50	122	136	
Passenger 151 to 250 seats	25	16	17	24	176	181	9	7	138	129	128	98	24	45	111	123	
Passenger 251 seats and more	14	7	7	10	83	81	7	8	23	14	77	83	7	7	27	24	
Total aircraft	193	141	182	195	861	910	96	89	462	446	683	637	110	132	433	453	
Aircraft type / usage	Luxembourg		Netherlands		Austria		Portugal		Finland		Sweden ²		United Kingd.		EU-15		change
	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003	2000-2003
Business / Corporate / Executive	12	26	20	20	43	56	29	40	11	10	34	30	159	162	767	882	15.0%
Freight / Cargo less than 100 000 lbs MTOW	-	-	4	4	1	1	2	-	-	-	13	18	30	36	159	154	-3.1%
Freight / Cargo more than 100 000 lbs MTOW	17	12	10	7	3	2	-	-	-	-	-	-	37	32	186	155	-16.7%
Utility transport / Multi-Role / Convertible	2	-	6	4	2	1	1	3	1	1	12	9	26	23	106	105	-0.9%
Hospital / Ambulance / other special purpose	-	-	3	2	5	4	1	-	2	3	6	2	40	35	123	116	-5.7%
Passenger 50 seats or less	16	12	41	31	38	40	12	19	7	5	61	55	145	140	808	736	-8.9%
Passenger 51 to 150 seats	2	3	59	51	34	35	31	29	45	47	21	40	278	311	1320	1359	3.0%
Passenger 151 to 250 seats	3	2	40	53	15	15	16	25	15	14	10	12	190	188	917	932	1.6%
Passenger 251 seats and more	-	-	48	46	10	14	7	8	4	5	4	3	186	141	504	451	-10.5%
Total aircraft	52	55	231	218	151	168	99	124	85	85	161	169	1091	1068	4890	4890	0%

(1) All military aircrafts excluded.

(2) Includes those SAS passenger aircraft registered in Denmark and Sweden respectively, for which the operator country is 'multinational'.

Source: Airclaims CASE2 database.

The vehicle registers of the Member States are not all able to give a complete breakdown of the various trailer categories; however the number of trailers and semi-trailers registered in the nine countries for which data were available in 2000 increased by 21.5 % between 1995 and 2000.

Table 3.4 also offers an overview of the number of trailers (coupled to lorries) and semi-trailers together. In 2000, their number nearly amounted to 8 millions at EU-level. Depending on the vehicle registers in the various countries, light trailers with a load capacity of 'up to 4 999 kg' often have a substantial share. They may notably include very light trailers, often registered for private use.

Remarkable efficiency increase for inland waterway transport

In 1999, EU-15 only offered less than half the amount of vessels than it did in 1970 (see Table 3.6). Various scrapping schemes in individual Member States have contributed to this important decrease. Nevertheless, the 1999 fleet offered roughly the same transport performance than in 1970. The improvement of transport efficiency in this domain is thus quite remarkable.

While the number of vessels increased in Italy, Luxembourg and Finland, the fleet decreased sharply in most of the other Member States offering substantial goods transport on navigable inland waterways in 2000. At EU level, more than 15 000 vessels have been taken off the transport market since 1970. Vessels concerned were often of the smaller category, unable to operate economically (often in the frame of national 'scrapping schemes').

Highest reductions in the number of vessels could be observed for Belgium and France (- 76 %), as well as for Germany (- 48 %) between 1970 and 1999.

Compared to the vessels' category, the number of dumb and pushed barges has experienced only a slight drop between 1970 and 1999 (-10%); on the basis of available figures, only a slight decrease in units can be noticed in recent years.

Passenger aircraft with 51 to 150 seats clearly dominate the fleet

Table 3.7 offers an overview of the civil aircraft fleet in the various Member States for 2000 and 2003. The information presented shows the fleet 'by operating country'. Nearly all aircraft operated

in the country are also registered in that country, some of them could however carry a foreign registration. This is, for instance, the case if aircraft are temporary leased out to a different company. More than 70% of the entire fleet consist of passenger aircraft. Aircraft with a seating capacity of 51 to 150 clearly dominate the EU-15 fleet (nearly 39% of all EU-15 civil passenger aircraft in 2003 and 28 % of the entire fleet).

More than 17 % of all aircraft are so-called business or executive aircraft (882 units at EU-15 level in 2003, 15% more than in 2000). This category includes privately or company-owned planes but also airtaxis. The vast majority of these planes have a capacity of less than 20 seats. The 'special purpose/ambulance' category (116 units in 2003) includes aircraft used for training, geo-survey and mapping, weather and atmospheric survey as well as surveillance and patrol.

It should be noted that 'combi-aircraft' (defined as 'passenger aircraft with enhanced capabilities for the carriage of freight on the passenger deck') have been included in the passenger aircraft categories according to their seat capacity.

'Quick-change convertible (passenger/ cargo)' aircraft are designed to allow a quick change of configuration from passenger to cargo and vice versa. Although their number is limited, one should be aware that this category includes both small (with a seat capacity of 10 to 20 passengers) and large aircraft (like a Boeing 747

with more than 500 seats). Such aircraft types are often used for night-time postal flights and day-time passengers flights.

Over 300 cargo aircraft in service in EU-15

6.3% of the entire fleet at EU-15 level (309 units in 2003) consists of dedicated cargo aircraft. Table 3.7 details two categories: up to 100 000 lbs. (= 45 359 kg) of maximum take-off weight (MTOW) and over 100 000 lbs. MTOW. The cargo version of a propeller driven Fokker F27 for instance has a MTOW of 45 000 lbs., an Airbus A300 (version B4-100F) 348 000 lbs. and a Boeing 747 (version 400F) 875 000 lbs.

«September 11th effect» less than expected

Following the September 11th 2001 disaster, one could expect a noticeable reduction of the aircraft fleet. Compared to 2000, the global aircraft fleet at EU-15 level remains however exactly the same. The business aircraft category saw its share in the fleet increase by 15% compared to 2000 (882 units versus 767 units in 2000). Freight/ cargo aircraft of the larger category (over 100 000 lbs. of MTOW) experienced a significant drop in numbers (-10% compared to 2000) although this might also be due to the enforcement of new noise emissions standards, banning certain aircraft-types from EU airports. In general, the average age of freight/cargo aircraft is significantly higher than those of passenger aircraft; thus older models, not meeting the

Table 3.8: EU Merchant Fleet - ships of 1000 grt and over (at 1 Jan. 2001)

	Total fleet controlled		National flag		Foreign flag		Share of foreign flag in total fleet	
	Number of ships	million dwt	Number of ships	million dwt	Number of ships	million dwt	Number of ships (%)	million dwt (%)
Belgium	117	5.85	1	0.00	116	5.85	99%	100%
Denmark ¹	639	17.89	347	7.72	292	10.17	46%	57%
Germany	2 056	32.52	449	7.70	1 607	24.82	78%	76%
Greece	3 225	142.16	764	42.32	2 461	99.84	76%	70%
Spain	230	3.68	127	1.67	103	2.01	45%	55%
France	201	5.41	120	3.32	81	2.08	40%	39%
Ireland	35	0.14	24	0.11	11	0.03	31%	23%
Italy	572	12.72	448	8.50	124	4.22	22%	33%
Luxembourg	2	0.01	2	0.01	-	-	0%	0%
Netherlands	631	5.15	473	3.04	158	2.11	25%	41%
Austria	40	0.80	23	0.12	17	0.68	43%	86%
Portugal	54	1.19	38	0.46	16	0.73	30%	61%
Finland	127	1.76	96	0.97	31	0.79	24%	45%
Sweden	344	10.27	160	1.50	184	8.77	53%	85%
United Kingdom	612	17.72	244	7.31	368	10.41	60%	59%
EU-15 (as at 1.1.2001)	8 885	257.26	3 316	84.76	5 569	172.50	63%	67%
EU-15 (as at 1.1.2000)	8 703	247.36	3 282	79.79	5 421	167.65	62%	68%
EU-15 (as at 1.1.1999)	8 326	242.00	3 350	81.40	4 976	160.60	60%	66%

(1) including international registers like the Danish International Ship register; including vessels registered at territorial dependencies.
Source: ISL merchant fleet data bases; aggregates based on quarterly updates from the Lloyd's Maritime Information System.

recent 'Chapter 3' noise certification in force since the first of April 2002, have disappeared from the fleet (see also Chapter 7.3 Emissions).

Some negative effects are however noticeable when looking exclusively at the passenger aircraft: the fleet experienced a 2% decrease at EU level, passing from 3 549 units in 2000 to 3 478 in 2003 (the large capacity aircraft being affected most). However, compared to mid-2002, the passenger aircraft fleet in service increased slightly again (+0.9%). The results are however biased by Belgium (-39%), which experienced the bankruptcy of a major air carrier. If Belgian data were excluded from the EU-total, the general decrease in the number of passenger aircraft between 2000 and 2003 would be established at 0.6%.

'Flags of convenience': an economic choice

Maritime transport plays a substantial role in the overall transport scene: in 2001, around 3 000 million tonnes were handled in EU ports (see chapter 5.1.1) and nearly 330 million passengers passed through ports' passenger terminals (see chapter 5.2.1.). However, while the Merchant fleet of the European Union handles much of this traffic, a substantial proportion is carried by vessels operated by or registered in non-EU countries.

Table 3.8 gives an overview of the EU Merchant fleet at the beginning of 2001, both for the EU as a whole and for individual Member States. The first pair of rows shows the total number of vessels and their respective dead weight tonnage (dwt) controlled by Member States. 'Controlled' means that the owner or operator of a vessel is registered in an EU country and controls its day-to-day operations. The vessel itself need not also be registered in the country of the owner or operator's registration nor even in another Member State. To illustrate this, the second pair of rows in Table 3.8 shows the number of vessels (and their respective dwt) actually registered in the owner/operator's own country of registration. The majority of the vessels (63% for the EU as a whole) sail however under a foreign flag (see the third pair of rows). These are often so-called «flags of convenience». The regulations governing a ship's management depends on the legal, safety, technological, taxation and social provisions of the Register in which it is registered. Some countries have 'international' or 'open' registers, where the requirements are different from those in the «national» register. An operator's choice of register will largely be governed by economic considerations and account for the substantial variation in the share of foreign flagged vessels (ranging from 22% in Italy to 99% in Belgium – see the last pair of rows).

Candidate Countries

Motorisation rate increases particularly fast

Table 3.9 displays selected items of the road transport equipment of the Candidate Countries: with regards to passenger cars, it appears that all countries display a rise in numbers since 1995. The number of passenger cars on the road increased particularly fast in Latvia, Lithuania, Romania and Turkey. Relatively low increases were registered in Estonia and Malta. With 497 cars per 1000 inhabitants in 2001, latter country displays the highest vehicle density in the Candidate Countries, well above the EU-15 average (469 cars in 2000). Slovenia follows with 444 cars per 1000 inhabitants. Despite the aforementioned considerable increase in the number of vehicles, Turkey's passenger car density is lowest with 66 cars per 1000 inhabitants, seven times less than the EU average.

Two-thirds of the EU-15 bus fleet for Turkey alone

Conversely, with nearly 360 000 vehicles registered, Turkey has an impressive stock of buses and coaches: this number represents around two-thirds of the entire bus fleet of the EU.

Between 1995 and 2001, the fleet increased by 36%, the highest rate among the Candidate Countries. Along with a rapidly increased motorisation rate, 8 out of 13 countries have however experienced serious cuts in their bus and coach stock during that observation period. The highest decrease was registered in Latvia and Estonia with –31% and –23% respectively. An increase in car-ownership is not necessarily linked with a decrease in the number of buses: between 1995 and 2001, Estonia experienced (compared to other Candidate Countries) a relatively modest increase in the number of cars (+6%) but a considerable decrease in the number of buses and coaches (-23%).

Less lorries in Lithuania only

With regards to goods road vehicles, a similar progress than in the other two vehicle categories could be recorded. Again between 1995 and 2001, their number increased by an impressive 70% in Turkey and close to 50% in the Czech Republic, Poland and Latvia. Lithuania is the only country where the number of goods road vehicles experienced a decline (-8%).

Table 3.9 Road transport equipment in the Candidate Countries

Passenger cars (in 1000)	1995	1998	1999	2000	2001	of which first registrations 2001	Cars per 1000 inhab. 2001
Bulgaria	1 647.6	1 809.4	1 908.4	1 992.7	2 085.7	5.6%	264
Cyprus	219.7	249.2	257.0	267.6	280.1	8.8%	368
Czech Republic	3 043.3	3 493.0	3 439.7	3 438.9	3 529.8	5.9%	343
Estonia	383.4	451.0	458.7	463.9	407.3	6.3%	299
Hungary	2 245.4	2 218.0	2 255.5	2 364.7	2 482.8	7.7%	244
Latvia	331.8	482.7	525.6	556.8	586.2	6.5%	249
Lithuania	718.5	980.9	1 089.3	1 172.4	1 133.5	6.3%	326
Malta	180.9	174.8	182.3	189.1	195.4	5.3%	497
Poland	7 517.3	8 890.8	9 282.8	9 991.3	10 503.1	4.3%	272
Romania	2 197.5	2 822.3	2 980.0	3 128.8	3 225.5	3.0%	144
Slovak Republic	1 015.8	1 196.1	1 236.4	1 274.2	1 292.8	5.2%	240
Slovenia	709.6	813.4	848.3	868.3	884.2	6.3%	444
Turkey	3 058.5	3 838.3	4 072.3	4 422.2	4 534.8	2.6%	66
Buses and coaches (in 1000)	1995	1998	1999	2000	2001	of which first registrations 2001	
Bulgaria	41.0	41.5	42.0	42.3	42.9	3.0%	
Cyprus	2.7	2.8	2.8	2.9	3.0	4.6%	
Czech Republic	19.8	20.0	19.0	18.9	18.4	:	
Estonia	7.2	6.4	6.3	6.2	5.5	10.2%	
Hungary	20.5	18.8	18.0	18.1	17.9	5.5%	
Latvia	16.8	11.8	11.9	11.8	11.6	4.7%	
Lithuania	17.6	15.7	16.1	15.5	15.6	3.7%	
Malta	1.0	1.1	1.1	1.1	1.1	1.6%	
Poland	85.1	80.6	78.7	82.4	82.2	4.1%	
Romania	42.0	45.5	47.3	48.1	48.5	0.8%	
Slovak Republic	12.1	11.5	11.3	11.1	10.9	3.0%	
Slovenia	2.5	2.3	2.3	2.3	2.2	5.8%	
Turkey	263.2	319.9	333.9	354.3	358.7	1.9%	
Goods road vehicles (in 1000)	1995	1998	1999	2000	2001	of which first registrations 2001	
Bulgaria	264	283	293	301	312	4.3%	
Cyprus	101	109	111	115	118	6.8%	
Czech Republic	219	280	289	298	321	9.2%	
Estonia	:	:	:	:	:	:	
Hungary	325*	337	328	353	366	11.3%	
Latvia	69	85	90	97	100	5.0%	
Lithuania	109	99	97	99	100	6.8%	
Malta	:	:	:	:	:	:	
Poland	1 355	1 564	1 684	1 880	1 979	5.7%	
Romania	343	410	442	449	456	9.4%	
Slovak Republic	:	156	160	153	161	8.5%	
Slovenia	43	50	52	55	56	7.7%	
Turkey	747	1 034	1 109	1 229	1 271	3.6%	

* Including special purpose vehicles.
Source: Eurostat.

Privatisation and consolidation in the airline domain

In a certain number of Candidate Countries, the civil aviation domain has been going through difficult times. Privatisation has often led to substantial changes and it appears that the consolidation process has not yet been finalised. Table 3.10 gives an overview of the civil aircraft fleet as of the first Quarter of 2003.

Bulgaria and Poland are the only countries with a noticeable number of cargo aircraft. For Bulgaria, these aircraft are of the larger category whereas Poland's cargo aircraft are of the category of a maximum take-off weight (MTOW) of less than 100 000 lbs. For all Candidate Countries, the share of passenger aircraft in the total fleet is over 70%, except Bulgaria (62%). Within the passenger aircraft category, those with a seat capacity of 51-150 dominate. The only passenger aircraft with a seat capacity of 251 and over was in service in Cyprus. Turkey is the only country with a noticeable amount of so-called business or executive aircraft (29 units, representing 19% of the entire fleet).

Table 3.10: Candidate Countries' Airfleet¹ by operator country - number of aircraft types in service, 1st quarter 2003

Aircraft type / usage	BG	CZ	CY	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR
Business / Corporate / Executive	1	4	3	1	1	1	2	-	-	3	2	2	29
Freight / Cargo less than 100 000 lbs MTOW	7	3	-	1	4	5	2	-	13	1	-	-	-
Freight / Cargo more than 100 000 lbs MTOW	12	-	-	-	3	-	-	-	-	-	-	-	6
Utility transport / Multi-Role / Convertible	2	8	-	2	5	-	2	-	5	-	3	-	-
Hospital / Ambulance / other special purpose	-	-	-	-	1	-	-	1	1	-	-	-	-
Passenger 50 seats or less	11	19	-	6	6	13	15	4	29	12	7	6	36
Passenger 51 to 150 seats	10	19	2	4	20	11	5	7	27	11	3	-	76
Passenger 151 to 250 seats	15	9	17	-	7	1	-	4	8	3	5	3	12
Passenger 251 seats and more	-	-	1	-	-	-	-	-	-	-	-	-	-
Total aircraft	58	62	23	14	47	31	26	16	83	30	20	11	159

(1) All military aircrafts excluded.
Source: Airclaims CASE2 database.

EFTA Countries

Iceland: car density high and no rail

Indications on the stock of road vehicles of the EFTA countries can be found in Table 3.11. On the basis of data available, it appears that the vehicle density in Iceland is very high: with 542 passenger cars per 1000 inhabitants in 2000, it ranks close to the highest values registered in the EU Member States in 2000 (Luxembourg: 616, Italy: 563 and Germany: 521). Vehicle density in Switzerland approaches the EU average.

The number of goods road vehicles increased in all EFTA countries. Obviously, international goods road transport for Iceland is very limited, explaining the relatively small stock of goods road vehicles.

As in most EU countries, the developments of the Norwegian rail vehicle stock shows a certain decline. The vehicle stock appears to be roughly similar to that of Denmark, however, latter country disposes of a network half as long as that of Norway but a population density that is 9 times as high.

Although Liechtenstein features 18.5 km of railway lines, this country does not offer any rail material since the railways of Liechtenstein are operated by the Austrian railways (ÖBB).

Liechtenstein: 5 aircraft but no airport

Table 3.13 outlines the civil aviation airfleet as in service during the first quarter of 2003. Liechtenstein has 5 aircraft of the business/executive type registered, but the country does not have

an airport. Switzerland, with 281 aircraft in service features a high share of business/executive aircraft (109 units, representing 38% of the fleet). It should be noted that the Norwegian fleet does not include passenger aircraft of the company 'SAS – Scandinavian Airlines', which status is 'multinational'.

Table 3.11: EFTA countries: road transport equipment

Passenger cars (in million)					
	1995	1998	1999	2000	1000 inhab.
Iceland	0.12	0.14	0.15	0.16	542
Liechtenstein	0.02	0.02	0.02	:	:
Norway	1.68	1.79	1.81	1.85	406
Switzerland	3.23	3.38	3.47	3.55	485

Buses and coaches (1 000)				
	1995	1998	1999	2000
Iceland	1.3	1.5	1.6	1.7
Liechtenstein	0.1	0.1	0.1	:
Norway	32.5	36.2	37.0	:
Switzerland	37.0	39.1	39.7	40.2

Goods road vehicles (excl. road tractors) (1 000)				
	1995	1998	1999	2000
Iceland	14.5	15.9	17.1	18.7
Liechtenstein	1.9	2.3	2.4	:
Norway	144.7	156.4	156.5	:
Switzerland	255.6	259.9	266.1	270.3

Number of trailers and semi-trailers (1 000)				
	1995	1998	1999	2000
Iceland	2.5	0.3	0.3	0.4
Liechtenstein	0.2	0.2	0.2	:
Norway	13.2	23.9	26.1	29.2
Switzerland	10.0	10.5	10.8	12.0

Sources: Eurostat, UIC, UNECE, national statistics.

Table 3.13: EFTA Countries' Airfleet¹ by operator country - Number of aircraft types in service, 1st quarter 2003

	IS	LI	NO ²	CH
Aircraft type / usage				
Business / Corporate / Executive	-	5	5	106
Freight / Cargo less than 100 000 lbs MTOW	-	-	-	7
Freight / Cargo more than 100 000 lbs MTOW	7	-	-	1
Utility transport / Multi-Role / Convertible	2	-	1	-
Hospital / Ambulance / other special purpose	-	-	1	4
Passenger 50 seats or less	10	-	43	70
Passenger 51 to 150 seats	1	-	36	42
Passenger 151 to 250 seats	12	-	-	49
Passenger 251 seats and more	3	-	-	2
Total aircraft	35	5	86	281

- (1) All military aircrafts excluded.
(2) Excludes SAS passenger aircraft.
Source: Airclaims CASE2 database.

Table 3.12: EFTA Countries: Rail transport equipment

Stock of locomotives and railcars (units)				
	1995	1998	1999	2000
Iceland	-	-	-	-
Liechtenstein	-	-	-	-
Norway	380	430	330	344
Switzerland	1 699	:	:	:

Goods transport rail wagons (1 000)				
	1995	1998	1999	2000
Iceland	-	-	-	-
Liechtenstein	-	-	-	-
Norway	4.1	3.0	2.8	2.6
Switzerland	22.8	:	:	:

Passenger rail transport wagons (units)				
	1995	1998	1999	2000
Iceland	-	-	-	-
Liechtenstein	-	-	-	-
Norway	897	801	849	768
Switzerland	3 879	:	:	:

Sources: Eurostat/ECMT/UNECE.

4. Enterprises, economic performance and employment

4.1. Enterprises and employment

The evolution of the transport sector is highly influenced by general economic activity. There is indeed a close inter-relation between the transport sector and the other sectors of the economy: the other sectors need an efficient transport sector to develop and the transport sector is dependent on the other sectors' activity.

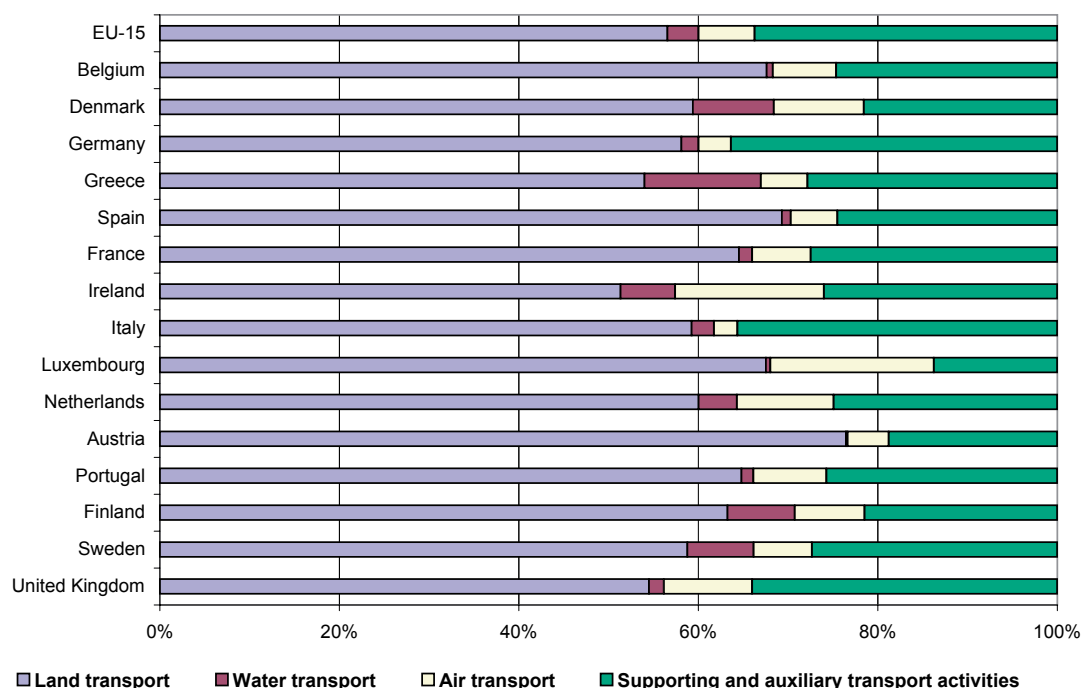
Transport: more than 7 million jobs at Community level

The importance of the transport branch in the EU economy is best illustrated by the number of jobs it is generating: according to the latest available Labour Force Survey (LFS) results (the second quarter of the year 2001), more than 7 million persons were employed in the transport sector at EU-15 level. This includes the following four categories according to the Statistical Classification of Economic Activities in the European Community (NACE, Rev. 1):

- land transport (freight and passenger transport via railways, by road and via pipelines), NACE 60
- water transport (both maritime and inland waterway transport), NACE 61
- air transport, NACE 62, and
- supporting and auxiliary transport activities (NACE 63).

Graph 4.1 shows the relative share in employment of the individual four transport categories. Land transport is the most important transport activity in terms of employment in all Member States. The EU average for land transport can be established at about 57 % of the total jobs in the transport sector, according to the Structural Business Statistics (SBS). Land transport takes a particularly high share in Austria with three quarters of all the jobs in the transport sector while supporting and auxiliary transport

Graph 4.1: Share of persons employed in various transport activities (NACE 60-63) - 2000*



* 2001: FR, IT, AT, PT, FI, SE.

Source: Eurostat (Structural Business Statistics).

Table 4.2: Number of enterprises by employment size class in 2000

	Total land transport (incl. pipelines)				Railways				Road transport			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Belgium	9 419	185	18	9 622	:	:	:	3	9 407	185	17	9 609
Denmark	11 763	144	8	11 932	10	6	1	17	11 759	144	8	11 911
Germany	53 000	1 117	114	54 233	73	18	14	106	52 904	1 094	100	54 098
Greece	:	:	:	:	:	:	:	:	:	:	:	:
Spain	196 913	424	48	197 385	0	c	c	7	196 913	367 ¹	42 ¹	197 378
France	76 763	1 200	152	78 115	24	4	2	30	76 708	1 195	149	78 052
Ireland	2 374 ^{1,p}	10 ¹	c	c	c	c	c	c	c	c	c	c
Italy	135 041	534	119	135 694	95	22	22	139	134 927	510	96	135 533
Luxembourg	617 ²	33 ²	2 ²	652 ²	0	0	1	1	617 ²	33 ²	1 ²	651 ²
Netherlands	13 475	450	65	13 990	:	:	:	5	13 460	450	65	13 975
Austria	8 932	202	16	9 150	9	2	3	14	8 921	200	13	9 134
Portugal	17 010	135	30	17 175	c	0	c	c	c	135	27 ¹	17 172
Finland	20 824	72	17	20 913	2	0	2	4	20 822	72	15	20 909
Sweden	24 941	151 ¹	19 ¹	25 122	c	c	:	27	c	c	c	25 084
United Kingdom	45 569	713	182	46 464	c	3	c	111	45 463	705	157	46 325

	Water transport (maritime and inland waterway)				Air transport				Supporting and auxiliary transport activities			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Belgium	326	:	:	327	107	5	7	119	3 276	167	25	3 468
Denmark	432	20	5	457	89	5	5	99	1 785	82	17	1 884
Germany	1 768	47	8	1 823	251	9	9	270	16 467	827	171	17 466
Greece	:	:	:	:	:	:	:	:	:	:	:	:
Spain	163	19	5	187	37	c	c	51	17 911	365	70	18 346
France	1 893	27	10	1 930	498	19	14	531	10 024	572	178	10 774
Ireland	c	c	c	c	c	c	c	c	523 ^{1,p}	20 ^{1,p}	:	:
Italy	1 329	52	17	1 398	167	19	10	196	23 745	714	115	24 574
Luxembourg	:	:	:	:	:	:	:	:	201 ²	7 ²	1 ²	209 ²
Netherlands	4 315	25	15	4 355	165	5	5	175	5 825	175	55	6 055
Austria	66	0	0	66	74	2	3	79	2 155	83	18	2 256
Portugal	86	15	0	101	:	c	:	23	2 340	47	9	2 396
Finland	294	12	7	313	59	0	2	61	1 810	68	12	1 890
Sweden	788	35 ¹	9 ¹	837	165	7 ¹	5 ¹	175	4 554	95	32	4 681
United Kingdom	1 187	33	15	1 235	842	55	37	934	15 824	619	174	16 617

'c' = confidential, 'p' = provisional.

(1) 1999

(2) 1998

Source: Eurostat (Structural Business Statistics).

activities, consisting of cargo handling, storage and warehousing, other supporting transport activities and activities of travel and transport agencies as well as tour operators have an over-average share in Germany and Italy (both 36 %).

Within the land transport category, nearly all enterprises belong to road transport. In terms of employment, road transport takes a share of more than 90 % in land transport for Denmark, Spain, Portugal, Sweden and the United Kingdom. In the railway sector, Belgium and Luxembourg had the highest share of employment: more than 30 %.

Low infrastructure costs for road transport enterprises

As can be seen in Table 4.2, the number of land transport enterprises is by far the highest in all countries for which data are available. Road transport enterprises account for a very large part in this category. The companies are fairly

small and the costs for the infrastructure are relatively low. Railway and pipeline enterprises are far lower in number as a result of the high infrastructure costs and the still limited liberalisation of the railway transport sector.

Greece, Finland and Denmark: highest employment in water transport

The employment share in water transport is particularly low in Luxembourg and Austria, countries that do not dispose of access to open seas. The employment in these Member States can largely be attributed to inland waterway transport activities only. Despite having access to the sea and featuring Antwerp as one of the major European ports, low employment in water transport is also registered in Belgium. The highest shares of the employment in water transport are registered in Greece and the Scandinavian Member States. The geographical

features of these countries, some with a considerable amount of islands, explain this relatively high employment.

France is a special case as, even with a large maritime coastal area and many kilometres of inland waterways, it has very few people employed in water transport (just 1.5 %).

Table 4.2 shows that a high proportion of the enterprises is of the smallest category (1–49 persons). Although not obvious from the table presented, an important rate of self-employment is typical for inland waterway transport.

Air transport: 6% employment share at EU level —

Among the four sectors observed, air transport shows the lowest number of enterprises. However, the distribution of the enterprises by size-classes displays the same pattern as for the

other transport sectors: the enterprises with less than 50 persons employed have the highest share.

From Graph 4.1, it appears that at Community level, the average employment share of air transport was 6 %. Luxembourg shows the highest share with over 18 %. In a geographically small country, this has an important impact on the distribution of shares. However, this should be seen in the light of lowest number of persons employed in absolute figures compared to the other Member States.

Highest share of auxiliary activities for Germany —

‘Supporting and auxiliary transport activities’ display the second highest employment figures within the four categories considered (except for Luxembourg, where air transport is 2nd).

Table 4.3: Number of persons employed by enterprise size class in 2000

	Total land transport (incl. pipelines)				Railways				Road transport			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Belgium	56 414	15 911	61 828	134 153	:	:	:	42 249	:	15 911	19 628	91 889
Denmark	43 653	11 711	15 444	70 808	:	:	:	9 630	:	:	:	70 888
Germany	321 537	97 413	189 013	607 951	:	:	:	90 607	320 409	93 747	102 516	516 660
Greece	:	:	:	:	:	:	:	:	:	:	:	:
Spain	378 370	40 177	76 807	495 354	0	:	:	39 065	378 370	:	:	456 289
France	270 271	123 474	292 126	685 871	108	:	:	175 890	:	:	:	:
Ireland ¹	11 566	1 531	:	:	:	:	:	:	:	:	:	:
Italy	309 997	52 141	218 087	580 225	871	:	:	129 543	309 064	49 112	91 986	450 162
Luxembourg ²	3 700	3 377	3 078	10 155	0	0	3 078	3 078	3 700	:	:	7 077
Netherlands	91 727	44 416	68 709	204 852	:	:	:	:	91 573	44 339	:	:
Austria	51 195	18 933	68 284	138 412	:	:	:	52 554	:	:	:	85 773
Portugal	49 855	13 760	26 751	90 366	:	0	:	:	13 760	:	:	84 041
Finland	:	7 542	:	71 869	:	0	:	9 799	:	7 542	:	62 070
Sweden	72 829	:	:	127 066	:	:	:	12 273	:	:	:	114 770
United Kingdom	221 300	63 902	285 947	571 149	:	:	:	48 754	:	:	:	522 043

	Water transport (maritime and inland waterway)				Air transport				Supporting and auxiliary transport activities			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Belgium	1 134	:	0	1 389	:	:	:	14 008	18 628	15 812	14 456	48 896
Denmark	3 053	2 176	5 529	10 758	682	:	:	11 958	10 010	:	:	25 696
Germany	12 464	4 375	3 243	20 083	1 447	1 007	35 445	37 901	131 897	79 473	169 091	380 456
Greece	:	:	:	:	:	:	:	:	:	:	:	:
Spain	1 822	1 763	3 560	7 145	472	:	:	37 157	83 591	37 120	54 321	175 032
France	4 619	3 046	8 269	15 934	5 593	2 074	59 575	67 242	62 229	62 000	153 774	278 003
Ireland ¹	:	:	:	:	:	:	:	:	6 107	3 236	:	:
Italy	:	5 085	:	20 245	:	2 013	:	25 331	112 937	72 466	72 976	258 379
Luxembourg ²	:	:	:	:	:	0	:	2 429	:	:	:	1 987
Netherlands	6 332	2 175	5 201	13 708	:	:	:	:	33 031	17 880	:	:
Austria	:	0	0	274	:	:	:	8 775	11 587	9 423	13 322	34 332
Portugal	:	:	:	1 783	:	:	:	11 236	14 731	5 176	13 012	32 919
Finland	:	1 477	:	8 430	:	0	:	9 717	7 080	7 452	8 221	22 753
Sweden	2 865	:	:	15 469	824	:	:	13 215	17 233	9 383	27 476	54 092
United Kingdom	:	3 395	:	17 502	:	6 770	:	103 211	104 680	62 943	188 699	356 322

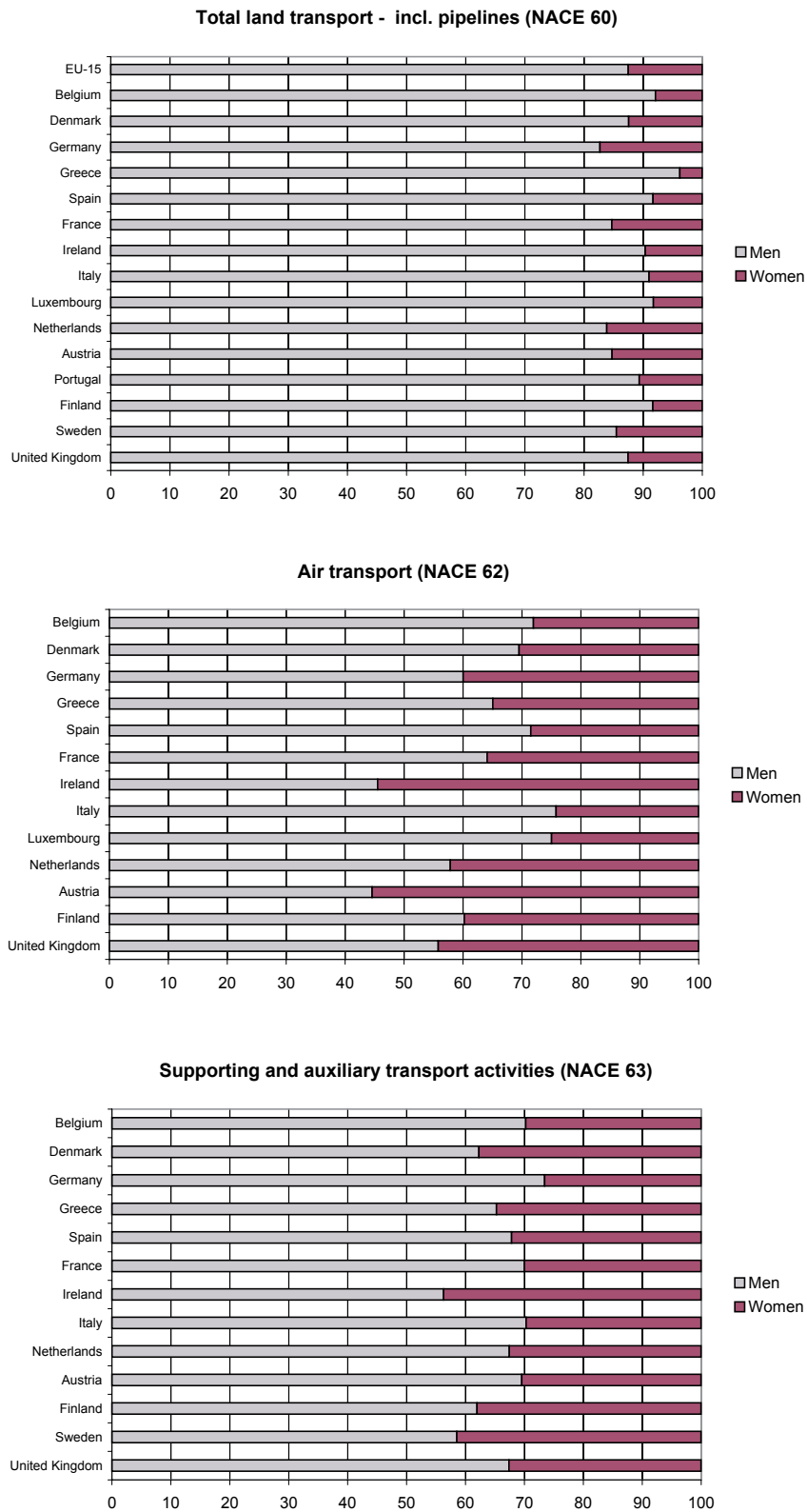
Note: For Netherlands and Portugal employment size classes are defined in terms of employees.

(1) 1999

(2) 1998

Source: Eurostat (Structural Business Statistics).

Graph 4.4 : Share of sexes in persons employed (in %), by NACE classification 2nd quarter 2001



Source: Eurostat (Labour Force Survey).

Germany and Italy score slightly higher than the EU average (which is about 34%). Most Member States registered far lower shares, often well under 30 %. Austria and Luxembourg are lowest with a share of 14 % and 19 % respectively).

Table 4.3 outlines the number of persons employed by enterprise size class in 2000. Data for Ireland refer however to 1999 and those of Luxembourg to 1998.

Low female employment in land transport

Graph 4.4 gives an insight of the distribution of employment by sex in three of the transport categories considered. The source of these data is the Labour Force Survey (LFS). According to LFS, the data related to water transport for the majority of the countries were statistically uncertain and therefore, the graph for this mode of transport could not be presented.

From Graph 4.4 it appears that land transport, largely consisting of road transport, is dominated by male employment. At EU level, 13 % of the employment is taken up by women, the two extremes consisting of Greece and Germany with 4 % and 17 % female employment respectively. However, with regards to the question of reliability mentioned earlier, the data on land transport by sex for Greece, Ireland, Luxembourg and Portugal should be carefully used.

Austria and Ireland: minority of men in air transport

Due to uncertain data for Portugal and Sweden, these two countries are not shown in the graph on air transport. As a consequence, EU-15 data also could not be presented.

In two Member States men constitute a minority in air transport employment: Austria (45 %) and Ireland (46 %). The highest share of men in the employment displays Italy: 76 %.

It should be stressed that data for Denmark, Greece, Ireland, Luxembourg and Finland are uncertain.

Heterogeneity of auxiliary activities

Supporting and auxiliary transport activities incorporate quite heterogeneous activities like cargo handling, storage and warehousing but also supporting activities relating to land, water and air transport as well as employment in travel agencies and the like.

Because of uncertain data for Luxembourg and Portugal, these two countries have been excluded from the graph on auxiliary activities, and as a consequence, EU-15 data could not be presented.

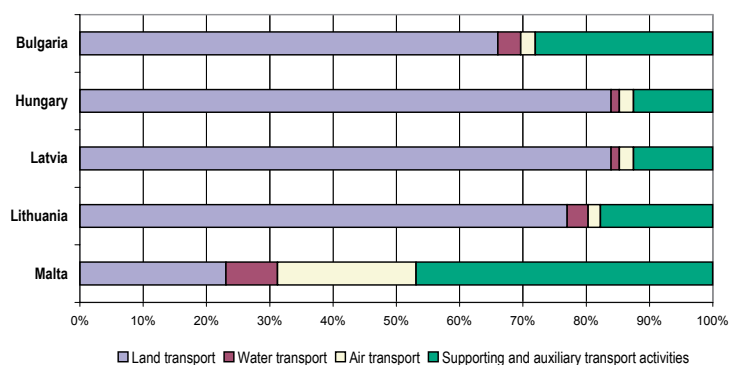
Comparing the countries presented in Graph 4.4, it can be noticed that for the majority, the share of male employment is situated between 60-70 % of the total employment. Germany displays the highest share of male employment with 73 %.

Candidate Countries

Graph 4.5 outlines, for five Candidate Countries only, the number of persons employed in the various subsectors of transport. Malta displays a limited number of jobs in land transport, whereas air transport and – at a lesser degree – water transport take a substantial share. The other countries for which data are available offer a more «mainstream» image, although the supporting and auxiliary transport activities are still underrepresented compared to most EU Member States.

Table 4.6 shows, for the year 2000, the number of enterprises by employment size class and Table 4.7 the number of persons employed by enterprise size class. Data availability is sometimes limited; however, it is improving. It should be noted that data cannot be disseminated for reasons of statistical confidentiality in some cases.

Graph 4.5: Selected Candidate Countries: share of persons employed in various transport activities (NACE 60-63) - 2000



Source: Eurostat.

Table 4.6: Candidate Countries: number of enterprises by employment size class in 2000

	Total land transport (incl. pipelines)				Railways				Road transport			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Bulgaria	:	:	:	:	:	:	:	:	:	:	:	:
Cyprus	:	:	:	:	:	:	:	:	:	:	:	:
Czech Republic	53 857	161	65	54 083	42 ¹	3 ¹	4 ¹	49 ¹	31 386 ¹	130 ¹	64 ¹	31 580 ¹
Estonia	1 109	48	10	1 292	1	4	4	9	1 108	44	6	1 283
Hungary	1 788	82	38	1 908	7 ¹	2 ¹	2 ¹	11 ¹	1 595 ¹	71 ¹	36 ¹	1 702 ¹
Latvia	1 271	47	10	1 340	2 ^p	0 ^p	1 ^p	4 ^p	1 269	47	8	1 335
Lithuania	4 472	121	11	4 604	:	:	:	:	:	:	:	:
Malta	:	:	:	:	:	:	:	:	:	:	:	:
Poland	c	353	147	c	c	9 ^p	c	c	c	344	c	c
Romania	9 481	334	49	9 864	c	c	c	c	9 464	329	44	9 837
Slovak Republic	218	50	285	553	0	0	c	c	26 ¹	56 ¹	61 ¹	143 ¹
Slovenia	c	c	c	c	:	:	c	c	7 845 ¹	23 ¹	7 ¹	7 875 ¹
Turkey	:	:	:	:	:	:	:	:	:	:	:	:

	Water transport (maritime and inland waterway)				Air transport				Supporting and auxiliary transport activities			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Bulgaria	:	:	:	:	:	:	:	:	:	:	:	:
Cyprus	:	:	:	:	:	:	:	:	:	:	:	:
Czech Republic	78 ¹	2 ¹	1 ¹	81 ¹	23 ¹	16 ¹	1 ¹	40 ¹	:	70	c	7 119
Estonia	9	5	3	17	3	2	1	6	651	35	5	741
Hungary	c	c	c	22	6 ¹	1 ¹	1 ¹	8 ¹	614	55	13	682
Latvia	13	2	0	16	11 ^p	1 ^p	1 ^p	13 ^p	1 041	50	8	1 114
Lithuania	16	2	2	20	12	1	1	14	902	27	7	936
Malta	:	:	:	:	:	:	:	:	:	:	:	:
Poland	296	c	c	e	c	c	c	c	9 974	168	e	c
Romania	107	22	6	135	:	c	c	:	1 801	77	26	1 904
Slovak Republic	c	0	c	c	:	0	0	c	:	c	c	570
Slovenia	c	c	:	e	:	:	:	18	:	c	c	722
Turkey	:	:	:	:	:	:	:	:	:	:	:	:

'c' = confidential.

(1) 1999

Source: Eurostat (Structural Business Statistics).

Table 4.7: Candidate countries: Number of persons employed by enterprise size class in 2000

	Total land transport (incl. pipelines)				Railways				Road transport			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Bulgaria	:	:	:	:	:	:	:	:	:	:	:	:
Cyprus	:	:	:	:	:	:	:	:	:	:	:	:
Czech Republic	71 750	15 773	136 753	224 276	:	:	:	:	:	:	:	132 749
Estonia	:	4 303	:	22 204	:	:	:	:	:	:	:	:
Hungary	17 975	6 760	103 402	128 137	:	:	:	:	:	:	:	70 657
Latvia	8 682	4 394	5 026	38 683	:	:	:	:	8 639	4 394	:	:
Lithuania	:	10 514	:	53 868	:	:	:	:	:	:	:	:
Malta	:	:	:	:	:	:	:	:	:	:	:	:
Poland ¹	:	39 786	:	:	:	:	:	:	:	:	:	:
Romania	38 748	34 947	158 755	232 450	:	:	:	:	38 642	34 257	51 779	124 678
Slovak Republic	:	5 179	:	74 579	:	:	:	:	:	5 179	:	:
Slovenia	:	:	:	:	:	:	:	:	:	:	:	:
Turkey	:	:	:	:	:	:	:	:	:	:	:	:

	Water transport (maritime and inland waterway)				Air transport				Supporting and auxiliary transport activities			
	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total	1 - 49	50 - 249	250 >	Total
Bulgaria	:	:	:	:	:	:	:	:	:	:	:	:
Cyprus	:	:	:	:	:	:	:	:	:	:	:	:
Czech Republic	:	:	:	1 700	:	:	:	:	:	6 955	:	32 304
Estonia	:	:	:	:	:	:	:	:	:	3 370	:	10 380
Hungary	:	:	:	1 996	:	:	:	3 435	4 716	4 723	9 658	19 097
Latvia	:	:	:	356	:	:	:	577	:	4 427	:	14 880
Lithuania	:	:	:	2 317	:	:	:	1 363	:	2 216	:	12 421
Malta	:	:	:	:	:	:	:	:	:	:	:	:
Poland ¹	:	:	:	6 522	:	:	:	:	31 493	15 409	31 578	78 480
Romania	1 080	2 791	2 818	6 689	:	:	:	:	9 693	8 405	21 332	39 430
Slovak Republic	:	0	:	:	:	0	0	:	:	:	:	7 141
Slovenia	:	:	:	:	:	:	:	:	:	:	:	:
Turkey	:	:	:	:	:	:	:	:	:	:	:	:

(1) 1998.

Source: Eurostat (Structural Business Statistics).

4.2 Economic performance

Transport activities are important contributors to wealth creation. There are various ways to express the economic performance of an economic sector. In the case of the transport sector, composed of various sub-sectors, the choice is limited to those indicators for which disaggregated data are available. Thus, in the frame of this chapter, data on turnover, value added and investment will be highlighted.

Table 4.8 offers details on turnover per activity for the individual Member States — as far as those are available. Expressed in million EUR, auxiliary transport activities generally offer the highest turnover figures at EU-level.

Small but 'strategic' countries feature high land transport turnover

According to SBS data, turnover in total land transport exceeded EUR 40 000 million in Germany, France, Italy and the United Kingdom in 2000. Small but geographically 'strategic' countries like the Netherlands and Belgium (as gateways to the rest of Europe) offer relatively high turnover figures as well. On the basis of available data, road transport is generating more than 80% of the land transport turnover in the majority of countries, except for Germany and Luxembourg. In Spain and Portugal the turnover of road transport represents close to 95% of the land transport turnover.

The figures for the water transport category reflect the relative importance of maritime transport in countries like Denmark, Germany, France, Italy, the Netherlands and the United

Kingdom. For all countries mentioned, the turnover of the water transport sector exceeds EUR 5 000 million, the highest value being registered by Denmark (almost EUR 12 500 million) and Germany (EUR 9 800 million).

With relatively few persons employed, the air transport category generates impressive turnover figures: the United Kingdom displays nearly EUR 30 000 million followed by France and Italy with EUR 15 000 million and EUR 11 000 million respectively.

Auxiliary transport activities largely in front in Belgium, Germany and the UK

Turnover figures of auxiliary transport activities often exceed those of total land transport. They do by a large margin in Belgium, Germany and the United Kingdom. In the latter one the turnover of auxiliary activities exceeds considerably that of the total land transport sector, while in Luxembourg the situation is the opposite.

Table 4.9 gives an overview of the value added by activity. Land transport generally offers the highest figures, followed by the auxiliary transport activities.

Both tables 4.8 and 4.9 should thus be seen in the light of the number of jobs the various categories create. The employment in the auxiliary transport activities branch is much lower than in the land transport category (see chapter 4.1), although turnover figures are sometimes similar.

Table 4.8: Turnover by activity in 2000 - in million EUR

	Total land transport (incl. pipel.)	Rail transport	Road transport	Water transport (marit. + iww.)	Air transport	Auxiliary transport activities
Belgium	11 050	1 576 ¹	9 244	1 407	4 200	16 565
Denmark	6 210	891	5 755 ¹	12 478	2 388	6 828
Germany	46 212	11 836	34 029	9 800	7 397	68 387
Greece	.	.	.	.	.	.
Spain	27 926	1 564	26 362	1 197	6 449	32 549
France	55 840	.	.	5 549	14 926	53 314
Ireland	2 158	.	.	305 ²	1 372 ²	2 689 ³
Italy	42 419	6 119	36 149	5 239	10 972	40 803
Luxembourg	1 015	258	756	251 ²	1 113	547
Netherlands	17 905	.	16 236	5 199	.	8 884 ³
Austria	9 046	.	7 250	90	2 304	10 774
Portugal	3 824	.	3 607	362	1 429	4 819
Finland	5 689	725	4 964	2 227	1 654	4 429
Sweden	13 164	1 332	11 840	3 762	3 200	14 900
United Kingdom	55 560	8 682	46 587	6 954	29 385	92 882

(1) 1999.

(2) 1997.

(3) 1998.

Source: Eurostat (Structural Business Statistics).

Table 4.9 : Value added by activity in 2000 - in million EUR

	Total land transport (incl. pipelines)	Rail transport	Road transport	Water transport (marit. + inl.wv.)	Air transport	Auxiliary transport activities
Belgium	6 157	2 113 ¹	3 896	137	489	3 066
Denmark	3 039	532	3 267 ¹	1 928	736	1 250
Germany	23 481	4 060	19 246	2 711	7 797 ¹	23 827
Greece	:	:	:	:	:	:
Spain	14 104	2 376	11 728	404	2 235	8 433
France	26 088	:	18 645 ²	814	3 784	15 405
Ireland	961	:	:	82 ³	440 ³	522 ⁴
Italy	18 538	4 812	13 687	1 582	1 266	11 984
Luxembourg	521	187	334	21 ³	352	136
Netherlands	8 401	:	7 758	1 561 ¹	:	4 302 ⁴
Austria	5 806	:	3 463	18	506	1 924
Portugal	1 627	:	1 555	82	497	1 338
Finland	2 958	476	2 482	588	624	1 039
Sweden	4 812	808	4 003	903	945	2 755
United Kingdom	25 059	3 350	21 601	2 724	11 535	22 428

(1) 1999.

(2) 2001.

(3) 1997.

(4) 1998.

Source: Eurostat (Structural Business Statistics).

Ratio comparisons between countries rather than sub-sectors

The performance of the categories of transport under analysis is outlined in Table 4.10, which presents the ratios 'turnover per persons employed'. It should be noted that turnover per person comparisons should rather be made between countries and not between sub-sectors since they do not take into account infrastructure costs. And even so, infrastructure costs can vary substantially from country to country.

The average turnover per person employed in total land transport exceeds EUR 90 000 only in Luxembourg, Sweden and the United Kingdom. Conversely, Spain, Italy, Austria and Portugal are well below the EU average (EUR 79 000 — calculated on the basis of available data).

The water and air transport sub-categories, as well as the auxiliary transport activities all display much higher figures compared to the land transport, although substantial differences between countries can be noticed.

Belgium's and Denmark's water transport activities showed an exceptionally high turnover per person employed of more than one million EUR, while at the other extreme, recorded data of Spain were under EUR 200 000 in terms of turnover per person in 2000.

The water transport domain regroups both maritime transport and transport via inland waterways. Due to the diverse national characteristics of water transport in the various Member States, a comparison between countries should be done with caution.

In the air transport sector, Italy displays EUR 433 200 per person employed, just ahead of Luxembourg (EUR 387 200 per person). Belgium and the United Kingdom feature a turnover per person employed of around EUR 300 000. Portugal recorded the lowest ratio and generates only 30 % of the turnover per person employed of that of Italy.

The auxiliary transport activities had turnover levels above EUR 300 000 per person employed in Belgium and Austria only. At the other end, Italy, Portugal and the Netherlands generate less than half that figure.

Apparent labour productivity in water transport often highest

The comparison across sub-sectors becomes possible when looking at the apparent labour productivity (value added per person employed — see Table 4.11), a ratio that expresses the amount of value added in the production value in relation to employment. The available data allow an insight on how the various sub-sectors perform.

For the majority of the Member States, apparent labour productivity was the highest in the water transport sector, while the land transport activity showed the lowest figures for all Member States (for the countries for which data were available).

Only a few countries show an apparent labour productivity exceeding EUR 100 000 per person employed. With regards to water transport, this is only the case for the Netherlands, in air transport, this counts for Germany, Luxembourg and the United Kingdom.

Table 4.10 : Turnover per person employed in 2000 - in 1000 EUR

	Total land transport (incl. pipelines)	Rail transport	Road transport	Water transport (marit. + incl. ww.)	Air transport	Auxiliary transport activities
Belgium	82.4	38.1 ¹	100.6	1012.4	299.8	338.8
Denmark	87.7	92.5	81.2 ¹	1159.8	199.7	265.7
Germany	76.0	130.6	65.9	488.0	195.2	179.7
Greece	:	:	:	:	:	:
Spain	56.4	40.0	57.8	167.6	173.5	186.0
France	81.4	:	81.2 ³	348.2	222.0	191.8
Ireland	81.2	:	:	:	220.7 ²	199.7
Italy	73.1	47.2	80.3	258.8	433.2	157.9
Luxembourg	95.2	82.7	100.3	340.6 ³	387.2	251.7
Netherlands	86.9	:	:	376.8	:	226.9 ³
Austria	65.4	:	84.5	328.8	262.5	313.8
Portugal	42.3	:	42.9	202.9	127.2	146.4
Finland	79.2	74.0	80.0	264.1	170.2	194.7
Sweden	103.6	107.7	103.2	243.2	242.1	275.5
United Kingdom	97.3	178.1	89.2	397.3	284.7	260.7

(1) 1999.

(2) 1997.

(3) 2001.

Source: Eurostat (Structural Business Statistics).

The sub-sector largely determines the type of investment

Finally, Table 4.12 offers an overview of the investment per person employed. They include investments made by private companies only. Only in certain cases (notably in rail and air transport), a small part of the investments might originate from public bodies, depending on a company's structure and ownership. Investments in the transport sector are quite heterogeneous: in road and water transport, this will mainly

consist in the acquisition of transport equipment. In rail transport, this will also include investments made in infrastructure (tracks, railway stations). Supporting and auxiliary transport services include, among others, cargo handling, storage and warehousing; infrastructural investments thus take an important share in this sub-sector. Table 4.12 shows that the importance of the sectors is shared: for most countries, either the water transport sector displays the highest figures (Denmark, Spain, Ireland, Italy, the

Table 4.11 : Apparent labour productivity (value added/employment) in 2000 - in 1000 EUR

	Total land transport (incl. pipelines)	Rail transport	Road transport	Water transport (marit. + incl. ww.)	Air transport	Auxiliary transport activities
Belgium	45.9	51.0 ³	42.4	98.7	34.9	62.7
Denmark	42.9	55.3	46.1 ³	179.2	61.5	48.7
Germany	38.6	44.8	37.3	135.0	159.1 ³	62.6
Greece	:	:	:	:	:	:
Spain	28.5	60.8	25.7	56.6	60.2	48.2
France	38.0	:	36.0 ⁴	51.1	56.3	55.4
Ireland	36.2	:	:	49.4 ²	70.7 ²	38.8 ^{1,P}
Italy	32.0	37.1	30.4	78.2	50.0	46.4
Luxembourg	48.8	59.8	44.3	26.8 ⁴	122.3	62.5
Netherlands	40.8	:	41.3 ⁴	113.1	:	62.8 ⁴
Austria	41.9	:	40.4	67.1	57.7	56.0
Portugal	18.0	:	18.5	46.0	44.3	40.6
Finland	41.2	48.6	40.0	69.7	64.2	45.6
Sweden	37.9	65.9	34.9	58.4	71.5	50.9
United Kingdom ²	43.9	68.7	41.4	155.6	111.8	62.9

(1) 1998.

(2) 1997.

(3) 1999.

(4) 2001.

Source: Eurostat (Structural Business Statistics).

Table 4.12 : Investment per person employed in 2000 - in 1000 EUR

	Total land transport (incl. pipelines)	Rail transport	Road transport	Water transport (marit. + incl.wv.)	Air transport	Auxiliary transport activities
Belgium	18.5	29.9 ²	11.5	15.0	28.8	20.4
Denmark	11.4	29.1	9.9 ²	72.0	40.5	11.7
Germany	11.0	17.8 ²	9.8	11.2	43.6 ²	9.7
Greece	:	:	:	:	:	:
Spain	6.5	16.7	5.7	32.9	16.0	12.3
France	9.0	:	6.3 ³	19.8	24.6	17.9
Ireland	17.8	:	:	54.7 ¹	28.3 ¹	12.8 ¹
Italy	5.8	2.3	6.6	59.1	37.8	7.0
Luxembourg	21.3 ¹	47.8 ¹	7.9 ¹	:	113.3 ¹	6.7 ¹
Netherlands	5.9	:	:	52.8	:	13.8 ³
Austria	19.8	:	15.3	91.4	59.3	9.0
Portugal	12.3	:	12.0	7.8	13.3	38.0
Finland	10.4	11.2	10.3	7.6	18.4	9.6
Sweden	12.3	8.0	12.7	19.2	40.1	16.3
United Kingdom	7.7	5.3	7.8	18.5	33.6	22.3

(1) 1997.

(2) 1999.

(3) 2001.

Source: Eurostat (Structural Business Statistics).

Netherlands and Austria), or it is air transport that shows the highest volumes (Germany, France, Finland, Sweden and the United Kingdom). Compared to the other transport sub-sectors,

auxiliary transport activities show the highest investment per person employed in Portugal. Investments in rail transport comes first in Belgium, albeit by a small margin.

Candidate Countries

Tables 4.13 to 4.17 covers the same type of information as the previous tables did for the EU Member States. The overall data availability for Member States is obviously better than for the Candidate Countries, but data availability for Candidate Countries is gradually improving. The available turnover figures in Table 4.13 suggest that the road transport sector remains relatively important for Bulgaria, Hungary, Romania and Slovenia whereas auxiliary transport activities rather generate the highest turnover in the Baltic States. Due to the particular geographical and economical situation, auxiliary transport activities are of special importance for Malta. The same can be said for air transport.

The highest value added is generally generated in land transport, except for Malta and certain Baltic States (see Table 4.14).

The available figures expressing turnover per person employed in EUR (Table 4.15) indicate that the Candidate Countries are considerably lagging behind the EU-Member States, although the average market conversion rates do not reflect the actual purchasing power of the various countries' currencies. Only in air transport, countries like Hungary and Malta display figures that come close to certain EU Member States, however still far from the EU average. A broadly similar picture can be drawn when looking at the productivity figures (Table 4.16).

In countries facing serious economic changes, private investments have the tendency to fluctuate and are low in absolute terms (see Table 4.17). Due to its particular geographical situation, Malta's investments are mainly focussed on water- and air transport as well as auxiliary transport activities. Malta does not dispose of railways.

Table 4.13: Candidate Countries: Turnover by activity - in million ECU/EUR

	Total land transport (incl. pipel.)	Rail transport	Road transport	Water transport (marit. + iww.)	Air transport	Auxiliary transport activities
Bulgaria	1 323	:	1 164	:	:	485
Cyprus	:	:	:	:	:	:
Czech Republic	5 054	:	2 794	35	:	3 153
Estonia	492	:	:	268 ¹	58 ¹	1 118
Hungary	2 922	793	2 129	44	444	1 321
Latvia	533	:	25 ¹	6	60	954
Lithuania	691	:	:	84	72	480
Malta	67	0	67	51	247	421
Poland	:	:	:	549 ²	:	3 062 ²
Romania	2 384	772 ¹	1 054	149	161 ²	940
Slovak Republic	862	:	309 ¹	23 ²	18 ¹	484
Slovenia	972 ¹	14 ¹	825 ¹	17 ¹	95 ¹	795 ¹
Turkey	:	:	:	:	:	:

(1) 1999.
(2) 1998.

Source: Eurostat (Structural Business Statistics).

Table 4.14: Candidate Countries: Value added by activity in 2000 - in million ECU/EUR

	Total land transport (incl. pipel.)	Rail transport	Road transport	Water transport (marit. + iww.)	Air transport	Auxiliary transport activities
Bulgaria	405	:	306	:	:	117
Cyprus	:	:	:	:	:	:
Czech Republic	1 136	:	569	8	:	433
Estonia	125	:	:	42 ¹	6 ¹	261
Hungary	1 301	581	720	10	38	228
Latvia	256	:	:	2	11	350
Lithuania	255	:	:	42	8	152
Malta	39	0	39	37	217	237
Poland	:	:	:	92 ²	:	1 093
Romania	1 211	507 ¹	358	21	24 ²	352
Slovak Republic	403	:	83 ¹	10 ²	3 ²	85
Slovenia	363 ¹	130 ¹	233 ¹	3 ¹	24 ¹	210 ¹
Turkey	:	:	:	:	:	:

(1) 1999.
(2) 1998.

Source: Eurostat (Structural Business Statistics).

Table 4.15: Candidate Countries: Turnover per person employed in 2000 - in 1000 ECU/EUR

	Total land transport (incl. pipel.)	Rail transport	Road transport	Water transport (marit. + iww.)	Air transport	Auxiliary transport activities
Bulgaria	11.3 ²	:	:	:	:	17.8 ²
Cyprus	23.5	:	23.5	56.4	153.7	45.1
Czech Rep	28.1 ²	:	:	:	:	104.9 ²
Estonia	22.2	:	:	:	:	107.7
Hungary	22.8	13.8	30.1	21.8	129.4	69.2
Latvia	13.8	:	11.1 ¹	16.4	103.1	64.1
Lithuania	12.8	11.0 ²	16.5 ²	36.1	52.8	38.6
Malta	31.4	-	31.4	67.5	121.5	96.7
Poland	:	:	:	:	:	:
Romania	11.6 ²	:	10.7 ²	:	:	25.7 ²
Slovak Rep	11.6	:	17.7 ²	:	:	67.8
Slovenia	:	:	:	:	:	:
Turkey	:	:	:	:	:	:

(1) 1999.
(2) 2001.

Source: Eurostat (Structural Business Statistics).

Table 4.16 : Candidate Countries: Apparent labour productivity (value added/employment) in 2000 - in 1000 ECU/EUR

	Total land transport (incl. pipel.)	Rail transport	Road transport	Water transport (marit. + iww.)	Air transport	Auxiliary transport activities
Bulgaria	2.9 ³	:	:	:	:	:
Cyprus	15.5	:	15.5	28.1	51.2	33.4
Czech Rep.	4.9 ³	:	3.3 ³	:	:	14.0 ³
Estonia	5.6	:	:	:	:	25.1
Hungary	10.2	10.1	10.2	5.0	11.1	11.9
Lithuania	4.7	:	5.1 ³	18.1	5.7	12.3
Latvia	6.6	6.8 ³	5.3 ²	4.9	19.7	23.5
Malta	18.3	-	18.3	48.7	106.7	54.4
Poland	:	:	:	14.1 ¹	:	13.9 ¹
Romania	5.3	:	3.3 ³	3.2	5.8 ¹	10.3 ³
Slovenia	:	:	6.4	:	30.3	:
Slovak Rep.	5.4	:	5.8 ³	6.0 ¹	14.9 ²	11.9
Turkey	:	:	:	:	:	:

(1) 1998.

(2) 1999.

(3) 2001.

Source: Eurostat (Structural Business Statistics).

Table 4.17 : Candidate Countries: Investment per person employed in 2000 - in 1000 ECU/EUR

	Total land transport (incl. pipel.)	Rail transport	Road transport	Water transport (marit. + iww.)	Air transport	Auxiliary transport activities
Bulgaria	1.5	:	:	0.6 ¹	1.8 ¹	3.5 ¹
Cyprus	1.4	:	1.4	14.5	0.4	3.1
Czech Rep.	4.8 ¹	:	4.2 ¹	:	:	4.1 ¹
Estonia	2.1	:	:	:	:	6.8
Hungary	4.3	5.2	2.7	1.5	8.0	3.1
Lithuania	1.2	1.7 ¹	1.2 ¹	6.8	1.5	4.9
Latvia	3.8	:	1.7	12.2	9.7	10.4
Malta	0.2	-	0.2	3.6	4.6	3.5
Poland	:	:	:	:	:	:
Romania	2.1 ¹	:	2.0 ¹	:	:	2.9 ¹
Slovenia	:	:	:	:	:	:
Slovak Rep.	2.2	:	2.3 ¹	:	2.8	:
Turkey	:	:	:	:	:	:

(1) 2001.

Source: Eurostat (Structural Business Statistics).

5. Traffic and transport quantities and performances

5.1. Transport of goods

5.1.1. General development

The performance of the European transport sector has been in line with the expanding economy. As can be seen in Table 5.1, from 1970 to 2000 total European goods transport in the present 15 Member States, including intra-EU maritime transport, grew from 1 407 000 to 3 078 000 million tkm (119 %).

Noticeable increase only for pipeline transport and road haulage

Considering only inland transport, it appears that the considerable growth has been almost entirely realised by road transport. As far as the other modes of transport are concerned, only pipeline transport has substantially grown since 1970 (by 33%), but in 2000 this mode is accredited with a rather modest share of only 5 % of total inland transport (in tkm — see Graph 5.2). The picture is likely to change if only the tonnage would be considered (instead of the ‘weight-over-distance’ – as in Graph 5.2).

Remarkably enough, Graph 5.3 shows that the development of the two remaining modes of inland transport, namely railway and inland waterways, is less spectacular. Goods transport by railways even decreased (– 12% since 1970). Inland waterway transport progressed by only 22% in nearly three decades. It should however be noted that the efficiency of the latter transport mode made a big step forward since the transport performance was done with a considerably reduced vessel fleet (see Chapter 3 — *Means of transport*).

Table 5.1: Goods transport in EU-15 (1 000 million tkm)

	Road	Rail	Inland waterways	Pipelines	Sea (intra-EU)	Total
1970	487	282	102	64	472	1 407
1980	717	290	106	85	780	1 978
1990	974	256	107	70	922	2 329
1995	1 139	220	114	82	1 071	2 627
1997	1 206	237	118	82	1 124	2 768
1998	1 265	240	121	85	1 142	2 852
1999	1 322	236	121	85	1 197	2 960
2000	1 348	249	125	85	1 270	3 078
1970 - 80	47%	3%	4%	33%	65%	41%
1980 - 90	36%	-12%	1%	-18%	18%	18%
90 - 2000	38%	-3%	17%	21%	38%	32%
70 - 2000	177%	-12%	23%	33%	169%	119%

Estimates in italic.

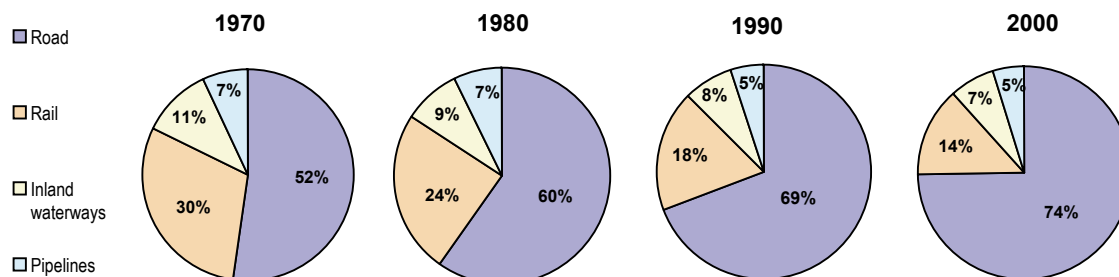
Note: 1970-1990 data include the former GDR.

Sources: DG Energy and Transport, Eurostat (pipelines), ECMT, UIC, national statistics. Sea transport 1999: gross estimate subject to revision.

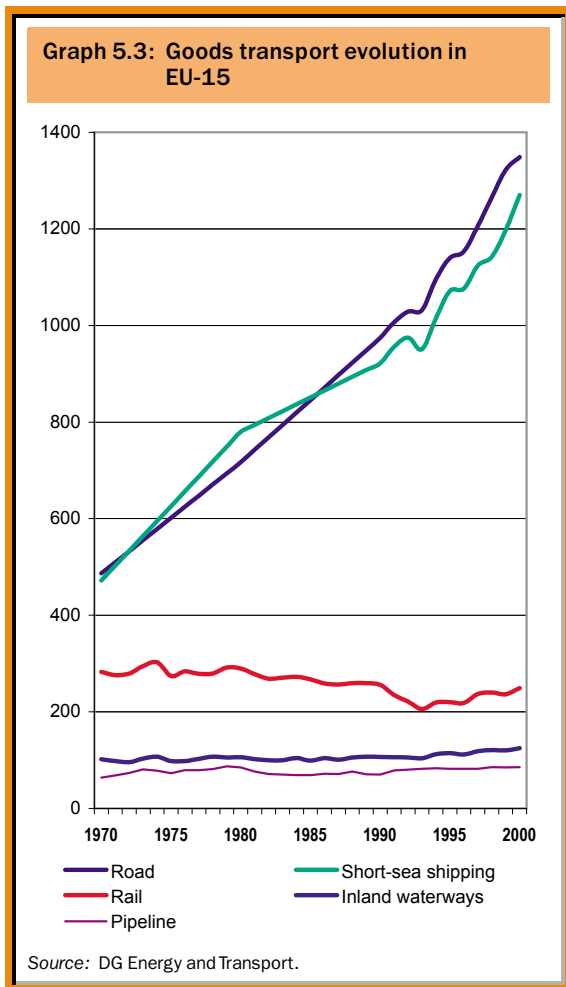
Short-sea shipping: fast growth in the 1970s

Maritime transport performance, restricted to intra-EU transport to allow a certain degree of comparison (data source: DG TREN), has mainly progressed during the 1970s (+65% between 1970 and 1980). In 2000, the number of tonne kilometres declared stands 169% over those of 1970.

Graph 5.2 : Goods transport: modal split of inland modes - EU-15 - Basis : tkm



Source: DG Energy and Transport.



The most important Member State with regards to inland waterway transport is traditionally the Netherlands; its extended inland waterway network and the geographical position on the

Table 5.4: Goods transport: modal split by country 2000 - in % based on tkm performed

	Road	Rail	Inland waterways	Pipelines
Belgium	67.5	16.0	13.1	3.4
Denmark	73.3	8.6	-	18.1
Germany	68.7	15.2	13.1	3.0
Greece	97.7	2.3	-	-
Spain	85.7	8.9	-	5.4
France	75.9	15.8	2.1	6.2
Ireland	93.0	7.0	-	-
Italy	88.0	8.2	0.1	3.7
Luxembourg	71.6	19.3	9.1	-
Netherlands	47.3	3.9	42.7	6.1
Austria	39.9	37.2	5.6	17.3
Portugal	87.1	12.9	-	-
Finland	72.5	26.5	1.0	-
Sweden	61.8	38.2	-	-
United Kingdom	84.1	9.7	0.1	6.1
EU-15	74.6	13.8	6.9	4.7

Source: DG Energy and Transport.

In 2000, for the European Union as a whole, 74 % of all inland transport was performed by road, 14 % by rail, 7 % by inland shipping and 5 % by pipelines. This modal split is based on the quantity of tonne kilometres hauled.

Goods transport by air has not been considered up to now since statistics on airfreight are only available in the number of tonnes handled at the reporting airports. Various figures relating to individual airports do however suggest a rapid growth, although the absolute volume remains low compared to the other transport modes.

Road haulage dominant, except in two countries — Table 5.4 outlines that for all 15 Member States — in the Netherlands and Austria by a relatively small margin — road transport is the main carrier of goods. In Greece, Spain, Ireland, Italy, and Portugal, it performed even more than 85 % of all inland transport.

Rail transport is taking care of more than a quarter of total transport in Austria, Finland and Sweden.

Rhine delta are no doubt responsible for a remarkably high share of well over 40 % of all performed tkm in 2000. In Belgium and Germany, inland shipping still accounts for a more than 10 % of total transport.

All figures and statistical information on the inland transport modes presented so far in this chapter, including the related tables and graphs are based on datasets that have been compiled by Directorate-General Transport and Energy according to the territoriality principle; i.e. transport performed on the territory of the country in question. Only this principle allows the establishment of the modal split indicators. Other datasets, based on detailed statistical declarations emanating from EU legal acts and compiled by Eurostat, have been used in the following chapters. This is particularly true for the international road transport datasets (presented in Chapter 5.1.3), based on the activities of hauliers registered in the declaring Member States and relating to transport performance both on the territory of the declarant country and

Table 5.5: Intra-European goods transport by relation and transport mode in 2000 - in 1000 tonnes

■ Railways¹
■ Road²
■ IWW³

Country of unloading	Country of loading															
	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	International intra-EU-15
Belgium	23902	1	3060	-	237	5366	-	2144	764	2296	269	0	-	204	189	14530
	315829	298	18512	3	948	25876	34	1452	1639	22963	493	93	16	201	1590	74118
	25451	5*	13195	-	-	3577	-	1*	33	36112	18	-	1*	-	2*	52944
Denmark	32	1646	612	-	3	132	202	3	7	77	-	10	664	0	-	1742
	568	206907	5371	2	292	690	30	461	10	1139	112	19	190	2149	130	11163
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	3656	421	193626	1	1107	4558	-	9660	1604	1806	7732	3	8	1111	50	31717
	19912	5796	2898779	142	4450	21359	85	11171	2292	32365	10920	613	84	1296	2214	112699
	12679	51*	60860	-	182*	8339	13*	5*	307	81898	589	2*	7*	27*	433*	104532
Greece	-	-	0	386	-	0	-	-	-	-	136	-	-	-	0	136
	7	5	155	203179	21	102	4	88	-	43	53	9	4	55	40	586
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	370	-	841	-	20734	608	-	65	50	2	17	202	-	5	169	2329
	1378	282	3926	2	907729	14470	49	2923	48	1675	268	4146	49	110	1236	30562
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	5641	53	4651	-	0	91111	-	1761	1060	1535	247	-	2	424	479	15853
	35470	698	20926	3	11473	1843560	115	9979	1605	8831	749	502	58	246	4740	95395
	4782	-	2392	-	-	26706	-	-	9	5398	34	-	-	-	2*	12617
Ireland	-	-	-	-	-	-	2680	-	-	-	-	-	-	-	-	-
	51	38	111	-	62	165	175414	47	-	67	3	3	-	-	9150	9697
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	3237	457	11123	-	82	6311	-	31546	238	1341	3721	0	-	816	703	28029
	1801	445	10827	81	2994	10747	42	1176437	164	1962	6448	463	23	102	1313	37412
	-	-	-	-	-	-	-	482	-	-	-	-	-	-	-	-
Luxembourg	4457	0	1220	0	0	287	7	-	2709	0	-	-	0	5	-	5976
	2681	30	2142	0	24	2175	2	93	19449	510	47	30	1	14	72	7821
	209	-	615	-	-	26	-	-	12	325	-	-	-	-	-	1175
Netherlands	2862	3	2401	-	24	450	-	943	121	5219	247	-	-	117	0	7168
	24645	759	32685	6	1322	6260	60	1295	346	464660	562	70	52	680	1475	70217
	19433	1*	25704	-	-	4275	-	-	85	100680	155	-	-	-	-	49653
Austria	517	36	8605	-	10	441	-	725	27	490	20239	-	0	242	2	11095
	475	111	14845	25	295	888	8	4239	53	846	241237	36	9	117	244	22191
	73	-	439	-	-	18	-	-	-	1254	1146	-	-	-	-	1784
Portugal	1	-	3	-	690	18	-	2	3	-	-	8069	-	-	0	717
	129	25	605	-	6710	847	-	653	11	134	75	103897	8	37	190	9424
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	6	15	147	0	0	16	0	45	16	6	10	-	24071	117	0	378
	4	151	65	-	78	49	-	32	-	82	1	3	415611	1509	-	1974
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweden	156	-	1111	-	-	-	-	202	-	75	99	-	116	19367	-	1759
	220	2002	1439	52	172	233	3	137	21	788	108	35	1860	322716	20	7090
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	28	-	102	-	-	439	313	6	52	114	39	-	7	-	95379	1100
	2296	172	2968	12	2059	6176	4087	1936	135	2366	305	238	1	23	1628099	22774
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
International intra-EU-15	20963	986	33876	1	2153	18626	522	15556	3942	7742	12517	215	797	3041	1592	122529
	89637	10812	114577	328	30900	90037	4519	34506	6324	73771	20144	6260	2355	6539	22414	513123
	37176	57	42345	0	182	16235	13	6	434	124987	796	2	8	27	437	222705

(1) On the basis of receipts (except for Sweden, where mirror declarations of dispatches to Sweden were taken). For international transport: DK, LU: 1992 ; UK: 1994 ; FR: 1997 ; EL, ES, PT: 1999.

For national transport: UK: 1994 ; IE: 1998

(2) Figures represent transport performed by vehicles registered in the individual Member States in 2000. Performance by Greek hauliers are excluded. International transport includes cross-trade. National transport (Greece: 1997) excludes cabotage.

(3) On the basis of receipts. For national transport: IT: 1992.

* Fluvio-maritime transport, consisting of transport operations partly on inland waterways and partly on the sea, without transshipment.

Source: Eurostat.

Table 5.6: Intra-EU goods transport by relation and transport mode in 2000 - share by transport mode

■ Railways¹
■ Road²
■ IWW³

Country of unloading	Country of loading															
	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	International intra-EU-15
Belgium	7%	0%	9%	0%	20%	15%	0%	60%	31%	4%	34%	0%	0%	50%	11%	10%
	86%	98%	53%	100%	80%	74%	100%	40%	67%	37%	63%	100%	94%	50%	89%	52%
	7%	2%	38%	0%	0%	10%	0%	0%	1%	59%	2%	0%	6%	0%	0%	37%
Denmark	5%	1%	10%	0%	1%	16%	87%	1%	41%	6%	0%	34%	78%	0%	0%	13%
	95%	99%	90%	100%	99%	84%	13%	99%	59%	94%	100%	66%	22%	100%	100%	87%
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Germany	10%	7%	6%	1%	19%	13%	0%	46%	38%	2%	40%	0%	8%	46%	2%	13%
	55%	92%	92%	99%	78%	28%	87%	54%	55%	28%	57%	99%	85%	53%	82%	45%
	35%	1%*	2%	0%	3%*	24%	13%*	0%	7%	71%	3%	0%	7%*	1%*	16%*	42%
Greece	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	72%	0%	0%	0%	0%	19%
	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	28%	100%	100%	100%	100%	81%
	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%
Spain	21%	0%	18%	0%	2%	4%	0%	2%	51%	0%	6%	5%	0%	4%	12%	7%
	79%	100%	82%	100%	98%	96%	100%	98%	49%	100%	94%	95%	100%	96%	88%	93%
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
France	12%	7%	17%	0%	0%	5%	0%	15%	40%	10%	24%	0%	3%	63%	9%	13%
	77%	93%	75%	100%	100%	94%	100%	85%	60%	56%	73%	100%	97%	37%	91%	77%
	10%	0%	9%	0%	0%	1%	0%	0%	0%	34%	3%	0%	0%	0%	0%	10%
Ireland	0%	0%	0%	-	0%	0%	2%	0%	-	0%	0%	0%	-	-	0%	0%
	100%	100%	100%	-	100%	100%	98%	100%	-	100%	100%	100%	-	-	100%	100%
	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	-	-	0%	0%
Italy	64%	51%	51%	0%	3%	37%	0%	3%	59%	41%	37%	0%	0%	89%	35%	43%
	36%	49%	49%	100%	97%	63%	100%	97%	41%	59%	63%	100%	100%	11%	65%	57%
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Luxembourg	61%	0%	31%	-	0%	12%	78%	0%	12%	0%	0%	0%	0%	26%	0%	40%
	36%	100%	54%	-	100%	87%	22%	100%	88%	61%	100%	100%	100%	74%	100%	52%
	3%	0%	15%	-	0%	1%	0%	0%	0%	39%	0%	0%	0%	0%	0%	8%
Netherlands	6%	0%	4%	0%	2%	4%	0%	42%	22%	1%	26%	0%	0%	15%	0%	6%
	53%	99%	54%	100%	98%	57%	100%	58%	63%	81%	58%	100%	100%	85%	100%	55%
	41%	0%	42%	0%	0%	39%	0%	0%	15%	18%	16%	0%	0%	0%	0%	39%
Austria	49%	24%	36%	0%	3%	33%	0%	15%	34%	19%	8%	0%	0%	67%	1%	32%
	45%	76%	62%	100%	97%	66%	100%	85%	66%	33%	92%	100%	100%	33%	99%	63%
	7%	0%	2%	0%	0%	1%	0%	0%	0%	48%	0%	0%	0%	0%	0%	5%
Portugal	1%	0%	0%	-	9%	2%	-	0%	21%	0%	0%	7%	0%	0%	0%	7%
	99%	100%	100%	-	91%	98%	-	100%	79%	100%	100%	93%	100%	100%	100%	93%
	0%	0%	0%	-	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Finland	60%	9%	69%	-	0%	25%	-	58%	100%	7%	91%	0%	5%	7%	-	16%
	40%	91%	31%	-	100%	75%	-	42%	0%	93%	9%	100%	95%	93%	-	84%
	0%	0%	0%	-	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	-	0%
Sweden	41%	0%	44%	0%	0%	0%	0%	60%	0%	9%	48%	0%	6%	0%	0%	20%
	59%	100%	56%	100%	100%	100%	100%	40%	100%	91%	52%	100%	94%	94%	100%	80%
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
United Kingdom	1%	0%	3%	0%	0%	7%	7%	0%	28%	5%	11%	0%	88%	0%	6%	5%
	99%	100%	97%	100%	100%	93%	93%	100%	72%	95%	89%	100%	13%	100%	94%	95%
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
International intra-EU-15	14%	8%	18%	0%	6%	15%	10%	31%	37%	4%	37%	3%	25%	32%	7%	14%
	61%	91%	60%	100%	93%	72%	89%	69%	59%	36%	60%	97%	75%	68%	92%	60%
	25%	0%	22%	0%	1%	13%	0%	0%	4%	61%	2%	0%	0%	0%	2%	26%

(1) On the basis of receipts (except for Sweden, where mirror declarations of dispatches to Sweden were taken). For international transport: DK, LU: 1992 ; UK: 1994 ; FR: 1997 ; EL, ES, PT: 1999.

For national transport: UK: 1994 ; IE: 1998

(2) Figures represent transport performed by vehicles registered in the individual Member States in 2000. Performance by Greek hauliers are excluded. International transport includes cross-trade. National transport (Greece: 1997) excludes cabotage.

(3) On the basis of receipts. For national transport: IT: 1992.

* Fluvio-maritime transport, consisting of transport operations partly on inland waterways and partly on the sea, without transshipment.

Source: Eurostat.

Table 5.7: Seaborne transport: gross weight of goods handled in all ports - in million t

	1997	1998	1999	2000	2001
Belgium	161.6	171.0	165.6	179.4	174.2
Denmark	124.0	105.0	97.2	96.5	94.0
Germany	213.3	217.4	221.6	242.5	246.1
Greece	101.3	110.5	112.5	127.7	112.5
Spain	270.6	280.3	295.7	234.9	315.1
France	305.1	319.0	315.2	336.5	318.2
Ireland	36.3	40.0	42.9	45.3	45.8
Italy	459.2	475.7	462.9	446.6	444.8
Netherlands	402.2	405.4	395.7	405.8	405.9
Portugal	54.7	57.6	58.8	56.4	56.2
Finland	75.3	76.6	77.5	80.7	96.2
Sweden	149.9	155.6	156.3	159.3	152.8
United Kingdom	558.5	568.5	565.6	573.1	566.4
EU-15	2 912.2	2 982.5	2 967.5	2 984.8	3 028.0

These figures do not exclude double counting (based on inwards+outwards)
Source: Eurostat.

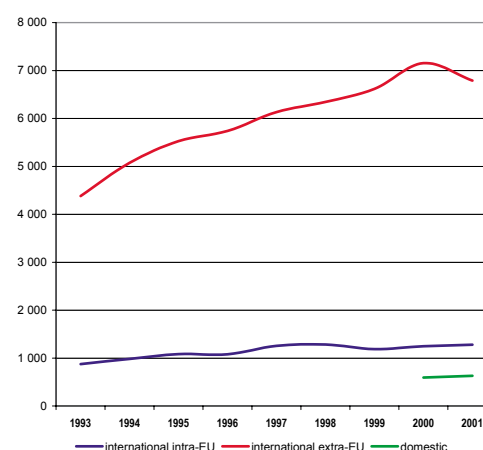
abroad. This 'nationality'-principle does not allow the establishment of modal split indicators.

The principle of declaration of activities by hauliers registered in the respective Member States also applies for the road transport performances of Tables 5.5 and 5.6. Table 5.5 is a matrix offering a complete survey of all possible intra-EU transport relations (expressed in tonnes) for rail, road and inland waterways for the year 2000. The geographical structure of European inland transport, as well as the relative importance of the three modes, can be made clear by a closer look to these statistics. For road transport for instance, the 18 512 000 tonnes loaded in Germany and unloaded in Belgium reflect the transport of :

- goods loaded in Germany by German hauliers and carried to Belgium (declaring country: Germany)
- goods loaded in Germany by Belgian hauliers and carried to Belgium (declaring country: Belgium)
- goods loaded in Germany and unloaded in Belgium by any EU-registered haulier other than German and Belgian (= cross-trade transport – up to 13 declaring countries, all except Germany and Belgium).

Table 5.6 is based on exactly the same information, but this time expressed as percentual share of each mode. The lower right cell reflects the share of the various inland transport modes at EU level (for intra-EU transport only). In this cell the relative importance of inland waterways (share of 26%) might be

Graph 5.8: Evolution of EU air freight and mail transport (in 1000 t)



Source: Eurostat.

surprising, but it is recalled that the information is based on the volume in tonnes and not on weight-over-distance (tkm). It is the weight of the Netherlands (with 125 million tonnes, it accounts for some 56% of the entire volume carried on inland waterways in intra-EU goods transport) that makes the EU average go up.

The diagonal cells outline the national transport volume. It should be noted that national road transport excludes cabotage. Data on cabotage are only available in tonne-kilometres.

Furthermore, with regards to inland waterway transport, certain country pairs might appear unrealistic, like for instance the 433 000 tonnes loaded in the UK and unloaded in Germany. Such cases concern so-called 'fluvio-maritime' transport, consisting of transport operations partly on inland waterways and partly on the sea, without transshipment, with a vessel registered as a seagoing vessel.

Over 3000 million tonnes handled in EU-15 ports in 2001

Not comparable with the transport performance of the other modes due to the fact that tkm figures are not yet available, Table 5.7 displays the total volume (in tonnes) of goods (thus not restricted to intra-EU short-sea shipping) handled in all maritime ports of the EU. Since Eurostat's data collection on maritime transport is relatively recent, data are only available for the period 1997-2001. It should also be noted that double counting is not excluded in the figures presented, thus the actual maritime transport is overestimated. The total volume of goods handled

in 2001 could be established at 3 028 million tonnes of goods. This represents an increase of 1.4 % compared to 2000 and 4% compared to 1997. Overall, 66% of the total was cargo unloaded and 34% loaded. Whereas Ireland registered a considerable growth in the volumes handled (26% on the period covered) a noticeable decline was experienced in Denmark (-24 %), where ferry traffic on various routes has been substantially reduced following the opening of fixed links (tunnel/bridges) and coal transport noticeably decreased. Between 2000 and 2001, Finland and Spain registered the most substantial increase with 19% and 34% respectively. These increases can be explained by the fact that Finland started to declare national transport for the first time in 2001 and Spain included more

ports (Algeciras, Castellon de la Plana, and Pesajes) in their declaration. The latter element alters the comparison with the previous years and has an influence on the EU total.

Faster growth of extra-EU air transport

Compared to the 3 000 million tonnes handled in maritime transport, the volumes of freight and mail transport by air are obviously low. Graph 5.8 shows that international extra-EU air transport increased substantially faster than international intra-EU transport until 2000. International extra-EU air transport registered a substantial decrease in 2001, while international intra-EU transport only slowed down its increasing trend. Domestic air transport of freight and mail kept constant in 2001 compared to 2000.

Candidate Countries

As for the European Union, data for the Candidate Countries are currently available in different measurement units (tonne-kilometres or tonnes), depending on the mode of transport considered. This explains why road, rail, inland waterways and pipeline data, all expressed in tonne-kilometres, will not be treated alongside the air and maritime transport data, both expressed in tonnes.

Table 5.9 highlights the evolution of the first group of modes previously mentioned. It outlines that road transport is, in absolute terms, responsible for almost the entire progression of the total transport performance (four modes). In relative terms, pipelines are the mode of transport offering the most important increase over the period observed and it should be noted that its share in the total is higher than for the European Union (13%). During the period covered, rail transport is the only mode that registered a decrease (-16%). Between 2000 and 2001 alone, data suggest a loss in transport performance of 7%.

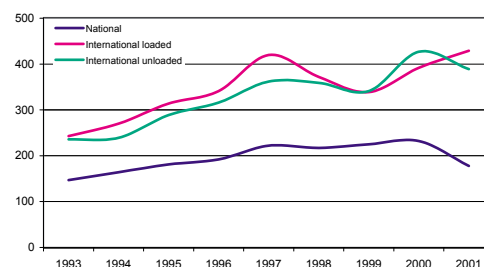
In 2000, Turkey accounted for more than 75% of the total freight transport by air registered by the various candidate countries. Due to Turkey's weight, the evolution of the freight transport presented in

Table 5.9: Goods transport in the Candidate Countries (1 000 million tkm)

	Road	Rail	Inland waterways	Pipe-lines	Total
1993	223	173	6	24	425
1994	249	169	6	31	455
1995	296	178	9	31	514
1996	309	177	9	35	531
1997	335	179	10	51	575
1998	346	161	10	74	590
1999	346	148	7	77	578
2000	353	156	7	77	592
2001	352	145	7	73	577
1993-2001	58%	-16%	21%	204%	36%
2000-2001	0%	-7%	-1%	-5%	-3%

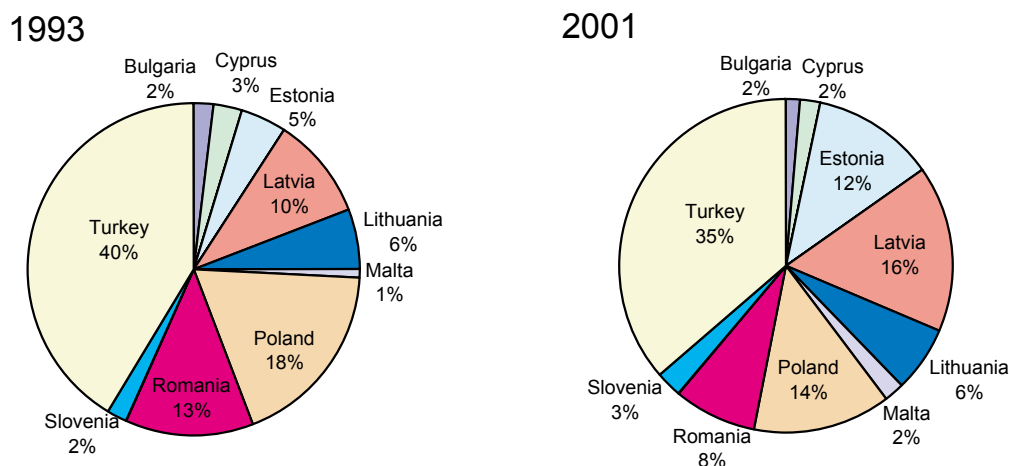
Estimates in italic.
Source: Eurostat.

Graph 5.10: Evolution of the freight transport by air (national, international)



Estimates have been used for missing data.
The international figures do not exclude double counting between the Candidate Countries.
Source: Eurostat.

Graph 5.11: Evolution of the share of each candidate country in the volume of freight carried in maritime transport



RO: Due to data availability, 1996 data have been used for the 1993 graph.
Source: Eurostat.

the curves of Graph 5.10 actually reflects more the evolution of the figures declared by Turkey, as the fluctuations of this country «cover» the fluctuations of the other candidate countries. However, it can be noticed that there has been a clear upward trend between 1993 and 1997 for all types of air transport, but stagnation between 1997 and 2001. The international freight loaded is actually the only transport type to increase between 2000 and 2001 (9.4%) while the international freight unloaded and the national transport decreased by 8.9% and 23.3% respectively.

The evolution of the share of each country in maritime transport in the candidate countries is given in Graph 5.11. Estonia and Latvia are the two countries registering the most important progress in terms of share in the total transport with respectively 5% and 10% in 1993 and 12% and 16% in 2001. The opposite is true for Poland and Romania (1996 data used for the 1993 chart for the latter country) where the share decreased respectively from 18% and 13% to 14% and 8%. Turkey, with its long coastline, has the most important share with 35%, although it represents a sensible decrease compared to 1993 (40%).

EFTA countries

The trend in the EFTA is clearly visible in Table 5.12 for rail and road transport, despite the lack of data. Rail transport registers a decline while road transport increases significantly during the period covered for all the countries.

Table 5.12: Evolution of road and rail transport of goods in EFTA countries (million tkm)

		1995	1996	1997	1998	1999	2000	2001
Rail	Norway	2 715	2 636	2 399	2 421	2 456	2 451	:
	Switzerland	8 796	7 957	:	:	:	:	:
Road	Iceland	:	:	506	523	562	591	608
	Norway	9 654	12 467	14 064	14 755	15 094	12 483	:
	Switzerland	:	:	15 403	16 921	17 693	18 782	:

N.B.: Provisional data.
Source: Eurostat.

5.1.2. National goods transport

The amount of national transport is largely dependent on the industrial and commercial development of the countries concerned.

Disregarding pipelines (restricted to liquid oil products), there are significant differences between Member States, as far as the division among the different modes of transport — the so-called 'modal split' is concerned.

Dominant position of road haulage unchanged

Table 5.13 indicates that for the European Union as a whole, in 1995 road haulage accounted for 10 191 million tonnes of national transport; this stands out in contrast to only 573 million tonnes for rail transport and about 206 million tonnes for inland navigation. Figures for 2001 show that the volume (in tonnes) of road transport progressed slightly at EU level (estimated at 11 010 million tonnes – an increase of just over 8%). Increases were highest in Ireland, Spain and France. Conversely, Belgium is the country that displays a decline in volumes forwarded. It should however be noted that the 2000 and 2001 figures are based on new road sample surveys, which might slightly affect the comparability with the years prior to 1999.

When comparing the 2001 rail transport volume figures with those of 1995, a decrease at EU-15 level can be observed (estimated at –10.3%).

Greece and Denmark display a clear drop in the number of tonnes forwarded whereas the opposite is true for Austria.

Less tonnes but over longer distance

However, if performance of road versus rail is measured in tonne kilometres (see Table 5.14), the modal split shows different proportions: in 1995, road transport was responsible for 857 000 million tkm and rail for 121 000 million tkm of national transport. In other words, railways represented 5.6% of the volume, but for 14.1 % of the tkm performance of road haulage. For 2001, these figures can be estimated at 4.7% and 14.2% respectively. As for the data expressed in tonnes, the 2000 and 2001 road data are based on new sample surveys, which could affect comparability with previous years.

Expressed in tkm, it appears that in the period 1995-2001, the progress in road transport performance is quite substantial. At EU-level, the number of tkm increased by 16.3%. Except for Portugal, Luxembourg and Sweden, national road transport increased in all Member States, especially in Ireland, Spain and Belgium.

Rail transport, displaying a decrease in the number of tonnes forwarded (– 10.3 %), increases when expressed in tkm (+ 4.5 %). Figures suggest that Greece, Denmark and Belgium registered the most important decline in

Table 5.13: National transport of goods by country and mode - in 1 000 tonnes

	1985			1990			1995			2000			2001		
	Road (1)	Rail (2)	Inland waterways (3)	Road (4)	Rail	Inland waterways	Road (5)	Rail (6)	Inland waterways (7)	Road (8)	Rail (9)	Inland waterways	Road	Rail	Inland waterways
Belgium	265 386	34 425	21 436	276 869	30 228	21 134	352 047	27 198	18 064	315 830	23 902	25 451	291 739	22 788	:
Denmark	199 932	2 348	-	194 452	2 137	-	175 949	2 238	-	206 907	1 646	-	189 997	1 576	-
Germany	2 213 709	238 937	63 720	2 715 148	217 187	62 600	3 019 144	232 836	72 334	3 058 994	193 626	60 860	2 934 972	189 632	57 016
Greece	158 371	1 198	-	176 594	898	-	178 794	575	-	203 176	334	-	:	341	-
Spain	913 337	25 024	-	973 707	22 428	-	588 151	20 948	-	907 734	20 734	-	1 006 083	20 845	-
France	1 197 942	114 290	30 457	1 404 050	98 502	32 873	1 324 143	80 817	25 171	1 843 606	88 912	26 703	1 915 969	80 905	24 775
Ireland	89 731	3 379	-	78 952	3 277	-	78 531	3 015	-	175 413	2 680	-	185 640	:	-
Italy	327 555	17 219	1 600	889 064	21 084	739	1 220 917	27 425	606	1 176 437	31 546	:	1 125 468	30 495	:
Luxembourg	11 127	2 540	23	24 032	2 816	40	28 437	2 702	14	19 448	:	12	23 440	2 742	21
Netherlands	338 658	5 527	70 101	386 936	4 972	84 032	391 766	4 349	89 054	464 660	5 219	100 682	470 372	4 363	104 741
Austria	:	:	:	:	:	:	219 616	15 980	522	241 239	20 239	1 146	244 479	20 143	1 207
Portugal (10)	190 554	4 688	-	237 946	5 389	-	263 198	7 628	-	103 898	8 288	-	127 174	8 138	-
Finland	:	:	-	:	:	-	349 128	21 874	-	415 611	24 071	-	372 887	23 992	-
Sweden	:	:	-	:	:	-	343 209	29 741	-	325 063	19 367	-	306 307	:	-
United Kingdom	1 407 000	139 326	-	1 686 998	137 622	-	1 658 408	95 379	-	1 628 099	:	-	1 612 072	:	-
EU-15	:	:	:	:	:	:	10 191 438	572 705	205 765	11 086 115	:	:	:	:	:

Estimates in italics

(1) E, I: 1986 ; P: 1987 (2) E, P: 1986 (3) L: 1986 (4) L: 1992 (5) IE: 1993 (6) L: 1992, IE, UK: 1994 (7) L: 1992, I: 1993 (8) EL: 1997 ; (9) F, IE : 1998, EL, PT, SE: 1999 (10) Portugal did not declare 'own account' road transport for 2000 and 2001, explaining the serious drop in tonnage between 1995 and 2000

Source: Eurostat.

Table 5.14: National transport of goods by country and mode - in million tkm

	1985			1990			1995			2000			2001		
	Road (1)	Rail (2)	Inland waterways	Road (3)	Rail	Inland waterways	Road (4)	Rail (5)	Inland waterways (6)	Road (7)	Rail (8)	Inland waterways	Road	Rail	Inland waterways
Belgium	10 379	2 537	1 676	12 616	2 629	1 698	18 616	2 231	1 414	19 754	2 031	2 391	24 045	1 904	:
Denmark	8 343	609	-	9 354	568	-	9 327	448	-	11 000	456	-	10 887	362	-
Germany	98 615	37 798	12 961	:	33 092	14 109	201 299	35 710	17 153	226 529	35 038	13 347	220 061	34 556	11 769
Greece	10 353	289	-	12 485	222	-	12 357	155	-	19 322	112	-	:	107	-
Spain	74 144	8 793	-	69 924	8 750	-	78 744	7 992	-	106 936	9 587	-	114 002	9 775	-
France	79 093	37 494	4 505	118 200	33 482	4 267	135 300	28 797	3 149	163 163	32 815	4 140	168 586	29 874	3 595
Ireland	3 727	601	-	3 878	589	-	5 000	602	-	8 337	424	-	9 009	:	-
Italy	98 443	7 095	202	115 786	9 088	118	150 301	10 606	95	158 250	11 789	:	154 746	11 019	:
Luxembourg	205	86	:	:	113	1	531	104	1	415	101	0	487	98	1
Netherlands	18 189	1 064	6 356	22 581	1 020	6 896	26 683	721	6 888	31 538	945	9 631	30 954	839	9 735
Austria	:	:	:	:	:	:	11 069	3 001	84	12 389	3 892	117	11 348	3 875	94
Portugal	8 636	1 135	-	10 978	1 283	-	11 119	1 767	-	15 312	1 872	-	9 520	1 834	-
Finland	:	:	-	-	-	-	21 804	5 936	-	27 717	6 802	-	26 680	6 588	-
Sweden	:	:	-	-	-	-	28 357	10 432	-	31 451	12 420 (9)	-	26 615	12 501 (9)	-
United Kingdom	100 541	16 811	-	132 968	16 078	-	146 714	12 440	-	150 337	:	-	:	:	-
EU-15	:	:	:	:	:	:	857 221	120 942	28 784	982 450	:	:	:	:	:

(1) E, I: 1986 ; P: 1987 (2) E, P: 1986 (3) L: 1992 (4) IE: 1993 (5) S: 1996 ; UK: 1994 (6) I: 1993 (7) EL: 1998 (8) IE: 1998 (9) 2000-2001 "Banverket 2003"

Source: Eurostat.

Estimates in italics

performances whereas Austria, Spain and Sweden show a progress of 29%, 22% and 20% respectively.

Topographic features influence 'modal split'

It is obvious that average distances for road and rail in national transport are very different: Graph 5.15 shows that only 10 % of the volume of goods (expressed in tkm) forwarded by rail have a distance of up to 150 km. The equivalent number for road haulage is 32%. This shows the flexibility of road transport for shorter distances and the

relative importance of rail for longer distances. It should however be noted that certain Member States (Belgium, Ireland, Luxembourg and the Netherlands) are not able to perform national journeys of more than 500 km. If national rail transport is to be promoted within the framework of 'intermodality', it is clear that this will mainly be appropriate for 'larger' Member States like Germany, France or the United Kingdom. This can be illustrated by the share of national rail transport, as a percentage of road haulage (in tkm) in some Member States (2001): 31 % in Sweden, 25 % in Finland and 19% in France and Portugal. Certainly influenced by the topographic features of the country, Austria's share is also high (31 %).

Cabotage transport

Apart from the 'traditional' national transport, cabotage transport (transport taking place on the territory of a country but performed by hauliers registered in another country) can also be considered as national transport from the point of view of the movements of goods. 'Traditional' national transport is based on the transport performance declared by the Member States for their own territory and hauliers registered in their country. Cabotage is declared by Member States for hauliers registered in their country that performed transport on the territory of another country. Thus, from the point of view of the reporting country, cabotage is considered as international transport. Further details on cabotage transport can be found in the following Chapter 5.1.3 *International goods transport*.

Rotterdam 'feeds' extensive Dutch inland waterways

In the Netherlands national rail transport remains extremely low: only 3 % of road haulage in 2001; but this is certainly connected with the strong competition of inland navigation, which has the biggest share of all Member States. This high share is certainly due to the important role of the port of Rotterdam, acting as location for redistribution to Europe.

A different situation occurs in Belgium; although one of the 'smaller' Member States, rail is, in 2001, responsible for 9 % (1985: 24 %) of the volume of national road haulage. Traditionally, Belgian railways have had a relatively strong position both in national and international goods transport.

Table 5.16: Volume of freight and mail carried in domestic air traffic in 2001 - in tonnes

	Main airport in domestic air transport		
	tonnes	Airport	share
Belgium	537	Bruxelles/National	100%
Denmark	620	Aarhus/Tirstrup	60%
Germany	189 229	Frankfurt/Main	32%
Greece	:	:	:
Spain	119 822	Madrid/Barajas	33%
France	218 152	Paris/Charles-De-Gaulle	31%
Ireland	5 960	Shannon	54%
Italy	:	:	:
Luxembourg	-	-	-
Netherlands	83	Amsterdam/Schiphol	63%
Austria	748	Wien/Schwechat	48%
Portugal	24 265	Lisboa	55%
Finland	6 370	Helsinki	44%
Sweden	:	:	:
United Kingdom	62 916	Belfast/Aldergrove	25%

Source: Eurostat.

Table 5.17: National seaborne transport in the main ports 1997 - 2001, in 1000 tonnes

	1997	1998	1999	2000	2001	2001 - as share in total seaborne transport (%)
Belgium	4 197	4 001	4 520	5 074	4 516	2.6
Denmark	24 316	15 530	10 500	11 149	13 580	18.6
Germany	5 356	5 219	7 454	5 246	4 794	2.0
Greece	43 787	43 978	45 078	29 088	31 981	32.0
Spain	:	:	:	46 681	46 374	18.4
France	:	20 499	18 367	18 678	18 908	6.3
Ireland	774	1 008	810	1 385	1 272	3.4
Italy	74 557	67 404	64 713	58 761	56 863	15.0
Netherlands	576	545	869	778	:	:
Portugal	5 499	6 285	6 370	5 489	5 619	11.1
Finland	:	:	:	:	5 664	6.7
Sweden	13 286	13 903	12 597	12 068	11 815	9.3
United Kingdom	:	:	:	64 424	106 856	21.3

Source: Eurostat.

Diagonally across the EU: Rhine and Danube

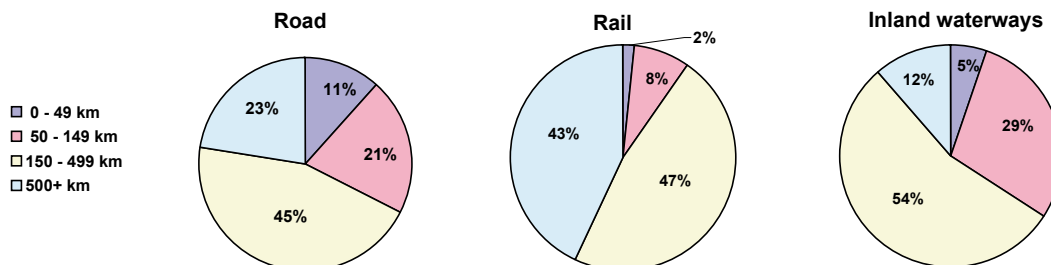
At national level, only four Member States have a substantial amount of inland waterway transport: Belgium, Germany, France and the Netherlands. Of course this situation is strongly determined by the geographical position: the Rhine and its delta may be regarded as the most important inland waterway network in the world, connecting important industrial areas and seaports.

The Netherlands, although a relatively small Member State, has the highest volume of national waterway transport of Europe (when expressed in tkm), which in 2000 was about 10 times higher than Dutch national rail transport. Figures in

Tables 5.13 and 5.14 show that in Belgium and Germany inland waterways are of considerable importance for national transport; both countries featuring a rather extended and connected inland waterway network. In France, the importance of inland navigation is more limited and restricted to some separated networks. The volume (in tonnes) and the transport performance (in tkm) seems to stagnate between 1999 and 2000, after having registered an important progression between 1998 and 1999.

Although the increase of national waterway transport in the Member States concerned

Graph 5.15: National goods transport by distance class, on the basis of tkm forwarded



NB: Data according to the most recent year available - Rail: without L, UK; inland waterways: countries considered: B, D, F, L, NL, A.
Source: Eurostat.

cannot possibly match the development of road haulage, national transport by navigable waterways remains stable.

Intercontinental air transport can be 'domestic' —

Domestic air transport is quite limited or non-existing in smaller Member States. Larger Member States and those featuring important islands display however noticeable volumes in air freight and mail. Table 5.16 shows that on the basis of data available, it appears that France, with Corsica but also the overseas territories like Martinique, Guadeloupe and French Guyana features the highest volume of domestic air freight, (218 thousand tonnes). Germany comes second, followed by Spain (with the Balears and the Canary Islands) with 189 000 and 120 000 tonnes respectively. Furthermore, the table also displays the airport that takes the highest share in domestic air freight and mail transport.

Storebælt fixed-link make Danish figures drop —

In some ways, the situation of seaborne transport is similar. At the level of the EU, about 310 million tonnes of goods have been handled during the year 2001 in the main ports in national transport. Table 5.17 shows that the United

Kingdom, Italy, Spain and Greece are the countries that display the highest volumes. But it is the share of national transport in total seaborne transport that appears to be more interesting information: more than 30 % of the tonnage handled in Greek ports had national origin and destination. United Kingdom, Denmark and Spain followed with a share of 21 %, 19 % and 18 % respectively. The geographical features of the above mentioned countries (islands, either large in number or only a few but important ones, or a country with a very important coastline) largely explain this relatively high share.

For Denmark, the substantial drop of the national share during the observation period is notably influenced by the discontinuation of important ferry services after the opening (in 1998) of the Storebælt fixed link, enabling to reach Sjælland (with Copenhagen) via the island of Fyn without having to take a ferry.

The sharp increase between 2000 and 2001 registered for the United Kingdom can be explained by the fact that the latter year takes into account transport to offshore installations, whereas this was not the case in the previous year.

Candidate countries

A general overview of the national transport of goods in the candidate countries is given in Table 5.18 for the main inland modes. Rail transport of goods has registered a clear decline in all the candidate countries, especially in Slovenia and the Czech Republic, with -50% and -44% respectively. However, rail transport performance remains high in some countries like Poland (34 287 million tkm) and Romania (12 760 million tkm). For the latter country, as well as for Bulgaria and Estonia, the goods transport performance of rail (expressed in tkm) is significantly higher than that of road.

At the opposite of rail, the general trend is the increase of goods transport by road. Two countries alone account for about 80% of the total national goods transport in the candidate countries group: Turkey, with 151 400 million tkm (61%) and Poland, with 46 365 million tkm (19%). The Slovak Republic registered the most important progression with +390% between 1993 and 2000, followed by the Czech Republic with +215%. The opposite is true for Bulgaria, with a decline of 76% on the same period.

Inland waterways and oil pipelines shares are of minor importance compared to rail and road transport. However, it is noticeable that Romania alone (with the Danube estuary and maritime/inland waterway transshipment facilities) accounts for 83% of the total inland waterways transport performed in the candidate countries, while Turkey takes the lion's share in oil pipelines with 70%, representing a volume of 3 100 million tkm performed.

Table 5.18: Candidate countries: national freight transport by mode (million tkm)

	Rail			Road			Inland waterways			Oil pipelines		
	1993	2001	Evolution 1993-2001	1993	2001	Evolution 1993-2001	1993	2001	Evolution 1993-2001	1993	2001	Evolution 1993-2001
Bulgaria	6 543	4 139	-37%	13 989	3 310	-76%	1	2	100%	307	339	10%
Cyprus	-	-	:	:	:	:	-	-	:	-	-	:
Czech Republic	12 570	7 091	-44%	5 105	16 082	215%	487	23	-95%	-	-	:
Estonia	877	726	-17%	502	548	9%	0	-	:	-	-	:
Hungary	2 457	1 967	-20%	9 224	11 848	28%	28	5	:	192	142	-26%
Latvia	534	390	-27%	:	1 645	:	1	-	:	-	-	:
Lithuania	:	1 522	:	:	1 518	:	49	1	-98%	-	-	:
Malta	-	-	:	:	:	:	-	-	:	-	-	:
Poland	52 046	34 287	-34%	37 340	46 365	24%	143	318	122%	:	:	:
Romania	15 908	12 760	-20%	13 349	10 645	-20%	1 066	1 755	65%	753	856	14%
Slovak Republic	:	2 207	:	1 085	5 318	390%	0	-	:	-	-	:
Slovenia	497	249	-50%	298	216	-28%	-	-	:	-	-	:
Turkey	8 118	7 149	-12%	97 843	151 421	55%	-	-	:	3 082	3 082	0%

Estimates in italic.

Bulgaria Inland waterways: only public sector enterprises. Road: figure for 1993 is an expert estimate; thus limited comparability with 2001.

Hungary Inland waterways: 1993 and 2001 data not comparable: 1993 data includes the transport of materials excavated from iww (sand, gravel, etc.). Normally, and according to EU Directive 1119/80, this should be excluded.

Latvia Oil pipelines: all oil and oil products included, where transited from Russia to Lithuania or via port to other third countries.

Lithuania: Inland waterways: including ferries.

Slovakia: Road: data consist of transport enterprises (NACE 60.2, excluding 60.21 and 60.22). 1993 1999: only organisations registered in the business register are included. 2000 2001: all organisations and tradesmen are included. Inland waterways: includes sea transport.

Slovenia: Road: only transport for "hire or reward" is taken into account. Both cabotage and cross-trade included.

Source: Eurostat.

EFTA countries

Rail transport performance figures for both Norway and Switzerland suggest that the decreasing trend previously observed for the candidate countries is also applicable here. Norway and Switzerland registered declines of respectively -17.4% (between 1993 and 2000) and -10.4% (between 1993 and 1996).

Table 5.19: EFTA countries: national freight transport by rail (million tkm)

	1993	1994	1995	1996	1997	1998	1999	2000
Norway	2 408	1 599	2 242	2 164	1 949	1 934	1 961	1 988
Switzerland	2 491	2 476	2 355	2 231	:	:	:	:

Source: Eurostat.

5.1.3. International goods transport

The globalisation of the economy and especially the increasing integration of the European economies have led to a considerable growth of the entire transport sector. Currently being deregulated, especially within rail transport, the sector is expected to increase efficiency and thus experience further growth.

European transport statistics, as provided by Eurostat, illustrate the structure and development of international European transport for all modes of transport over the years. This chapter highlights the developments of the last decade.

In 2001, international goods movements of Member States amounted to approximately 296 000 million tonne kilometres (tkm) for road (without cross-trade and cabotage transport), 89 000 million tkm for rail and 71 000 million tkm for inland waterways. Compared to 1990, this represents an increase of around 62% for international road transport, 18% for rail transport and 15% for transport over navigable inland waterways.

General structure of transport quite heterogeneous

The territory of the European Union includes several highly industrialised and densely populated areas; both are generating considerable inland transport flows of raw materials, final products and foodstuffs.

Many of the materials and products are imported by sea; in connection with their transshipment in European seaports (like Rotterdam, Antwerp, Marseille, Hamburg or Le Havre), they have to be carried to their destinations within Europe by the different modes of inland transport.

On the other hand, an opposite stream of goods is moving towards the seaports for export to overseas. These flows of transport between the seaports and their hinterland, by road, rail and inland waterways, are providing a substantial contribution to inland transport in Europe. However, there are considerable differences in the

size of transport between the respective Member States, as well as in the modes to be used.

Rhine axis most important for the Netherlands and Germany

The importance of a particular mode is different for individual Member States. For some, like the Netherlands, Germany and Belgium, inland navigation is a very significant mode of international transport (see Table 5.20).

Consequently, the most important transport flows for inland shipping are to be found in the northwestern European area. Germany, France and the Benelux countries generate the most important part of inland shipping in the European Union. A considerable part of these goods is transhipped in the big seaports, like Rotterdam, Antwerp or Hamburg.

Noticeable is also Austria's navigable waterways, with the Danube offering a major transport corridor to central European countries down to the Black Sea Coast.

Rail: strong position in Scandinavia

Although at EU-level railways are taking care of only a minor part in total international transport, the importance of this mode is substantial for some Member States; railways carry substantial volumes in international transport in Sweden and Finland. The modal comparison in international goods transport throughout the Member States is impossible due to the fact that road transport declarations include transport performed outside the country where hauliers are registered whereas the territorial principle applied to transport performance declarations of rail and inland waterways. Furthermore, Italy for instance has no inland waterway connection with any other Member State; international goods transport by rail for the United Kingdom became only possible with the opening of the Channel tunnel. The Republic of Ireland records rail goods transport to and from Northern Ireland as national traffic.

Table 5.20: International transport by inland waterways - loaded and unloaded (million tkm)

	1990	1995	1996	1997	1998	1999	2000	2001	Change 1990 - 2001 (%)
Belgium	3 264	3 932	3 857	3 878	3 966	3 995	4 322	:	:
Germany	31 952	34 998	34 466	35 693	36 660	35 281	38 358	37 255	17
France	2 895	2 575	2 352	2 530	2 743	2 715	3 112	3 118	8
Luxembourg	7	:	6	28	35	7	8	8	14
Netherlands	22 739	22 551	22 607	25 973	24 939	23 988	23 765	25 163	11
Austria	:	943	1 077	1 030	1 079	1 152	1 199	1 204	:

Source: Eurostat.

Table 5.21: International rail transport - loaded and unloaded (million tkm)

	1990	1991	1995	1996	1997	1998	1999	2000	2001	change 1990-2001 (%)
Belgium	4 954	4929	4 648	4 336	4 785	4918	4978	5419	4895	-1.2
Denmark	569	630	602	570	706	671	608	699	657	15.5
Germany ¹	22 127	22984	25 384	25 118	26 414	27755	27161	32875	32016	39.3 ²
Greece	411	373	147	194	194	196	244	311	268	-34.8
Spain	1 381	1365	1 761	1 990	2 269	2148	1944	2027	1942	40.6
France	12 983	12802	13 804	14 351	15 741	13563	13740	15026	14007	7.9
Ireland	-	-	-	-	-	-	-	-	-	-
Italy	10 141	10840	11 065	10 607	11 370	11006	10435	10946	11091	9.4
Luxembourg	419	408	:	:	:	:	:	262	263	-37.2
Netherlands	2 016	2017	2 295	2 386	2 621	3030	3110	3577	3454	71.3
Austria	:	:	6 884	7 159	7 769	8025	8067	9096	9191	33.5 ³
Portugal	156	171	252	250	395	410	318	311	304	94.9
Finland	:	:	3 357	3 107	3 598	3572	3373	3305	3269	-2.6 ³
Sweden ⁴	:	:	8 313	7 276	7 487	7261	7054	7668	7047	-15.2 ³
United Kingdom	193	192	:	:	:	:	:	:	:	:

(1) Data for 1990 exclude ex-GDR; (2) 1991-2001; (3) 1995-2001

(4) Data for Sweden have been received from Banverket

Source: Eurostat.

Germany by far first in rail transport performance

In absolute terms, Germany performed in 2001 close to 32 000 million tkm in rail goods transport, considerably ahead of France and Italy with 14 000 million (1998) and 11 000 million tkm respectively (see Table 5.21). In relative terms, Portugal's volume of international rail transport doubled between 1990 and 2001, whereas Sweden's transport recorded a decline of 15 %. In Greece, the conflicts in the former Yugoslavia affected one of the main lines for international freight transport (from Thessaloniki to the border town of Idomeni), explaining the strong decrease in the period 1994-1997. Rail figures display a considerable increase again for 2000-2001, without however reaching the transport performance level of the early 1990s.

Transshipment often needed in Spain

Although there is no competition from inland shipping, rail transport from and to Spain appears remarkably low (1 942 million tkm in 2001). This may be a statistical anomaly caused by the very specific situation at the border with neighbouring France, where as a consequence of the different rail gauge in Spain, transshipment from one railway wagon to another is inevitable in many cases, so that movements of goods across the border are not included in international transport. Although a growing number of adaptable wagons are available, road haulage is still responsible for a large part of Spanish international goods transport. Additionally, as important industrial centres are located close to the French border in Spain, the reported tonne-kilometres (according to the territorial principle) are not very important.

Road: plus 62% between 1990 and 2001

In 2001, the international goods transport by road at EU-level amounted to approximately 296 000 million tkm. This represents an impressive increase in volume of over 62% in a little more than a decade (1990-2001). Its volume is three times as big as international rail transport and nearly four times that of inland shipping.

Table 5.22 shows that the Member States with the most voluminous international road haulage in 2001 were Germany (52 150 million tkm), Spain (45 323), the Netherlands (37 470) and France (35 917). The port of Rotterdam, where goods are unloaded from ships and often continue their journey by lorry, can partly explain the surprisingly high international transport performance of hauliers registered in the Netherlands.

Cross-trade initially under quota system

All data and related comments on road transport in the previous sections of this chapter apply to 'regular' international road transport: reporting countries declaring international road transport (loaded or unloaded in the reporting country) by hauliers registered in their respective country. Road transport is however more important than suggested in the previous paragraphs since cabotage and cross-trade transport are also categories of road transport

Cross-trade road transport (international road transport, carried out by vehicles neither registered in the country of loading, nor in the country of unloading) was, before 1993, only allowed under certain bilateral agreements

Table 5.22: International road transport - loaded and unloaded (million tkm)

	1990	1995	1996	1997	1998	1999	2000	2001
Belgium	19 433	22 833	21 084	21 920	19 900	17 250	25 320	26 501
Denmark	5 145	12 421	11 344	11 226	10 796	12 276	12 166	10 510
Germany	:	33 664	33 887	38 751	42 173	45 652	48 684	52 150
Greece	2 119	867	841	1 734	1 272	:	:	1 500
Spain	12 271	22 513	25 250	28 348	32 814	35 066	40 472	45 323
France	34 064	40 041	40 333	39 439	40 291	41 975	37 863	35 917
Ireland	1 008	:	:	:	:	1 699	2 650	2 295
Italy	20 498	12 497	23 940	19 754	:	24 465	25 742	30 553
Luxembourg	:	3 341	:	1 213	1 245	1 461	1 529	2 009
Netherlands	30 896	33 901	35 147	35 999	36 809	41 005	37 876	37 470
Austria	:	12 474	13 103	13 613	14 610	15 653	16 712	18 623
Portugal*	5 152	7 199	8 846	10 046	10 188	10 990	11 855	12 228
Finland	:	:	4 295	4 190	4 515	3 712	3 977	3 671
Sweden	:	3 057	2 827	2 662	2 916	2 721	3 732	3 681
United Kingdom	10 651	14 415	15 523	16 263	16 122	16 905	14 951	13 208

* Since 2000, P reported only 'hire or reward' transport; the total was estimated on the basis of the 'own account'-share of 1999.
Source: Eurostat.

Estimates in italic.

between Member States or under community quota authorisations, which permitted hauliers to make journeys between any two Member States. Since 1993 these quantitative restrictions for international road transport have been replaced by qualitative restrictions: holders of a 'community licence' can make journeys between any two Member States.

Cross-trade: share of 10 %

Table 5.23 displays the number of tkm performed in cross-trade transport. The figures express the performance by nationality of the

operators and are not related to the territory where this transport took place. In fact, if cross-trade transport and 'regular' international transport for 2001 are taken together, it appears that cross-trade transport is far from negligible: 34 927 out of 322 655 million tonne kilometres, or 10.8% (1998: 9.6%).

Especially smaller Member States with a geographically central location have a relatively high proportion of cross-trade transport, not only in absolute numbers but also when compared to 'regular' international transport. This is notably

Table 5.23: Cross-trade road goods transport performed by hauliers registered in the reporting Member States (million tkm)

	1990	1995	1996	1997	1998	1999	2000	2001
Belgium	2 298	3 799	3 746	2 933	3 848	3 339	4 606	4 481
Denmark	:	499	432	478	390	436	606	573
Germany	:	2 762	2 656	3 293	3 855	4 354	4 086	5 109
Greece	4	:	:	:	:	:	:	:
Spain	:	373	454	495	703	791	1 064	1 369
France	2 174	2 694	2 911	2 795	2 811	2 957	2 157	1 775
Ireland	184	:	:	:	:	354	563	371
Italy	:	186	237	:	:	509	411	610
Luxembourg	:	:	1 767	2 594	2 710	3 436	4 436	4 647
Netherlands	4 396	5 972	6 269	6 493	7 014	8 246	8 455	8 020
Austria	:	2 930	3 202	3 390	3 798	5 827	5 676	6 006
Portugal*	133	468	361	332	352	688	774	1 298
Finland	:	:	153	21	74	103	231	82
Sweden	:	64	50	70	26	17	318	347
United Kingdom	361	291	401	392	403	292	223	238

* Since 2000, P reported only 'hire or reward' transport; the total was estimated on the basis of the 'own account'-share of 1999.
Source: Eurostat.

Estimates in italic.

Table 5.24 Cabotage performed by hauliers from reporting country, in 1000 tonne-km

	1999	2000	2001
Belgium	937 571	1 365 845	1 635 484
Denmark	101 504	248 394	186 862
Germany	1 532 768	1 407 873	1 688 306
Spain	271 475	245 667	350 247
France	756 388	814 535	607 043
Ireland	415 751	725 118	537 354
Italy	349 788	273 395	599 436
Luxembourg	1 039 332	1 229 934	1 555 918
Netherlands	1 631 633	1 696 800	2 002 437
Austria	221 521	345 499	449 349
Portugal	99 008	39 009	147 912
Finland	:	49 118	45 971
Sweden	:	119 216	163 524
United Kingdom	44 140	110 125	58 791
EU-15*	:	8 670 528	10 028 635

* EU-15: excluding Greece.
Source: Eurostat.

the case for Belgium and the Netherlands. Largely due to the small size of its home markets, Luxembourg's cross-trade transport was even more than twice as important as 'regular' international transport. For all other Member States, and especially the peripheral ones, this type of transport is of lesser importance.

Data presented in Table 5.23 suggest that throughout the period observed, fluctuations occurred at Member State level. However, a general upward trend can be noticed for most

countries. There can be no doubt about the favourable effects (economical efficiency, reduction of environmental pressure due to less empty journeys) of cross-trade transport, which offers an important step for the realisation of a European common transport market.

Cabotage: international or national?

From the point of view of the movements of goods, cabotage transport (transport within a country by a haulier based in another country) should constitute a category of national road transport. In the economical sense however, as well as from the point of view of the declaring country, this type of road haulage is considered as international transport, since it is performed outside the territory of the reporting country. This is in line with the concept that applies to the road transport data collected under Council Regulation (EC) 1172/98. In the frame of this publication, Eurostat will consider cabotage transport as part of international transport.

Cabotage transport was gradually introduced in 1990 through the introduction of authorisation quotas. In the Benelux countries, quotas were already abolished at the end of 1992. The cabotage regime was extended to the EFTA states (except Switzerland) on 1 July 1994 following the creation of the EEA. The quotas were steadily increased and entirely abolished on the 1 July 1998.

Although Table 5.24 suggests a considerable increase of cabotage transport between 1999 and 2001, the overall influence remains small: with an estimated 988 000 million tkm in 2001,

Table 5.25 Trend in cabotage, as a share of total transport*, by reporting country, in %

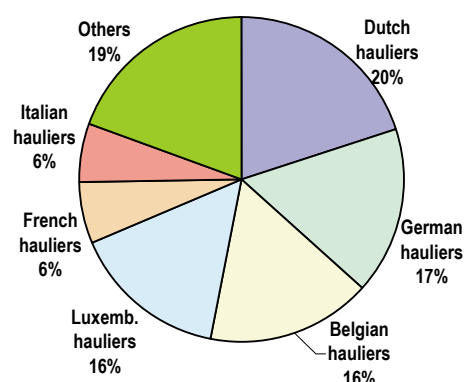
	1999	2000	2001
Belgium	2.51	2.68	3.08
Denmark	0.44	1.03	0.84
Germany	0.55	0.50	0.58
Spain	0.20	0.17	0.22
France	0.37	0.40	0.29
Ireland	4.07	5.91	4.36
Italy	0.20	0.15	0.32
Luxembourg	16.46	16.16	17.89
Netherlands	1.95	2.13	2.55
Austria	0.65	0.98	1.20
Portugal	0.38	0.14	0.44
Finland	:	0.15	0.15
Sweden	:	0.33	0.48
United Kingdom	0.03	0.07	0.04
EU-15**	:	0.67	0.76

* Total transport = cumulated performance of national, international, cross-trade and cabotage transport.

** EU-15: excluding Greece.

Source: Eurostat.

Graph 5.26: The most active 'caboteurs' in 2001



Source: Eurostat.

Table 5.27: Development of the volume of cargo and mail handled in worldwide international air traffic (1000 tonnes)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	Average annual increase 1993-2001
Belgium	306	375	426	449	518	585	:	:	583	8.4
Denmark	:	:	:	:	:	:	:	:	10	:
Germany	1 521	1 722	1 808	1 877	2 019	1 948	2 054	2 244	2 171	4.5
Greece	81	82	:	:	:	101	105	110	:	4.5 ¹
Spain	179	174	244	281	309	309	340	353	335	8.1
France	853	1 006	1 034	1 058	1 025	1 030	1 034	1 060	1 112	3.4
Ireland	:	43	58	39	70	59	66	72	64	:
Italy	403	438	459	475	454	446	413	459	:	1.9 ¹
Luxembourg	:	242	287	281	340	383	448	501	510	:
Netherlands	773	842	983	1 084	1 163	1 174	1 182	1 268	1 217	5.8
Austria	73	85	96	98	109	111	122	127	114	5.7
Portugal	86	94	101	101	:	:	:	:	108	2.9
Finland	:	:	:	:	92	94	90	92	83	:
Sweden	103	128	145	171	195	198	185	:	:	10.3 ²
United Kingdom	1 215	1 486	1 584	1 657	1 847	1 990	2 091	2 210	2 031	6.6

(2) 1993-1999

ources: Eurostat; Sweden: SIKI-Institute/Swedish Civil Aviation Agency.

national transport by resident hauliers was still 100 times more important than cabotage (10 029 million tkm).

Hauliers from small countries have more incentive to undertake cabotage due to their limited national markets and the fact that other national markets are geographically close. Table 5.25 and Graph 5.26 outline that road transport enterprises from the Benelux countries have been particularly active in the market: in 2001, they were responsible for more than a half of the entire cabotage transport performed in the EU.

The long time fears for 'unfair competition' from low labour cost countries remain unfounded: only 5% of the entire cabotage transport performance was carried out by hauliers registered in Spain and Portugal in 2001.

High increases in air transport

The development of international freight transport by air (worldwide) is displayed in Table 5.27. Figures are expressed in thousand tonnes of freight (cargo and mail) handled at the airports of the reporting countries. Most countries show a clear upward trend in the quantities loaded and unloaded, even though this trend seems to end in 2001. It should however be noted that countries report for 'major airports' only. Thus, the figures for the individual years sum up the volumes handled at a certain number of airports. If airports pass the threshold of compulsory reporting, the increase will be most noticeable. The number of

reporting ('major') airports in Spain for instance passed from 20 in 1994 to 28 in 1995 and stood at 34 for the reference year 2001.

Luxembourg airport fifth in international extra-EU air cargo handling

The total number of reporting airports is irrelevant for Table 5.28, which displays the 'top-20' airports in the EU with regards to cargo loaded and unloaded in 2001, separately for international intra-EU and international extra-EU freight traffic.

With regards to international intra-EU cargo traffic, Bruxelles-National leads well in front of the German airports of Cologne-Bonn and Frankfurt (Main). These three airports are the only ones handling over 200 000 tonnes of freight and mail annually. Amsterdam-Schiphol is the airport that registered the most important increase between 2000 and 2001 (+ 14.8%) whereas the opposite is true for München and London-Heathrow (with respectively -25.6% and -23.7%). Volumes of freight and mail handled in international extra-EU transport are sensibly higher: the three most important airports in this respect (Frankfurt/Main, Amsterdam-Schiphol and London-Heathrow) all handled well over one million tonnes each. It should however be noted that in 2001, those three airports all registered a decline compared to 2000. Within the top-20, it appears that in 2001, the airport of East Midlands (United Kingdom) registered the highest annual increase

Table 5.28: Top 20 airports in EU-15 based on cargo loaded/unloaded worldwide, 2001

Rank 2001	Airport	Intra-EU freight traffic			Airport	Extra-EU freight traffic		
		Volume handled in 2001 (1000 t)	Change 2000-2001 (%)	Aver. evolution 1993-2000 (%)		Volume handled in 2001 (1000 t)	Change 2000-2001 (%)	Aver. evolution 1993-2000 (%)
1	BRUXELLES-NATIONAL / B	274.0	:	:	FRANKFURT/MAIN / D	1 316.1	-6.08	+ 5.31
2	KÖLN-BONN / D	244.7	+ 3.44	+ 15.37	AMSTERDAM-SCHIPHOL / NL	1 063.1	- 4.91	+ 7.46
3	FRANKFURT/MAIN / D	214.7	- 0.82	+ 0.81	LONDON-HEATHROW / UK	1 040.0	- 7.45	+ 8.29
4	LONDON-HEATHROW / UK	133.2	- 23.74	+ 1.57	PARIS-CHARLES-DE-GAULLE / F	840.2	:	:
5	EAST MIDLANDS / UK	129.4	+ 4.52	+ 26.31	LUXEMBOURG / L	456.6	+ 1.34	:
6	PARIS-CHARLES-DE-GAULLE / FR	129.4	:	:	BRUXELLES-NATIONAL / B	309.0	:	:
7	AMSTERDAM-SCHIPHOL / NL	120.0	+ 14.83	+ 1.48	LONDON-GATWICK / UK	267.7	- 12.53	+ 8.38
8	MADRID-BARAJAS / E	70.8	- 5.93	+ 9.18	KÖLN-BONN / D	167.2	+ 11.50	+ 6.93
9	LUXEMBOURG / L	53.2	+ 5.78	:	MADRID-BARAJAS / E	144.0	- 1.57	+ 7.67
10	LONDON-STANSTED / UK	47.8	+ 1.07	+ 17.57	LONDON-STANSTED / UK	112.1	- 1.27	+ 15.45
11	HELSINKI / FIN	43.8	- 10.21	:	MANCHESTER-INTL / UK	95.1	- 6.13	+ 16.26
12	BARCELONA / E	40.6	- 4.91	+ 10.87	MÜNCHEN / D	88.9	+ 10.16	+ 11.36
13	LISBOA / P	39.6	:	:	WIEN-SCHWECHAT / A	70.9	- 12.84	+ 12.79
14	WIEN-SCHWECHAT / A	39.4	- 6.87	+ 2.80	PARIS-ORLY / F	38.2	:	:
15	PORTO / P	29.9	:	:	EAST MIDLANDS / UK	37.6	+ 16.50	+ 38.16
16	DUBLIN / IRL	24.0	- 8.54	:	LISBOA / P	35.2	:	:
17	VITORIA / E	20.9	- 13.51	:	HELSINKI / FIN	34.9	- 13.48	:
18	TOULOUSE-BLAGNAC / F	20.4	+ 11.71	+ 28.84	MANSTON / UK	32.5	+ 4.48	+ 47.94
19	MÜNCHEN / D	20.4	- 25.61	+ 3.26	DÜSSELDORF / D	31.7	- 8.29	+ 6.81
20	DÜSSELDORF / D	16.3	- 18.57	+ 0.22	PRESTWICK / UK	31.0	+ 0.67	+ 21.70

NB: Greece, Italy and Sweden did not report for 2001.
Source: Eurostat.

with 16.5%. This evolution is in line with the fact that this airport doubled its volume between 1999 and 2000.

EU-sea ports: 3 billion tonnes handled

For seaborne transport as for aviation, it is hard to proceed to a correct comparison of the transport performance of the various transport

modes as long as no tonne-kilometres indications are available. The information on seaborne transport presented in this chapter refers to the cargo tonnage handled (i.e. loaded and unloaded) in all ports of the various EU Member States. Table 5.29 offers an insight of the development of the tonnage handled by the reporting countries. An indication of the total tonnage handled in all

Table 5.29: Seaborne transport: gross weight of goods handled in all ports - in million tonnes

	1997		1998		1999		2000		2001	
	inwards	outwards	inwards	outwards	inwards	outwards	inwards	outwards	inwards	outwards
EU-15	1 893.2	1 018.9	1 971.5	1 010.9	1 944.3	1 023.1	1 957.6	1 027.2	2 013.9	1 013.4
Belgium	100.0	61.6	110.9	60.1	102.5	63.1	110.9	68.4	107.0	67.2
Denmark	71.6	52.4	59.2	45.8	54.4	42.8	52.9	43.7	51.7	42.3
Germany	140.5	72.9	144.9	72.5	143.1	78.5	152.2	90.3	156.5	89.6
Greece	59.5	41.8	66.2	44.3	67.4	45.2	75.3	52.5	63.4	49.1
Spain	184.9	85.7	198.0	82.2	213.0	82.7	171.6	63.3	229.4	85.7
France	222.3	82.8	234.7	84.3	227.4	87.7	243.9	92.6	231.4	86.1
Ireland	25.6	10.8	28.7	11.3	30.7	12.2	31.7	13.6	32.6	13.2
Italy	321.7	137.5	335.2	140.4	327.8	135.1	315.2	131.5	318.4	126.4
Netherlands	313.2	89.0	320.0	85.4	304.2	91.5	315.9	90.0	317.3	88.5
Finland*	39.1	36.2	39.0	37.5	38.1	39.3	41.1	39.5	50.7	45.4
Portugal	40.7	14.0	43.4	14.2	45.4	13.4	43.8	12.6	43.8	12.4
Sweden	79.0	70.9	85.2	70.5	83.4	73.0	86.8	72.5	82.9	69.9
United Kingdom	294.9	263.5	306.0	262.4	306.9	258.6	316.3	256.7	328.9	237.5

* Finland 1997-2000: without domestics transport.
Source: Eurostat.

Table 5.30: TOP 15 ports - on the basis of gross weight of goods handled (in 1000 t)

	1997		1998		1999		2000		2001*	
1	Rotterdam (NL)	303 427	Rotterdam (NL)	306 991	Rotterdam (NL)	299 506	Rotterdam (NL)	302 545	Rotterdam (NL)	296 620
2	Antwerpen (BE)	104 592	Antwerpen (BE)	111 592	Antwerpen (BE)	103 591	Antwerpen (BE)	115 988	Antwerpen (BE)	114 813
3	Marseille (FR)	92 936	Marseille (FR)	90 929	Marseille (FR)	87 643	Marseille (FR)	91 279	Marseille (FR)	89 518
4	Hamburg (DE)	69 583	Hamburg (DE)	68 912	Hamburg (DE)	73 358	Hamburg (DE)	76 950	Hamburg (DE)	82 948
5	Le Havre (FR)	58 207	Le Havre (FR)	62 783	Le Havre (FR)	60 303	Le Havre (FR)	63 883	Le Havre (FR)	65 356
6	London (UK)	55 692	London (UK)	57 311	London (UK)	52 206	Grimsby & Immingham (UK)	52 501	Grimsby & Immingham (UK)	54 831
7	Tees & Hartlepool (UK)	51 249	Tees & Hartlepool (UK)	51 454	Grimsby & Immingham (UK)	49 757	Tees & Hartlepool (UK)	51 473	Tees & Hartlepool (UK)	50 842
8	Grimsby & Immingham (UK)	47 991	Grimsby & Immingham (UK)	48 387	Tees & Hartlepool (UK)	49 316	London (UK)	47 892	London (UK)	50 654
9	Trieste (IT)	46 664	Trieste (IT)	47 557	Genova (IT)	46 775	Dunkerque (FR)	44 318	Amsterdam (NL)	48 073
10	Genova (IT)	43 633	Genova (IT)	45 213	Forth (UK)	45 396	Trieste (IT)	44 015	Trieste (IT)	44 712
11	Forth (UK)	43 102	Forth (UK)	44 400	Trieste (IT)	44 515	Genova (IT)	43 797	Genova (IT)	43 134
12	Amsterdam (NL)	36 942	Wilhelmshaven (DE)	43 950	Wilhelmshaven (DE)	39 731	Wilhelmshaven (DE)	43 402	Dunkerque (FR)	41 914
13	Taranto (IT)	36 720	Dunkerque (FR)	39 036	Dunkerque (FR)	38 025	Amsterdam (NL)	42 044	Forth (UK)	41 607
14	Wilhelmshaven (DE)	36 443	Taranto (IT)	36 593	Sullom Voe (UK)	37 680	Forth (UK)	41 143	Algeciras (ES)	41 134
15	Dunkerque (FR)	36 406	Amsterdam (NL)	35 241	Amsterdam (NL)	36 686	Bremen/ Bremerhaven (DE)	39 224	Wilhelmshaven (DE)	40 850

* Excluding Greece
Source: Eurostat.

ports (including the volume in national traffic) can be found in Chapter 5.1.1 *Transport of goods – General development*.

All main ports of the EU taken together handled 2 999 million tonnes of cargo in international traffic in 2001. The most important volumes were handled in the main ports of the United Kingdom (566.4 million t – or 19 % of the EU total) followed by those of Italy (444.8 million t – or 15 %) and the Netherlands (405.9 million t – or 13 %).

Port of Dunkerque: from rank 16 to rank 9

Table 5.30 further specifies that individual ports sometimes can take a very important position, mainly in the smaller Member States: the port of Rotterdam alone – by far the most important EU port with regards to tonnage handled – accounts

for a volume of 296.6 million tonnes. In the period observed, the top-5 ranking remains strictly unchanged although the ports of Antwerp, Hamburg and Le Havre increased their volume by more than 10%. Rotterdam and Marseille slightly decreased compared to 1997. It should however be noted that the various rankings in Table 5.30 refer to the total tonnage handled in the individual ports – including (often minor) volumes loaded and unloaded in national transport.

The only port in the 15% ranking with a noticeable decrease (-9% compared to 1997) was the port of London, due to the closure of a major oil terminal. Italian and Greek ports do not appear respectively in the 2000-ranking and the 2001-ranking since these countries did not report data for the years in question.

Candidate countries

As for the present EU Member States, the Candidate Countries have seen their overall volume of international freight transport growing constantly. As visible in Tables 5.31 and 5.32, this general upward trend has not been steady, neither by mode nor by individual country.

With regards to rail transport, Slovenia has seen the volume of its freight transport more than doubled since 1993 (+110%) while countries like Estonia and Romania registered considerable decreases (with respectively -47% and -46%) during the same period. The main countries in terms of absolute volumes handled are Poland (10 593 million tonne-kilometres), the Czech Republic (7 939 million tonne-kilometres) and the Slovak Republic (5 634 million tonne-kilometres), even though the latter country presents the second biggest annual decrease between 2000 and 2001 (-37%) just after Romania (-42%).

The evolution of road transport is more consistent for each Candidate Country: it has a clear upward

Table 5.31: International total freight transport (loaded + unloaded) in the Candidate Countries by mode of transport (million tonne-kilometres)

		1993	1994	1995	1996	1997	1998	1999	2000	2001
Rail	Bulgaria	911	645	711	603	563	666	507	729	537
	Cyprus	-	-	-	-	-	-	-	-	-
	Czech Republic	10 145	10 272	10 749	10 456	9 636	8 839	8 129	8 277	7 939
	Estonia	843	874	961	725	653	825	:	427	448
	Hungary	4 117	4 088	4 712	4 078	4 565	4 467	4 101	4 719	4 297
	Latvia	1 277	1 006	900	1 136	1 583	1 615	1 307	1 412	1 115
	Lithuania	:	2 374	2 322	2 145	2 240	2 181	1 541	1 453	1 409
	Malta	-	-	-	-	-	-	-	-	-
	Poland	8 907	10 620	15 264	12 715	12 904	13 197	10 048	11 649	10 593
	Romania	5 647	5 321	5 848	5 754	5 358	3 871	3 795	5 202	3 026
	Slovak Republic	:	:	:	:	9 097	8 657	7 439	8 918	5 634
	Slovenia	416	731	776	720	778	776	770	838	872
	Turkey	268	172	211	223	273	387	270	322	330
Road	Bulgaria	:	:	:	:	:	:	:	2 756	3 125
	Cyprus	:	:	:	:	:	:	:	:	:
	Czech Republic	:	10 515	15 072	14 052	21 120	13 318	18 612	20 482	22 202
	Estonia	:	:	:	:	:	:	:	:	:
	Hungary	3 220	3 590	3 801	4 900	5 414	6 433	6 212	6 690	6 320
	Latvia	:	:	:	:	1 731	1 867	1 951	2 417	2 789
	Lithuania	:	:	1 975	1 397	2 186	2 505	4 126	4 104	4 447
	Malta	:	:	:	:	:	:	:	:	:
	Poland	2 837	3 839	10 336	13 257	18 862	21 605	22 593	24 522	27 166
	Romania	1 146	1 736	2 197	2 646	3 204	4 912	3 605	4 248	7 666
	Slovak Republic	:	:	:	:	1 710	1 974	2 098	7 029	6 434
	Slovenia	1 445	1 465	1 338	1 308	1 341	1 485	1 440	1 620	1 751
	Turkey	-	-	-	-	-	-	-	-	-
Inland Waterways	Bulgaria	450	328	519	502	597	562	186	:	:
	Cyprus	-	-	-	-	-	-	-	-	-
	Czech Republic	:	:	966	934	716	801	784	642	493
	Estonia	-	-	-	-	-	-	-	-	-
	Hungary	918	843	1 187	1 259	1 288	1 435	888	805	698
	Latvia	-	-	-	-	-	-	-	-	-
	Lithuania	-	-	-	-	-	-	-	-	-
	Malta	-	-	-	-	-	-	-	-	-
	Poland	462	526	633	558	571	542	629	724	837
	Romania	128	199	666	1 071	885	631	617	397	626
	Slovak Republic	843	845	1 466	1 597	1 519	1 305	1 663	1 383	:
	Slovenia	-	-	-	-	-	-	-	-	-
	Turkey	-	-	-	-	-	-	-	-	-
Oil pipelines	Bulgaria	-	-	-	-	-	-	-	-	-
	Cyprus	-	-	-	-	-	-	-	-	-
	Czech Republic	1 978	2 175	2 276	2 271	2 106	2 078	1 795	1 612	1 661
	Estonia	-	-	-	-	-	-	-	-	-
	Hungary	1 622	1 538	1 355	1 452	1 550	1 640	1 525	1 526	1 637
	Latvia	0	163	190	178	195	211	236	233	264
	Lithuania	1 126	757	702	824	1 127	1 416	1 120	964	1 436
	Malta	-	-	-	-	-	-	-	-	-
	Poland	:	:	:	:	:	:	:	:	:
	Romania	1 718	2 027	2 168	1 858	1 589	1 558	732	544	909
	Slovak Republic	-	-	-	-	-	-	-	-	-
	Slovenia	-	-	-	-	-	-	-	-	-
	Turkey	:	:	:	:	17 758	36 836	40 283	38 206	30 843

Estimates in italic.

Bulgaria Inland waterways: only public sector enterprises.

Hungary Inland waterways: up to 2000, data included transport performances of Hungarian enterprises, since 2001, data are in line with the EU Directive, i.e. transport performance of Hungarian and foreign vessels on Hungarian waterways.

Latvia Oil pipelines: all oil and oil products included, where transited from Russia to Lithuania or via port to other third countries.

Lithuania: Inland waterways: including ferries.

Slovak Republic: Road: data consist of transport enterprises (NACE 60.2, excluding 60.21 and 60.22). 1993 1999: only organisations registered in the business register are included. 2000 2001: all organisations and tradesmen are included.

Inland waterways: included sea transport.

Slovenia: Road: only transport for "hire or reward" is taken into account.

Source: Eurostat.

Table 5.32: International total freight transport (loaded + unloaded) in the Candidate Countries by mode of transport (1000 tonnes)

		1993	1994	1995	1996	1997	1998	1999	2000	2001
Air	Bulgaria	14	13	12	9	10	10	8	:	:
	Cyprus	26	34	40	33	30	36	33	47	32
	Czech Republic	18	17	34	25	28	32	32	36	35
	Estonia	2	3	2	4	5	6	5	5	5
	Hungary	21	22	23	23	27	32	38	44	45
	Latvia	3	4	3	3	4	4	4	4	4
	Lithuania	:	:	18	15	11	9	10	12	15
	Malta	9	10	10	10	12	11	11	13	11
	Poland	24	29	35	47	56	54	50	57	49
	Romania	:	:	:	:	13	14	14	15	15
	Slovak Republic	:	:	:	:	0	0	0	0	0
	Slovenia	6	8	8	5	6	7	7	8	7
	Turkey	327	340	405	470	580	516	468	570	592
Sea	Bulgaria	5 077	6 934	7 778	7 308	6 832	4 980	4 949	6 930	5 342
	Cyprus	7 627	7 094	7 252	7 804	6 926	6 499	6 157	6 901	6 644
	Czech Republic	-	-	-	-	-	-	-	-	-
	Estonia	1 758	3 443	5 808	6 413	8 482	8 993	10 632	12 682	12 682
	Hungary	-	-	-	-	-	-	-	-	-
	Latvia	27 407	35 067	38 985	45 034	50 690	52 292	49 032	51 843	56 918
	Lithuania	15 772	14 524	12 721	14 836	16 131	15 016	15 655	22 724	22 359
	Malta	2 783	5 208	3 547	3 085	3 421	3 739	4 390	4 446	6 239
	Poland	49 783	51 148	48 179	47 878	50 630	50 563	49 227	47 335	46 210
	Romania	:	:	:	34 053	31 259	28 204	22 090	24 025	26 461
	Slovak Republic	-	-	-	-	-	-	-	-	-
	Slovenia	5 159	5 252	6 811	6 502	7 248	8 446	8 412	9 038	9 146
	Turkey	84 502	67 463	78 993	74 145	103 641	104 092	96 528	104 814	102 479

Bulgaria Air: only public sector enterprises. Sea: data refer to Bulgarian companies.
Czech Republic: Air: data concern all commercial air carriers (Czech and foreign).
Source: Eurostat.

trend. The figures suggest that a country can increase its international road transport significantly in a short period. For instance, Romania shows an increase of 80 % between 2000 and 2001, becoming the 3rd Candidate Country in terms of road transport freight volume with 7 666 million tonne-kilometres, but far behind Poland (27 166 million tonne-kilometres) and the Czech Republic (22 202 million tonne-kilometres).

The volume of freight carried by sea, based on the number of tonnes handled, is either increasing or keeps constant for the majority of the countries during the period covered. Three countries alone account for 70 % of the sea transport in these countries in 2001: Turkey with 35% (102 million tonnes), followed by Latvia, 19% (57 million tonnes) and Poland, 16% (46 million tonnes). In terms of absolute values, Romania presents the most important decline since 1996 with a loss of about 7 600 thousands tonnes (-22%), but the trend is being inverted since 2000, with two consecutive years of positive evolution. Most goods are handled or transhipped in Constantza, located at the end of the Rhine-Main-Danube corridor and one of the main Black-Sea ports.

The three other modes of transport – inland waterways, oil pipelines (both expressed in tonne-kilometres in the Table 5.31) and air (in tonnes, see Table 5.32 - represent a small volume compared to the previously mentioned modes. The volume handled by these three modes is relatively constant over the years, the highest growth rates being mostly due to low absolute values. Within the Candidate Countries group, Turkey takes the lion's share in the transport by oil pipelines (84%) and by air (73%) while the Slovak Republic and Poland are the leading countries in terms of transport by inland waterways in 2001 (with respectively 1 383 (in 2000) and 837 million tonnes-kilometres). Obviously, certain countries do not offer all transport modes covered in the previously mentioned tables.

5.1.4. Transport by group of goods

A common nomenclature for the classification of goods (NST — Nomenclature des Statistiques de Transport) came into force in 1961. This nomenclature was to be used for the statistics of transport in the European Community. The NST consisted of 176 headings, 52 groups and 10 chapters. In 1967, a revised version (NST/R) was made with a view to harmonisation and improvement. The NST 2000, aiming at a further harmonisation with mainly nomenclatures used in foreign trade statistics, is expected to become the new standard in the near future.

Soon from NST/R to NST 2000

The NST/R is widely used in EU-15. Nearly all Member States apply it at some level in their national statistics. Some countries use other specific classifications alongside the NST/R.

The information presented in the frame of this publication is limited to the 10 chapters of the NST/R nomenclature and refers to national and international transport. Depending on data availability, statistical information of various Member States was compiled to give the best possible view. This means that footnotes attached to the various graphs should be carefully read. The 10 chapters consist of a grouping of the 24 groups of goods, derived from the NST/R. The window offers a concise description of this grouping.

Not all Member States feature inland waterway transport

Table 5.33 (national transport) and Table 5.34 (international transport) outline the transport performances (expressed in 1000 tonnes) of the three inland modes for selected Member States. It should be noted that data were compiled on the basis of data availability. This does however not distort the significance in the relative distribution by NST/R chapters. Furthermore, not all Member States contribute to the account of inland waterway transport.

It is recalled that figures presented in this chapter are based on tonnes forwarded and not on tonne-kilometres (tkm) performed. The results of this analysis cannot be compared with equivalent data expressed in tkm (that take into account the distances travelled).

Apart from showing the absolute importance of national transport with regard to the volumes forwarded, Table 5.33 shows the dominance of road transport. When the three transport modes are taken together, Chapter 6 of the NST/R (crude and manufactured minerals, building materials) appears to be the most important group of all types of goods forwarded (43%). Chapter 9 (machinery, transport equipment, manufactured and miscellaneous articles) and Chapter 1 (foodstuffs and animal fodder) follow with 19 % and 11 % respectively.

Share of road: 94% in national, 'only' 55% in international transport

The situation is quite different in international transport (see Table 5.34). Surprisingly, it appears that in 2001, 'only' 55 % of the total amount of

NST/R chapters

- 0 Agricultural products and live animals
- 1 Foodstuffs and animal fodder
- 2 Solid mineral fuels
- 3 Petroleum products
- 4 Ores and metal waste
- 5 Metal products
- 6 Crude and manuf. minerals, building materials
- 7 Fertilizers
- 8 Chemicals
- 9 Machinery, transport equipment, manufactured and miscellaneous articles

Table 5.33: National transport in 2001 - by group of goods (NST/R chapter) - in 1000 tonnes

	NST/R chapters										Total	Modal split
	0	1	2	3	4	5	6	7	8	9		
Road transport	921 130	1 265 591	72 745	505 952	144 519	325 967	4 785 898	123 713	506 699	2 148 767	10 800 981	93.6%
Rail transport	35 200	15 362	95 106	41 888	52 987	85 111	81 706	9 700	30 980	81 694	529 734	4.6%
IWW transport	7 314	13 299	14 894	39 866	6 609	4 268	101 554	3 518	12 726	9 141	213 189	1.8%
Total	963 644	1 294 252	182 745	587 706	204 115	415 346	4 969 158	136 931	550 405	2 239 602	11 543 904	100%
Share	8%	11%	2%	5%	2%	4%	43%	1%	5%	19%	100%	

Note: Road: GR: 1998. Rail: ES, IT: 2000 data ; FR, PT, SE: 1999 data ; IE: 1998 data ; UK: 1994 data. Road and rail: LU not considered. Inland waterways: BE (2000 data), DE, FR, NL, AT. Source: Eurostat.

Table 5.34: International transport in 2001 - by group of goods (NST/R chapter) - in 1000 tonnes

	NST/R chapters										Total	Modal split
	0	1	2	3	4	5	6	7	8	9		
Road transport	62 306	63 181	2 584	10 763	6 207	37 397	65 124	5 446	61 220	181 891	496 119	55.4%
Rail transport	22 532	3 790	15 589	7 512	15 366	23 460	10 369	2 885	11 391	53 896	166 790	18.6%
IWW transport	10 439	12 445	26 588	34 784	39 139	10 705	51 191	7 215	17 320	23 531	233 357	26.0%
Total	95 277	79 416	44 761	53 059	60 712	71 562	126 684	15 546	89 931	259 318	896 266	100%
Share	11%	9%	5%	6%	7%	8%	14%	2%	10%	29%	100%	

Note: Rail and Inland Waterways based on receipts
 Road: GR: 1998. Rail: IT, AT: 2000 data ; EL, ES, PT: 1999 data ; FR: 1998 data ; UK: 1994 data. Road and rail: DK, IE, LU, SE not considered
 Inland waterways: BE (2000 data), DE, FR, NL, AT.
 Source: Eurostat.

tonnes forwarded use the road as mode of transport, ahead of inland waterways with 26%. The remaining part is carried by rail (19%).

International transport of all inland modes considered, Chapter 9 has the most important share with 29 %, followed by minerals and building materials (Chapter 6) with 15 % and chemicals (Chapter 8) as well as agricultural products (Chapter 0) with both a share of 10%.

Inland waterway vessels forward the highest volume in five out of ten NST/R chapters (Chapter 2, 3, 4, 6 and 7).

The most complete picture can however be obtained when looking at Graphs 5.35 to 5.40: they offer both an insight by mode of transport, show the modal particularities and demonstrate the relative importance of rail and inland

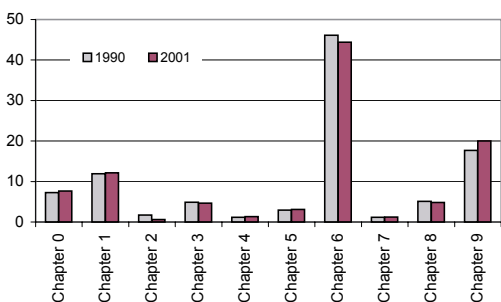
waterway transport for heavy and bulky goods like building materials, ores and petroleum products.

The following paragraphs will focus on the characteristics of the distribution of the NST/R chapters within the inland transport modes.

Minerals and building materials very dominant only in national road transport

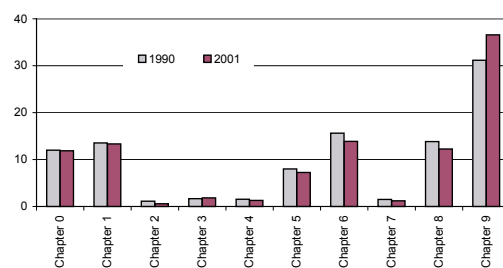
Looking at the two graphs of road transport individually (Graph 5.35 and 5.36), it appears that there have been no major changes in the percentage shares of the various goods groups between 1990 and 2001, especially with regards to national transport. More interesting is the comparison of the various NST/R chapters between national and international transport. It then appears that the transport of crude and manufactured minerals and building materials

Graph 5.35: Share of NST/R goods chapters in national road transport in 1990 compared to 2001 (%)



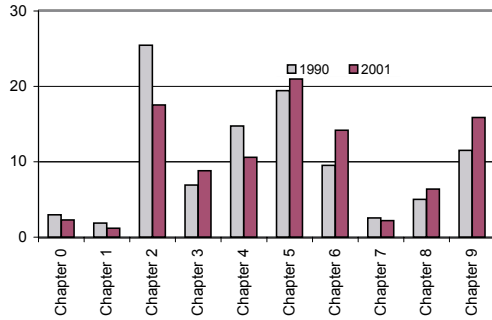
NB: Data are based on tonnes forwarded by the following Member States: BE, DK, DE, ES, FR, IE, IT, NL, PT, UK.
 Source: Eurostat.

Graph 5.36: Share of NST/R goods chapters in international road transport in 1990 compared to 2001 (%)



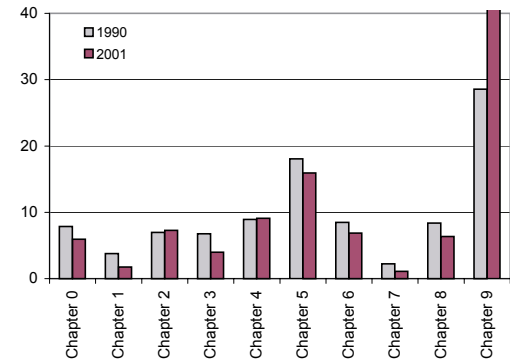
NB: Data are based on tonnes forwarded by the following Member States: BE, DK, DE, ES, FR, IE, IT, NL, PT, UK.
 Source: Eurostat.

Graph 5.37: Share of NST/R goods chapters in national rail transport in 1990 compared to 2001 (%)



NB: Data are based on tonnes forwarded by the following Member States: BE, DK, DE, EL, ES, IT, NL and PT. - GR, PT: 1999 data ; ES, IT: 2000 data
Source: Eurostat.

Graph 5.38: Share of NST/R goods chapters in international rail transport in 1990 compared to 2001 (%)



NB: Data are based on tonnes forwarded by the following Member States: BE, DE, EL, ES, IT, NL, and PT. - IT: 2000 data and GR, ES, PT: 1999 data instead of 2001.
Source: Eurostat.

(Chapter 6) alone accounts for nearly half (44 %) of the total volume of national road transport whereas the same goods category represents only around 14 % in international traffic (all percentages refer to 2001).

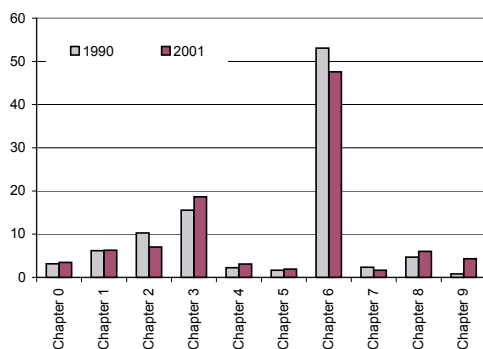
The other most remarkable difference concerns NST/R Chapter 9 (Machinery, transport equipment, manufactured articles and miscellaneous goods): here, the opposite applies:

in national transport, the share amounts to 20 %, whereas in international transport, this same group accounts for 37 %.

Goods in containers increasingly allocated to 'miscellaneous goods'

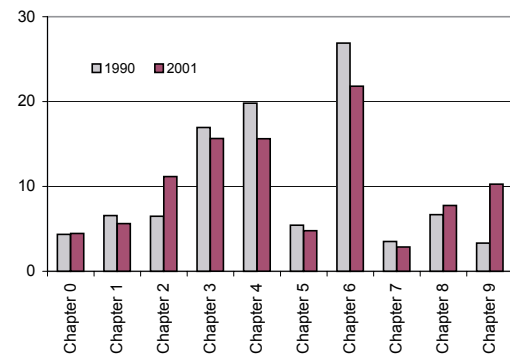
Although not visible in Graph 5.36, it should be noted that NST/R goods group 24 — 'miscellaneous articles' —, a subgroup of Chapter

Graph 5.39: Share of NST/R goods chapters in national inl. waterway transport in 1990 compared to 2001 (%)



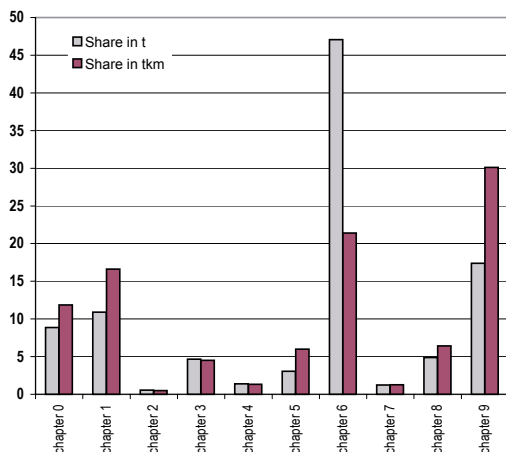
NB: Data are based on tonnes forwarded by the following Member States: BE (2000 data instead of 2001), DE, FR, LU, NL.
Source: Eurostat.

Graph 5.40: Share of NST/R goods chapters in international inl. waterw. transport in 1990 comp. to 1999 (%)



NB: Data are based on tonnes forwarded by the following Member States: BE, DE, FR, LU, NL.
For BE : 2000 data instead of 2001.
Source: Eurostat.

Graph 5.41: Share of NST/R goods chapters in national road transport 2001 - tonnes and tonne-kilometres (%).



NB: National goods transport in all Member States except EL and UK have been taken into account.
Source: Eurostat.

9, is largely responsible for the higher share in 2001 compared to 1990: whereas group 24 was responsible for 30 % of the volume in tonnes of Chapter 9 in 1990, it increased to 40 % in 2001. It has been experienced that goods in containers, for which the content is not exactly known by

reporting authorities, are increasingly allocated to 'miscellaneous goods'. Similar remarks can be made for rail transport.

National rail transport: most balanced shares

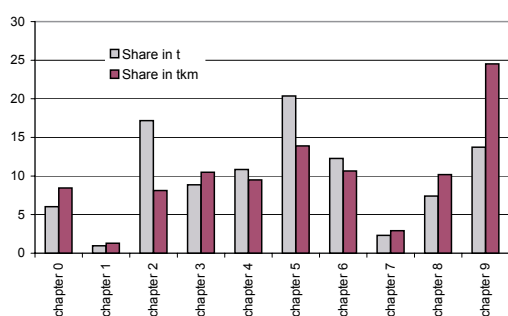
Rail transport shows quite different characteristics when comparing national and international transport. In national transport (see Graph 5.37), the share of solid mineral fuels (NST/R Chapter 2), still dominant in 1990, decreased mainly on behalf of minerals and building materials (Chapter 6) and machinery, transport equipment and miscellaneous articles (Chapter 9). The transport of metal products (Chapter 5) remained important and had the highest share in 2001. Considering the three inland transport modes, national rail transport features the most balanced shares of the various goods groups.

In international transport (see Graph 5.38), metal products (Chapter 5) are the second most important group of goods, dominated only by machinery, transport equipment and miscellaneous articles (Chapter 9), which increased substantially compared to 1990 (from 29 % to 42 %).

Ores and metal waste: low share in national, high share in international transport

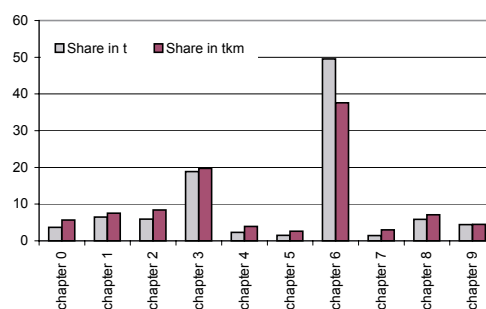
With a share of 48 % in 2001, crude and manufactured minerals and building materials (Chapter 6) dominate national inland waterway transport (see Graph 5.39). The second most important group of goods consists of petroleum

Graph 5.42: Share of NST/R goods chapters in national rail transport 2001 - tonnes and tonne-kilometres (%).



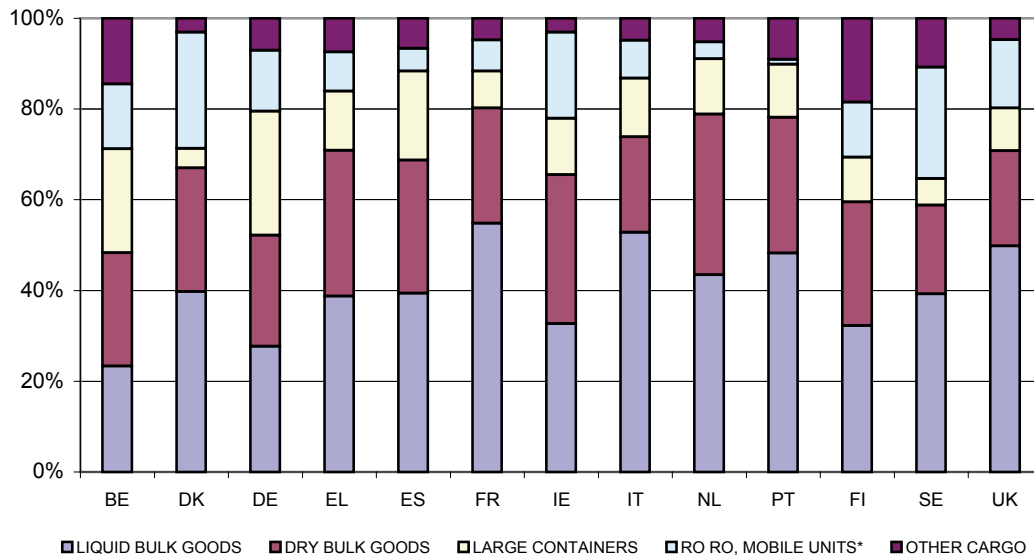
NB: Data are based on indications of the following Member States: BE, DK, DE, NL, AT, FI.
Source: Eurostat.

Graph 5.43: Share of NST/R goods chapters in national inland waterway transport 2001 - tonnes and tonne-kilometres (%).



NB: Data are based on indications of the following Member States: BE, DE, FR, LU, NL, AT.
Source: Eurostat.

Graph 5.44 : Maritime transport: share of types of cargo handled (inward and outward) in main ports in 2001 (in % of total cargo handled)



*Ro-Ro mobile units: roll on-roll off; either self-propelled or not.
Source: Eurostat.

products (Chapter 3). Between 1990 and 2001, their share increased from 16 to 19 %. Solid minerals fuels (Chapter 2) follow with 7 % (2001). These three NST/R chapters together account for 73 % of the entire national transport on inland waterways in 2001.

Chapter 6 takes the highest share in international inland waterways transport as well (see Graph 5.40), but only by a small margin (share: 22 % in 2001). Ores and metal waste (Chapter 4), having a very low share in national transport (3 %) are of considerable importance in international transport with a share of 16 %. The share of petroleum products also comes with 16 %, a share comparable to that registered in national transport (19%). Overall, there is a more even distribution in the type of goods in international transport than in national transport. Finally, the increase of the share of Chapter 9 in 2001 compared to 1990 is noticeable, both in national and international transport. The remark on the problems in reporting procedures made earlier (road transport) also seems to apply to a certain extent to inland waterway transport.

Machinery, transport material and manufactured articles: relatively light but travelling far

All elements outlined so far were based on volumes carried in tonnes, and did not take into account over what distance these were forwarded. Information given in Graph 5.41, 5.42

and 5.43 compiles datasets for a selection of countries, which reported national transport data for 2001 both expressed in tonnes and tonne kilometres.

In road transport for instance (Graph 5.41), the share of Chapter 6 reaches 47 % when expressed in tonnes, yet only 21 % when expressed in tonne kilometres. Hence minerals and building materials remain – weightwise – the dominant type of goods, those goods were however carried over a relatively short distance. The opposite, albeit at a lesser degree, can be said for Chapter 9 and Chapter 1: here, quantities are carried over much longer distances.

The situation for Chapter 9 is similar in rail transport (Graph 5.42): expressed in tonnes, its share is only 14 %, whereas it registers substantially more (25 %) when expressed in tonne-kilometres. The opposite is true for solid mineral fuels (Chapter 2), where distances covered are obviously lower (weightwise a share of 17% but a weight-over-distance share of only 8 %) and, at a lesser degree, for metal products (Chapter 5), where the share in tonnes is 20 % against 14 % in tonne-kilometres.

In national transport over navigable inland waterways, crude and manufactured minerals and

building materials (Chapter 6) take the lion's share, both for tonnes forwarded (50 %) and for tonne-kilometres (38 %). Petroleum products (Chapter 3) come in second position with an equivalent share for both measurement units (19 % for tonnes and 20 % for tonne-kilometres).

Ro-Ro: substantial in Denmark and Sweden _____

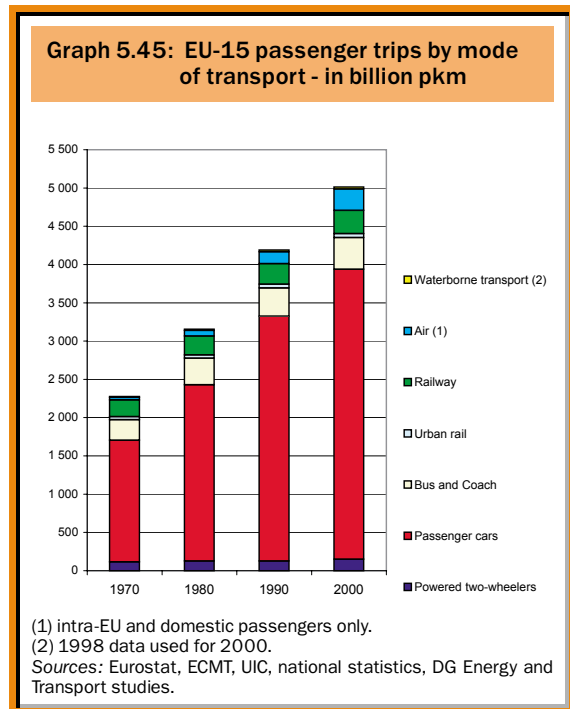
In maritime transport, consistent data are available by type of cargo, a more general classification of goods compared to the NST/R goods chapters. The information displayed in Graph 5.44 refers to the share (in %) of the various types based on the total weight of the cargo handled in the main ports of the individual Member States in 2001. 'Main ports' refer to

ports handling over 1 million tonnes of cargo annually.

It appears that bulk cargo continues to play a dominant role in all Member States: the share of liquid and dry bulk together ranges from around 50 % in Belgium, and Germany to around 80 % in Portugal, France and the Netherlands. The handling of containers is important in Germany and Belgium (share of 27% and 23% respectively), but of minor importance in Denmark (4 %) or Sweden (6 %). For countries featuring major car ferry services, the share of ro-ro (roll on – roll off) mobile units is substantial: 26 % in Denmark, 25 % in Sweden and 19 % in Ireland. For Finland, 'other cargo', which notably includes forestry products, accounted for nearly a fifth (18%) of the total, the highest for any country.

5.2. Passenger transport

5.2.1. General development



- the rapid growth of the services sector with demands for the mobility of professionals;
- a higher average disposable income resulting in a higher level of car ownership;
- increased leisure time resulting in more holiday journeys and recreational trips.

Transport demand up by 120% since 1970: rise in the share of air travel

In 2000, transport demand in EU-15 (comprising transport by passenger cars, powered two-wheelers, buses and coaches, subways, trams, trolleys, railways and air) was estimated to be some 5 thousand billion passenger kilometres (pkm) per year. When considering the equivalent figure of 1970 (2 265 billion pkm), the transport demand increased by 120%.

Air and passenger cars increased their share in the total, while rail, buses and coaches and powered two-wheelers saw their share decline.

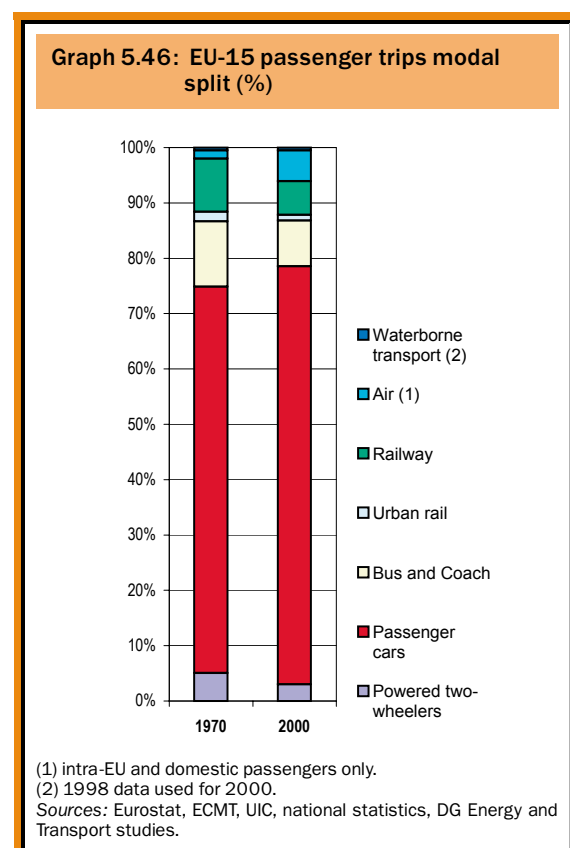
Efficient passenger transport systems are essential for both the European economy and every individual's quality of life. They should meet the mobility requirements of citizens while being sufficiently flexible to follow the evolution of transport demand.

Independence and flexibility mainly through cars

In the past half century, the demand for mobility has largely been satisfied by the increased use of private cars, which accounts today for roughly three-quarters of all trips. While the car offers a high degree of independence and flexibility, it has to be remembered that about a quarter of European households do not have access to a private car.

The main factor behind the increased demand for mobility has mainly been the geographical dispersion of economic activity with a clear trend towards moving away from the older urban centres. Consequently, there has been:

- a separation of the place of work and residential areas, leading to an increase in commuting;
- an increasing number of households where at least two family members work at distinct locations other than the place of residence;



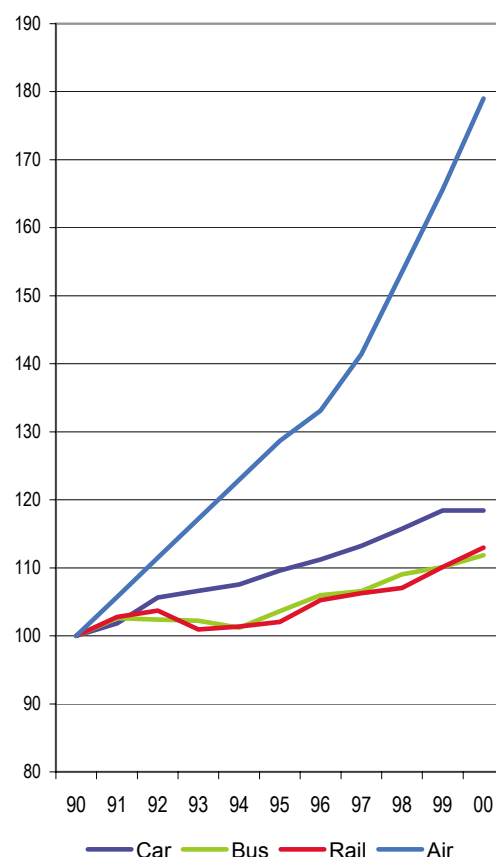
Air travel : up 753% in 30 years

While passenger car transport progressed at a higher pace than the average (140 %), passenger air transport saw the largest increase, from 33 billion pkm in 1970 to 281 billion pkm in 2000, a rise of 753 % (see Table 5.47 and Graph 5.48). In this context, air transport means international intra-EU and domestic travel only, extra-EU travel is excluded. The increase for all transport modes was greatest between 1970 and 1980, except for urban rail (trams and metro).

357 million maritime passengers in 2001: mainly intra-EU ferries

For maritime transport, there is currently no data for passenger kilometres available (though developments are underway to make it available in the future). This handicaps the comparison with the other transport modes. What is available at Eurostat outlines the number of passengers embarked and disembarked in EU ports. Table 5.49 shows these passenger volumes for the individual Member States. Luxembourg and Austria, with no direct access to the sea are obviously not included in this table. 357 million passengers passed through EU ports in 2001. This figure should be treated with care: it includes passengers that have made national, international intra-EU and international extra-EU journeys. On this basis, passengers in national and intra-EU traffic are double counted, once at embarkation and once at disembarkation. As a result, the figures in Table 5.49 reflect the passenger traffic through EU ports at national level. The considerable increase for Greece in 2001 is due to two ferry lines (Rio-Antirio and Piraeus-Salamina) beginning reporting.

Graph 5.48: Evolution of passenger transport in EU-15 (1990=100) - on the basis of pkm performed



Source: DG Energy and Transport.

Table 5.47: Passenger transport performance by mode in EU-15

	1 000 million pkm					
	Passenger cars	Buses and coaches	Tram & metro	Railway	Air*	Total
1970	1 582	269	39	219	33	2 142
1980	2 295	348	41	248	74	3 006
1990	3 199	369	48	268	157	4 041
1995	3 506	382	47	274	202	4 410
2000	3 789	413	53	303	281	4 839
1970-1980 (%)	+ 45	+ 29	+ 5	+ 13	+ 124	+ 40
1980-1990 (%)	+ 39	+ 6	+ 19	+ 8	+ 113	+ 34
1990-2000 (%)	+ 18	+ 12	+ 10	+ 13	+ 79	+ 20
1970-2000 (%)	+ 140	+ 53	+ 36	+ 38	+ 753	+ 126

* intra-EU and domestic passengers only.

Sources: ECMT, UIC, UITP, DG Energy and Transport studies, national statistics, estimates.

Graph 5.50 gives the breakdown of the passenger transport by national, international intra-EU and international extra-EU transport. The large majority of the maritime transport of passengers is accounted for by ferry-services.

Decline of air transport in 2001

Graph 5.51 shows the trends in the development of total passenger air transport at EU-level between 1993 and 2001 based on the number of passengers carried. As the graph indicates, the number of passengers carried on international intra-EU and international extra-EU flights follows largely the same trend and are at about the same level (2001: 217 million passengers on intra-EU flights, 207 million passengers on extra-EU flights). Data for domestic air transport is only available since 2000 (140 million passengers on domestic flights in the various EU countries in 2001, against 146 million in 2000). All three categories of air transport thus clearly show the negative effects of the tragic events of 11 September 2001. Graph 5.52 shows the split in traffic for individual Member States for 2001. Passengers on domestic flights obviously play a considerable role in geographically large Member

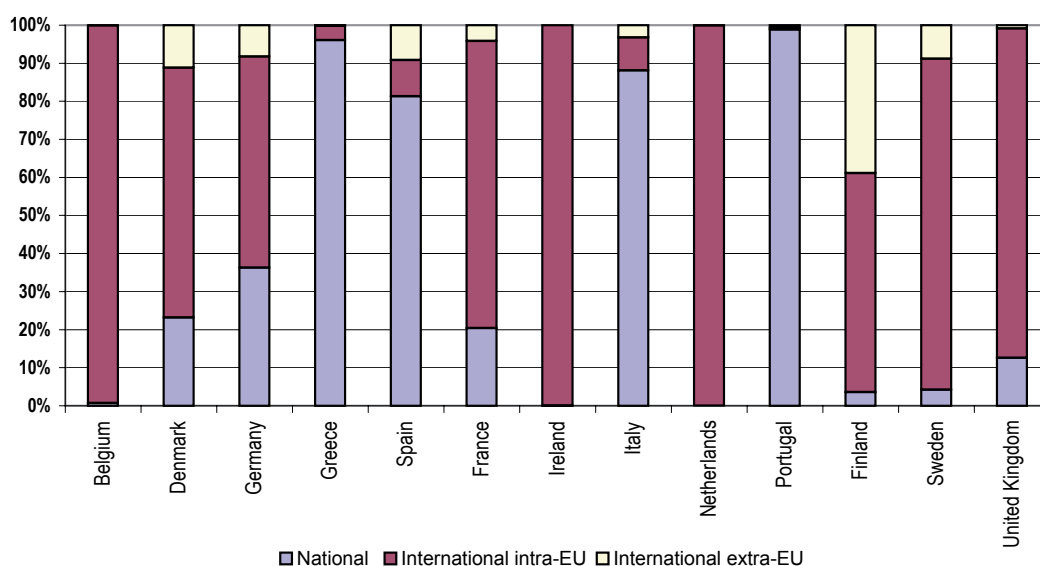
Table 5.49: Maritime passenger transport in Member States: number of passengers embarked and disembarked in all ports (in 1000)

	1997	1998	1999	2000	2001
Belgium	1 946	1 696	1 553	1 520	1 377
Denmark	75 928	63 448	57 345	51 830	47 862
Germany	:	:	:	31 378	31 817
Greece	32 259	35 364	37 180	27 867	50 125
Spain	13 939	15 349	16 225	14 582	18 623
France	33 124	30 825	30 436	27 842	27 755
Ireland	3 164	3 189	2 796	4 218	3 895
Italy	80 184	80 621	85 439	86 376	86 882
Netherlands	1 964	1 840	1 949	2 004	2 041
Portugal	:	473	472	534	542
Finland ¹	15 191	15 986	16 146	15 964	16 729
Sweden	40 949	41 749	41 574	36 573	32 350
United Kingdom	36 287	36 884	35 813	33 851	34 516

(1) N.B. : National passengers counted twice (at port of embarkation and disembarkation)
National transport not declared 1997-2000.
Source: Eurostat.

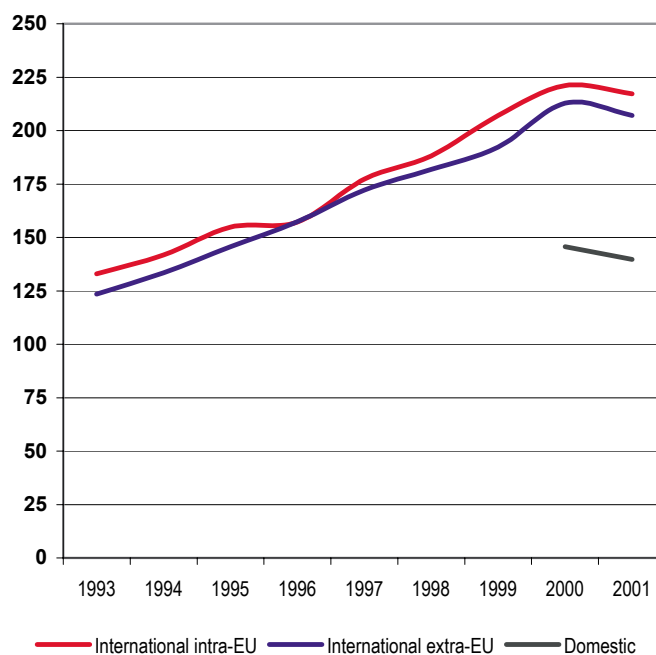
States. Conversely, domestic figures are either very low or non-existent for smaller countries like Belgium, the Netherlands or Luxembourg.

Graph 5.50: Maritime transport: share of national, international intra-EU and international extra-EU passenger transport, 2001



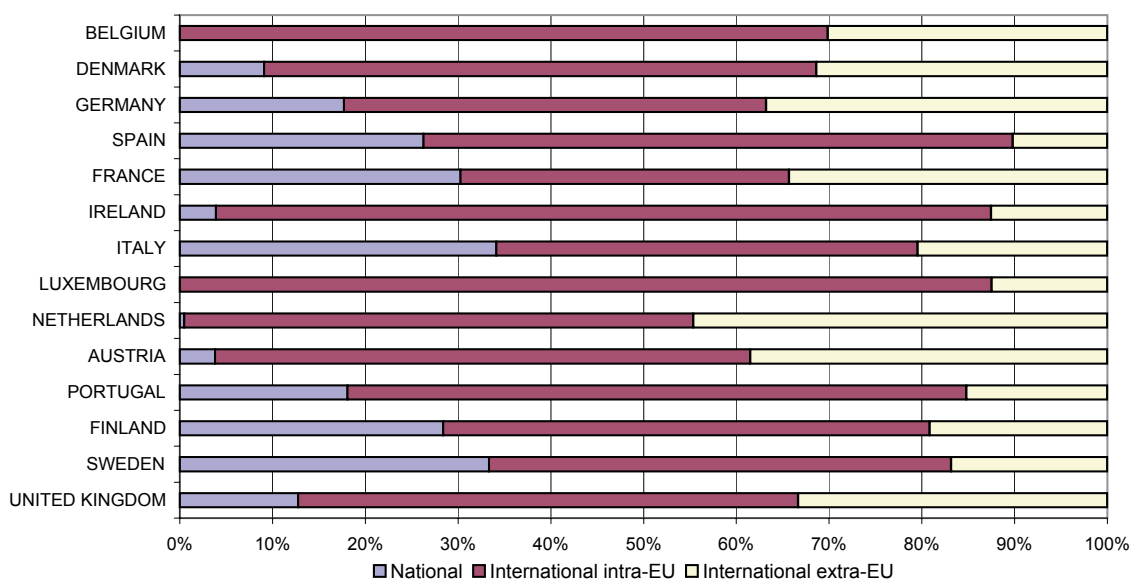
Source: Eurostat.

Graph 5.51: Evolution of passenger air transport in EU-15, in million passengers



Source: Eurostat.

Graph 5.52: Passenger air transport: distribution between national, international intra-EU and international extra-EU transport, 2001



Note: no data available for Greece.
Source: Eurostat.

Candidate Countries

Performances of bus and rail transport in the candidate countries, based on passenger-kilometres, are shown in Table 5.53. In this group of countries, Turkey excels with 77 billion passenger-kilometres performed in bus transport, representing a share of 48%. Poland (31 billion passenger-kilometres and a share of 19%) is another country with considerable performances using this mode. However, Hungary and Latvia are the two only countries where bus transport registered an increase between 1993 and 2001, with 16% and 34% respectively. The opposite is true for Bulgaria and Romania, registering a serious decline (-90% and -66% respectively).

A rather homogeneous trend can also be registered in rail transport, where only two countries progressed between 1993 and 2001: Slovenia (with 41%) and Hungary (19%). All the other countries registered less passenger-kilometres over the same period, especially the three Baltic countries Lithuania (-80%), Estonia (-75%) and Latvia (-70%). In terms of pure rail passenger transport performance, Poland comes first, with 18 billion pkm, ahead of Romania (11 billion pkm) and Hungary (10 billion pkm).

The evolution of the transport by air is given in Table 5.54 for the national flights, and also for international flights at arrivals and departures. It seems that national transport in the Candidate Countries registered an important decline between 2000 and 2001 (from 15.0 million to 11.9 million passengers). Actually, this trend reflects mostly the declarations of Turkey, this country having a share in the total domestic air transport of the Candidate Countries of 89 % and 84 % in 2000 and 2001 respectively.

The international passenger transport, both for arrivals and departures, is still progressing in 2001. With 28.2 million passengers for arrivals and 28.3 million passengers for departures, international transport of passengers in the Candidate Countries increased by 8.0% for arrivals and 6.4% for departures compared to 2000.

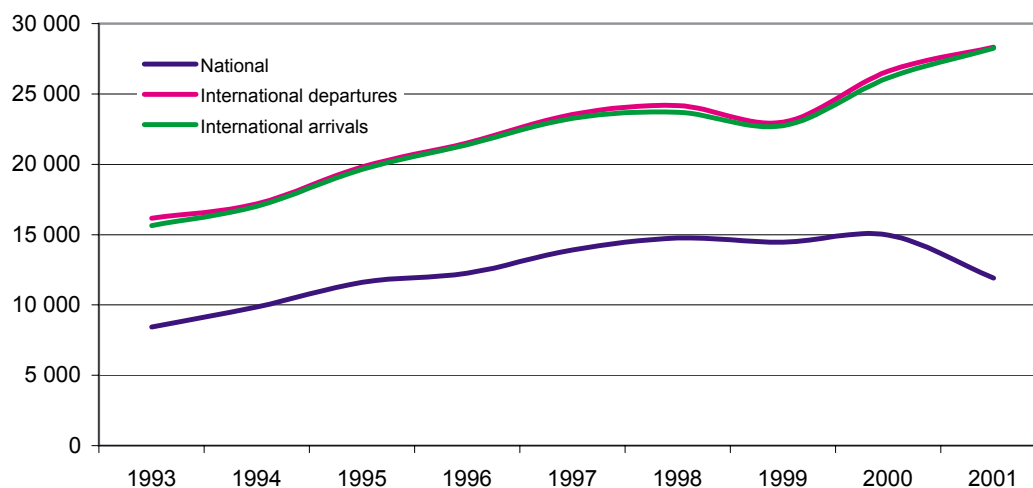
The share of each Candidate Country in the total transport by sea is given in Graph 5.55. It appears that the share of Poland and Estonia have increased significantly from 8% to 26% and from 35% to 42% respectively. This opposite phenomenon can be observed for Turkey, Cyprus and Malta, for which the share decreased substantially between 1993 and 2001.

Table 5.53: Candidate countries: passenger transport by bus and rail (million pkm)

	Bus			Rail		
	1993	2001	Evolution 1993-2001 (%)	1993	2001	Evolution 1993-2001 (%)
Bulgaria	8 814	870	-90	5 837	2 990	-49
Cyprus	:	:	:	-	-	:
Czech Republic	13 617	10 605	-22	8 548	7 299	-15
Estonia	2 538	2 461	-3	722	183	-75
Hungary	15 821	18 326	16	8 432	10 005	19
Latvia	1 722	2 305	34	2 359	706	-70
Lithuania	2 077	1 042	-50	2 700	533	-80
Malta	:	:	:	-	-	:
Poland	37 812	30 996	-18	24 742	18 208	-26
Romania	20 512	7 073	-66	19 402	10 966	-43
Slovakia	11 445	8 253	-28	4 569	2 805	-39
Slovenia	2 751	1 470	-47	453	639	41
Turkey	86 914	76 800	-12	7 147	5 568	-22

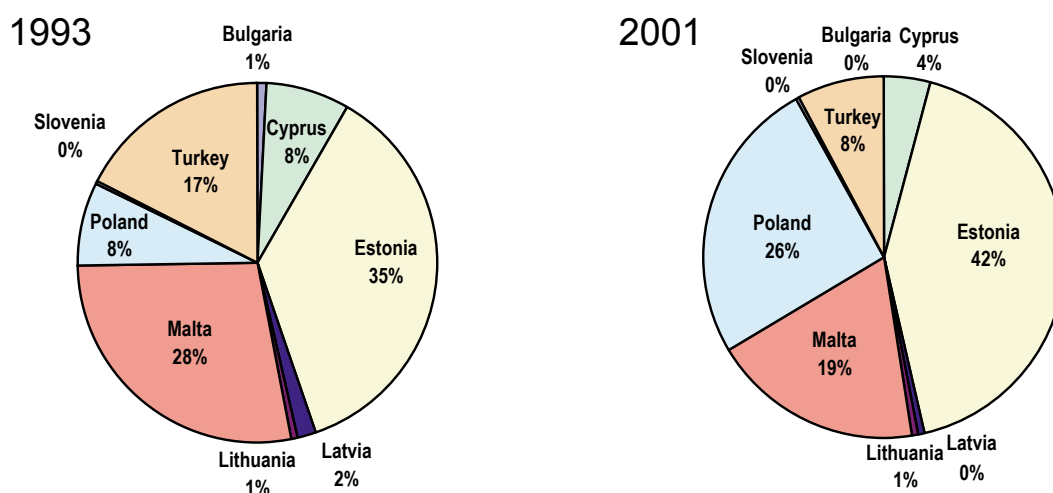
CZ: data refer to survey enterprises with 20 or more employees, in addition enterprises with less 20 employees are estimated.
 EE, HU: bus data includes urban transport
 LV, SI, TR: Rail data includes transit
 PL: bus data excludes small companies with 9 employees or less
 RO: Interurban and international transport of passengers
 SK: data consist only of transport enterprises enrolled in Business Register with 20 and more employees
 SI: data cover hire or reward transport, independent transporters are not included
 Source: Eurostat.

Graph 5.54: Candidate countries: evolution of passenger air transport (national, international arrivals and international departures) - in 1 000 passengers



Note: Estimates have been made for missing data, except for the national transport in Cyprus. The international figures do not exclude double counting between the candidate countries. Source: Eurostat.

Graph 5.55: Candidate countries: share by country in the volume of passengers carried in maritime transport - in %



RO: data not available ; LT: 1995 data used for 1993 Source: Eurostat.

EFTA countries

Data available for EFTA countries are presented in Table 5.56. In spite of the lack of data, figures (mostly available for Norway) suggest that the volume of passengers handled by rail transport keeps constant over the period observed. At the opposite, the three «road» modes of transport (passenger cars, motorcycles as well as bus and coaches) progressed over the same period.

Table 5.56: EFTA countries: evolution of passenger transport by mode - in million pkm

		1995	1996	1997	1998	1999	2000	2001
Rail	Iceland	-	-	-	-	-	-	-
	Liechtenstein	:	:	:	:	:	:	:
	Norway	2 381	2 449	2 561	2 590	2 674	2 520	2 592
	Switzerland	11 712	11 662	:	:	:	:	:
Passenger cars	Iceland	:	:	3 360	3 561	3 712	3 774	3 803
	Liechtenstein	:	:	:	:	:	:	:
	Norway	43 659	45 217	44 878	45 780	46 121	46 744	:
	Switzerland	:	:	:	:	:	:	:
Motorcycles	Iceland	:	:	0	0	0	0	0
	Liechtenstein	:	:	:	:	:	:	:
	Norway	724	768	840	924	1 000	1 065	:
	Switzerland	:	:	:	:	:	:	:
Bus and coaches	Iceland	:	:	433	458	468	476	479
	Liechtenstein	:	:	:	:	:	:	:
	Norway	3 752	4 117	4 248	4 424	4 424	4 424	:
	Switzerland	:	:	:	:	:	:	:

Source: Eurostat.

5.2.2. National passenger transport

The statistics on national passenger transport performances basically reflect the general EU trends described in Chapter 5.2.1. However, the situation differs notably when taking a closer look at the modal split and the daily performance in various countries. Since passenger transport by inland waterways does not play a significant role, except perhaps at a local level like for instance in and around Venice, the following paragraphs offer a first insight on national particularities of the three main motorised inland transport modes (passenger cars, buses and coaches and railways).

Furthermore, it should be noted that the tables indicating the passenger kilometres performed (Tables 5.57 to 5.59) apply to those on the national territory. This thus includes the national legs of international trips.

The second part of this chapter is dedicated to passenger transport by sea and air. Compared to the other transport modes, Eurostat's data collection on maritime and air transport is relatively recent. Passenger-kilometre indications for these two modes are not yet available; and the data presented for those modes refer to the number of passengers at arrival and departure.

The last part deals with the national transport of passengers by air and sea in the candidate countries, but also with the evolution of three inland modes for the EFTA countries (passenger cars, buses and coaches as well as motorcycles).

EU average: boosted by growth in Greece, Spain and Portugal

At EU-15 level, transport performance by car increased by 140 % between 1970 and 2000 (see Table 5.57 – outlining the transport performance on the national territory). As could be expected, transport performances developed particularly fast in Greece, Spain and Portugal, where both road network construction and car ownership developed rapidly compared to other Member States.

A more interesting picture is obtained when looking at the average number of kilometres performed by passenger cars in 2000: in Denmark, Luxembourg, France and Italy passenger car use appears to be the highest with an average performance between 11 500 and 12 500 km per person per year whereas the Greek, with an average of 7 310 km, obviously use their cars less. In addition, it should be noted that Greece only offers 304 cars per 1 000 inhabitants (EU-average: 469 — see Chapter 3 — *Means of transport*).

Table 5.57: Transport performed by passenger cars (1 000 million pkm)

	1970	1980	1990	1995	1996	1997	1998	1999	2000	2000 pkm per person per year
Belgium	41	65	89	97	98	99	103	105	106	10 363
Denmark	33	38	48	54	56	57	58	67	67	12 469
Germany	395	514	683	731	731	735	739	745	723	8 805
Greece	9	28	49	59	62	64	68	73	77	7 310
Spain	77	172	220	262	272	283	296	325	332	8 402
France	305	453	586	640	649	660	679	700	700	11 553
Ireland	11	18	18	23	25	27	29	31	33	8 801
Italy	212	324	523	615	627	639	663	663	665	11 532
Luxembourg	2	3	4	5	5	5	5	5	5	11 590
Netherlands	67	108	139	143	143	146	146	151	152	9 522
Austria	33	48	62	68	66	67	69	69	69	8 547
Portugal	14	29	41	61	66	71	76	82	87	8 647
Finland	24	35	51	50	50	52	53	55	56	10 763
Sweden	56	67	86	88	89	89	90	92	93	10 487
United Kingdom	304	396	600	609	619	628	630	626	625	10 469
EU-15	1 582	2 295	3 199	3 506	3 558	3 622	3 702	3 788	3 789	10 024
index 1970 = 100	100	145	202	222	225	229	234	239	240	
Modal share % (1)	73.8	76.4	79.2	79.5	79.3	79.2	79.1	78.9	78.3	

(1) Considered: passenger cars; buses and coaches; tram, metro and rail; air. Estimated in italics.

Sources: ECMT, national statistics, DG Energy and Transport studies and estimates (in italic).

Bus use: significant drop in the UK

Between 1970 and 2000, the average transport by buses and coaches in EU-15 has been increasing by 53.1%, arriving at a total of 413 billion pkm (see Table 5.58). Most countries present an increase of the performance of this mode, especially in the period 1970–90, with the exception of the United Kingdom, where a significant drop was registered. Some countries saw a sharp increase like Italy (+ 194 % between 1970 and 2000) and Portugal (+ 171 %).

With 94 billion pkm in 2000, Italy offers the highest figure in the EU in absolute terms — this corresponds to 4.5 km per person per day. It is however the Danish, Luxembourg and Greek population that travels more on bus and coach with 5.8, 5.6 and 5.6 km per day respectively. The high figure for Greece can partly be explained by a restricted rail network and the aforementioned low motorisation rate. The Danish figure corresponds almost to the double of the EU average (3.0 km).

Slow rail transport growth over the last decade

Compared to the other modes, transport performances of rail (on national territory) experienced only a modest increase: + 38 % at EU level between 1970 and 2000 (see Table 5.59). Since the early 1990s, growth has been

slow in most countries and a certain decrease can be observed in Greece, Italy, Austria and Portugal.

Compared to 1970 however, the number of passenger kilometres by rail progressed in all the Member States. Highest growth was achieved in Ireland and the Netherlands (around + 85 % for both countries).

It is on average the French who travel most by rail (3.1 km per person per day) in 2000, followed by the Austrians (2.8 km) and Danish (2.7 km). The EU-15 average in 2000 can be established at 2.2 km per person per day, a slightly higher value than the previous year (2.1 km).

In average, the EU citizen travels 32.6 km per day

Graph 5.60 presents the average daily distances travelled in 2000 using the three landborne transport modes. It should be noted that the use of tram and metro has not been considered. Furthermore, the figures are of course influenced by the availability (or non-availability) of transport modes. In many cases, there will be no modal choice for trips. However, the graph intends to give an impression on the availability and acceptance of the different modal networks.

With an average of 42.7 km per person per day in 2000, the Danes are by far the most mobile in the EU (considering distances travelled in passenger cars, trains and buses/coaches only,

Table 5.58: Transport performed by buses and coaches (1000 million pkm)

	1970	1980	1990	1995	1996	1997	1998	1999	2000	2000 pkm per person per year
Belgium (1)	9.3	9.1	10.9	<i>12.5</i>	<i>11.4</i>	<i>11.9</i>	<i>12.0</i>	<i>12.2</i>	<i>12.4</i>	<i>1 213</i>
Denmark	4.6	7.3	9.3	10.6	11.4	11.2	11.1	11.2	11.3	2 111
Germany	67.7	90.0	73.1	68.5	68.3	68.0	68.2	68.5	69.0	840
Greece	9.4	15.6	17.7	20.2	20.4	20.7	21.2	21.5	21.7	2 058
Spain	20.9	28.1	33.4	39.6	<i>44.0</i>	44.0	49.4	50.0	50.6	1 282
France	25.2	<i>38.0</i>	41.3	41.6	42.4	42.0	42.7	42.9	45.3	748
Ireland	3.3	4.5	3.9	5.2	5.3	5.5	5.7	5.9	6.1	1 613
Italy	32.0	57.8	84.0	87.1	88.7	90.0	90.6	92.5	94.0	1 630
Luxembourg	<i>0.8</i>	<i>0.8</i>	<i>0.9</i>	<i>0.9</i>	<i>0.9</i>	<i>0.9</i>	<i>0.9</i>	<i>0.9</i>	<i>0.9</i>	2 053
Netherlands	9.5	11.2	11.1	11.8	12.0	12.0	12.6	12.6	12.6	792
Austria	9.1	9.8	8.7	10.5	12.5	<i>12.5</i>	<i>12.7</i>	<i>12.9</i>	<i>13.1</i>	1 617
Portugal	4.4	7.6	10.3	11.3	11.1	11.6	11.6	11.5	11.8	1 182
Finland	7.5	8.5	8.5	8.0	8.0	8.0	7.8	7.6	7.7	1 488
Sweden	5.5	7.3	9.7	10.1	10.3	10.6	10.7	<i>11.0</i>	<i>11.1</i>	1 253
United Kingdom	60.2	52.2	46.2	44.3	44.2	44.2	45.0	45.0	45.0	754
EU-15	269.4	347.8	368.8	382.2	390.9	393.1	402.2	406.2	412.6	1 092
index 1970 = 100	100.0	129.1	136.9	141.9	145.1	145.9	149.3	150.8	153.1	
Modal share % (2)	12.6	11.6	9.1	8.7	8.7	8.6	8.6	8.5	8.5	

(1) from 1993 onwards extrapolation of 1992 result.

(2) Considered: passenger cars; buses and coaches; tram, metro and rail; air. Estimated in italics.

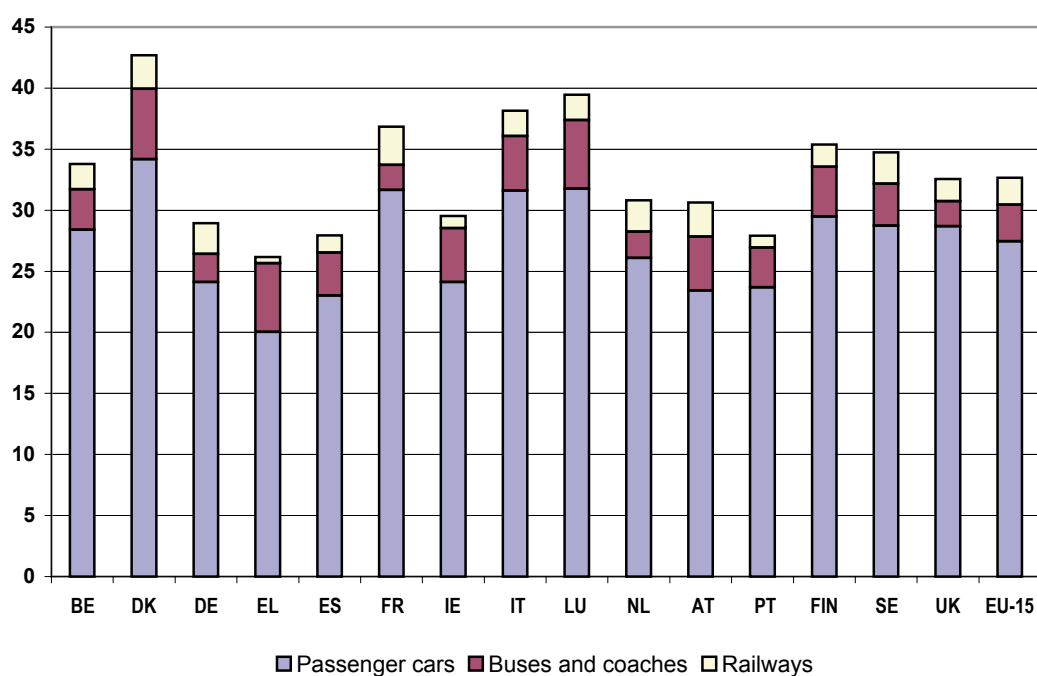
Sources: ECMT, Eurostat, national statistics.

Table 5.59: Transport performed by railways (1 000 million pkm)

	1970	1980	1990	1995	1996	1997	1998	1999	2000	2000 pkm per person per year
Belgium	7.6	7.0	6.5	6.8	6.8	7.0	7.1	7.4	7.8	758
Denmark	3.9	3.8	4.9	4.8	4.7	5.0	5.4	5.1	5.3	998
Germany	<i>62.4</i>	<i>62.5</i>	<i>61.1</i>	75.0	76.0	73.9	72.4	73.6	75.1	914
Greece	1.5	1.5	2.0	1.6	1.8	1.9	1.6	1.6	1.9	179
Spain	14.0	14.8	15.5	16.6	<i>16.9</i>	<i>17.9</i>	18.9	19.7	20.1	510
France	41.0	54.3	63.8	55.3	59.5	61.6	64.2	66.3	69.6	1 149
Ireland	0.8	1.0	1.2	1.3	1.3	1.4	1.4	1.5	1.4	367
Italy	32.6	39.6	44.7	43.9	44.8	43.6	41.4	43.4	43.8	759
Luxembourg	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	757
Netherlands	8.0	8.9	11.1	14.0	14.1	14.4	14.9	14.3	14.8	928
Austria	6.4	7.6	8.7	9.6	9.7	8.1	8.0	8.0	8.2	1 013
Portugal	3.5	6.1	5.7	4.8	4.5	4.6	4.6	4.3	3.6	363
Finland	2.2	3.2	3.3	3.2	3.3	3.4	3.4	3.4	3.4	658
Sweden	4.6	7.0	6.4	6.3	6.3	7.0	7.2	7.6	8.3	937
United Kingdom	30.6	30.4	33.2	30.2	32.3	35.0	36.5	38.7	39.4	660
EU-15	219.4	247.9	268.1	273.6	282.2	285.0	287.1	295.2	302.9	802
index 1970 = 100	100	113	122	125	129	130	131	135	138	
Modal share % (1)	10.2	8.2	6.6	6.2	6.3	6.2	6.1	6.1	6.3	

(1) Considered: passenger cars; buses and coaches; tram, metro and rail; air.
Estimated in italics.
Sources: UIC and national statistics.

Graph 5.60: Average daily distance travelled per person in 2000 (km)



Source: DG Energy and Transport.

excluding cycling and walking). Luxembourg follows with 39.5 km. The population in Greece and Portugal travels least with an average of 26.2 and 27.9 km respectively.

The share of rail in Greece is low and can partly be explained by a relatively poor rail network density (Greece: 17.4 km/1 000 km², EU-15 average: 48.3 km/1 000 km² — see Chapter 2.2 — *Physical characteristics of transport networks*).

Volume of domestic flight passengers often related to the geographical size of the country

As mentioned in the first section of this chapter, Eurostat's aviation data collection does not yet include passenger-kilometre (pkm) data.

The total number of passengers carried in domestic air transport in the various EU countries in 2001 can be estimated at close to 140 million. Table 5.61 indicates that large Member States obviously account for the highest passenger volumes. Smaller Member States like the Netherlands and Belgium display very low passenger figures or none at all (Luxembourg). It should be noted that certain countries feature islands or island groups that are at considerable distance from the mainland, such as the Canary Islands (Spain) or Madeira and the Açores (Portugal). Also, domestic air passenger transport declared by France includes the traffic with the overseas territories (Réunion, French Guyana, Guadeloupe and Martinique). The relatively high passenger figure for Greece can be explained by the impressive amount of islands offering air connections with the mainland. The considerable volume registered in Sweden is due to the large area of the country (third largest EU country after France and Spain).

Table 5.62: Top 30 airports in domestic air transport, 2001

Rank	Airport	Number of passengers (in 1000)	Evolution 2000/2001
1	Paris-Orly / F	17 246	:
2	Madrid-Barajas / E	17 225	3.6%
3	Roma-Fiumicino / I	12 155	-3.2%
4	Barcelona / E	10 553	4.6%
5	München / D	8 225	-0.5%
6	Frankfurt (Main) / D	8 185	-5.7%
7	Stockholm-Arlanda / S	6 724	-0.5%
8	London-Heathrow / UK	6 635	-10.4%
9	Berlin-Tegel / D	5 489	-8.1%
10	Milano-Linate / I	4 996	19.2%
11	Paris-Charles-de-Gaulle / F	4 957	:
12	Palma de Mallorca / E	4 843	0.8%
13	Milano-Malpensa / I	4 410	-20.3%
14	Nice-Côte d'Azur / F	4 308	-11.1%
15	Edinburgh / UK	4 256	10.1%
16	Hamburg / D	4 102	-3.9%
17	Marseille-Marignane / F	3 831	-11.5%
18	Glasgow / UK	3 828	11.2%
19	Toulouse - Blagnac / F	3 612	-5.0%
20	Düsseldorf / D	3 611	-7.8%
21	Helsinki / FIN	2 999	-1.5%
22	London-Gatwick / UK	2 979	2.3%
23	Las Palmas-Gran Canaria / E	2 968	2.7%
24	Catania-Fontanarossa / I	2 948	-5.6%
25	Manchester-International / UK	2 820	-1.4%
26	Palermo-Punta Raisi / I	2 803	3.2%
27	Köln-Bonn / D	2 715	-7.3%
28	Lyon-Satolas / F	2 687	0.8%
29	Belfast-Aldergrove / UK	2 611	19.4%
30	Napoli-Capodichino / I	2 501	-5.1%

Source: Eurostat.

Table 5.61: Development of domestic air passenger transport 1995-2001 (in 1000 passengers)

	1995	1996	1997	1998	1999	2000	2001
Belgium	1.1	1.1	0.6	2.9	4.0	8.1	3.1
Denmark	2 641.1	2 806.4	2 703.8	:	:	:	1 800.4
Germany	17 832.2	17 598.4	18 737.5	19 875.5	20 288.7	22 075.8	20 920.3
Greece	:	:	:	4 391.4	5 169.0	6 111.4	:
Spain	:	:	:	:	25 148.2	28 884.2	29 688.0
France	:	:	26 592.0	28 517.0	30 413.2	30 813.5	28 555.6
Ireland	439.5	469.3	447.4	:	552.6	666.9	674.0
Italy	15 428.4	17 095.2	19 770.7	:	20 601.0	22 935.1	22 486.6
Luxembourg	-	-	-	-	-	-	-
Netherlands	157.5	185.9	198.7	204.6	180.0	211.3	185.8
Austria	384.8	411.7	428.6	475.4	501.4	545.3	558.9
Portugal	1 708.9	1 761.8	1 873.8	2 108.4	2 565.3	2 821.8	2 937.1
Finland	:	:	:	2 993.0	2 855.0	3 121.9	3 058.0
Sweden	6 875.7	6 604.4	6 819.6	7 260.6	7 695.8	8 043.0	8 086.5
United Kingdom	14 100.0	15 300.0	16 000.0	16 800.0	17 500.0	19 500.9	20 788.8

Sources: Eurostat, national statistics (UK 1995-1999).

Table 5.63: Maritime transport: passengers registered in the main ports in national traffic, 2001

	Passengers carried (1000)	Share in total traffic (%)
Belgium	10	1
Denmark	8 384	23
Germany	7 043	36
Greece	35 228	96
Spain	10 472	81
France	5 348	20
Ireland	2	0
Italy	40 866	88
Netherlands	0	0
Portugal	443	99
Finland	569	4
Sweden	1 308	4
United Kingdom	4 018	13

Source: Eurostat.

Keeping in mind the very different passenger volumes forwarded in domestic air transport, Table 5.62 shows the 30 most important individual airports on the basis of domestic air passengers. Paris-Orly is the first airport with 17.25 million domestic passengers, closely followed by Madrid-Barajas (17.23 million). Roma-Fiumicino and Barcelona are the only two other

airports in the EU handling over 10 million domestic air passengers.

Italian mainland – Sicily is by far the most important national ferry-route

The characteristics of national maritime transport of passengers in the individual Member States appear to be quite heterogeneous. Based on relatively recent EU reporting requirements, a near full set of data on national passenger transport is available for 2001. As outlined in the previous chapter (Graph 5.50) and presented in the second column of Table 5.63, the share of national transport can be substantial: this is notably the case for Spain, Italy and especially Greece and Portugal. As for air transport, the geographical characteristics (islands) often explain the high volumes. The numerous islands of Greece and Denmark, the Balears and Canary Islands for Spain and the Madeira and Açores archipelago for Portugal explain the relatively high passenger figures. One figure however excels: Italy registered close to 40 million passengers in its ports (in national transport). Unlike Greece with numerous connections, only a couple of important ferry services are responsible for the impressive Italian number, notably the link Reggio Calabria – Messina (linking the Italian mainland and Sicily) and the ports of Napoli and Capri, also offering frequent connections, mainly during the holiday season. An important part of the 7 million persons registered in German ports were counted in the small port of Norddeich (German North-Sea coast), mainly heading for the island of Norderney, a popular holiday resort.

Candidate countries

Table 5.64 outlines that only the geographically larger candidate countries register noticeable volumes of domestic air passengers. Between 1993 and 2001, the volume in Poland increased the most with a growth of 250%, well before Turkey (36%). The opposite is true for Bulgaria, Lithuania and the Slovak Republic, where an important decrease was registered; however, the absolute numbers in these countries are relatively small. Surprising when considering the size of the country is the 51 000 passengers reported on Malta: they go to the account of helicopter traffic between the main island and the small island of Gozo.

Islands explain maritime passenger transport for Estonia and Malta

Table 5.65 indicates that (on the basis of available data) noticeable national sea transport only occurs in Malta and Estonia. For Malta, this can be explained (as for air transport) by the ferry connections with the neighbouring island of Gozo, and for Estonia by the fact that the country has some larger islands (notably Hiiumaa and Saremaa).

Table 5.64: Candidate countries: national passenger transport by air (in 1000 passengers)

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Bulgaria	141	89	92	81	69	81	86	75	26
Cyprus	:	:	:	:	:	:	:	:	:
Czech Republic	137	96	52	66	62	49	54	34	52
Estonia	19	5	4	3	10	9	22	19	15
Hungary	-	-	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-	-	-
Lithuania	:	:	3	2	2	2	1	1	1
Malta	:	:	:	44	48	50	48	54	51
Poland	384	479	588	739	822	865	920	1 037	1 334
Romania	:	:	:	:	341	330	282	293	302
Slovak Republic	:	:	:	24	23	25	14	14	10
Slovenia	0	0	0	1	1	0	0	0	0
Turkey	7 394	8 784	10 355	10 862	12 414	13 239	12 932	13 339	10 058

SK: data consist only of transport enterprises enrolled in Business Register with 20 and more employees.

MT: National passenger transport include passengers crossings to Gozo via helicopter.

Source: Eurostat.

Table 5.65: National passenger transport by sea (in 1000 passengers)

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Bulgaria	70	51	18	20	21	7	-	-	-
Cyprus	:	:	:	:	:	:	:	:	:
Czech Republic	-	-	-	-	-	-	-	-	-
Estonia	949	870	1 073	983	1 108	1 168	1 271	1 241	1 330
Hungary	-	-	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-	-	-
Lithuania	-	-	-	-	-	-	-	-	-
Malta	2 406	2 747	2 750	2 749	2 743	2 716	2 957	3 069	3 178
Poland	-	-	-	-	-	-	-	-	-
Romania	:	:	:	:	:	:	:	:	:
Slovak Republic	-	-	-	-	-	-	-	-	-
Slovenia	3	4	15	2	7	3	0	1	2
Turkey	506	577	599	477	596	688	95	85	142

Source: Eurostat.

EFTA countries

Some figures for the EFTA countries are presented in Table 5.66 for the national transport by motorcycles, passenger cars and bus and coaches. Even if data availability does not allow the coverage of the evolution of each mode since 1993, the table highlights that there is an increasing trend for all the inland modes throughout the period covered.

Table 5.66: Transport performed by motorcycles, passenger cars and bus and coaches in the EFTA countries (million pkm)

		1990	1995	1996	1997	1998	1999	2000	2001
Motorcycles	Iceland	:	:	:	0	0	0	0	0
	Norway	705	724	768	840	924	1 000	1 065	:
	Switzerland	1 393	:	:	:	:	:	:	:
Passenger cars	Iceland	:	:	:	3 360	3 561	3 712	3 774	3 803
	Norway	42 466	43 659	45 217	44 878	45 780	46 121	46 744	:
	Switzerland	73 271	:	:	:	:	:	:	:
Buses and coaches	Iceland	:	:	:	433	458	468	476	479
	Norway	3 890	3 752	4 117	4 248	4 424	4 424	4 424	:
	Switzerland	:	:	:	:	:	:	:	:

Switzerland: includes foreign vehicles.

Source: Eurostat.

5.2.3 International passenger transport

Unlike the international transport of goods, data availability on international transport of passengers is not completely covered by various EU legal acts on the statistical returns from the transport sector. This is notably the case for road, inland waterway and rail transport. International transport by inland waterways is anyhow very limited. The previous chapter offered an overview of the amount of passenger kilometres of passenger cars, buses and coaches as well as railways performed on the national territory. It is recalled that these figures include the national legs of international journeys.

Data availability poorer for passenger transport

For statistical returns from the maritime and air transport domain however – covered by relatively recent legal acts – detailed data on passenger transport are available. Subsequently, this chapter will focus on those two transport domains. Data can not yet be expressed in the shape of passenger-kilometres performed (which usually offers a good impression of quantity and distance covered) but rather on the basis of the number of passengers carried. Detailed information on the various transport links offer nevertheless quite a good overview of the situation in these sectors.

Double counting for intra-EU transport

It is estimated that around 150 million passengers have passed through port installations in the EU. Table 5.67 outlines that the numbers in international intra-EU are far higher than those registered in international extra-EU transport. There are basically two reasons for this: double counting in intra-EU transport applies since passengers are counted once by the port authority upon embarkation and another time (by another EU Member State) upon disembarkation. This double counting is avoided in extra-EU transport where EU port authorities register passengers only once (either embarking or disembarking – and referring to different journeys). The second reason is the fact that a very high share of the passengers is registered on the main European ferry routes, which are nearly all intra-EU connections.

Keeping this in mind, it appears that for total transport, Sweden registered the highest number of passengers (30 million), before the United Kingdom and Denmark (both with 28 million).

By merely looking at the difference in passenger numbers in intra- and extra-EU passenger numbers a rough pattern can be identified. The high intra-EU passenger numbers for Sweden and Denmark for instance go to the account of the various important ferry links (for Denmark these

Table 5.67: International maritime passenger traffic 2001: passengers counted in ports - by country

	International intra-EU transport - Number of passengers (1000)	International extra-EU transport - Number of passengers (1000)	Total international transport - Number of passengers (1000)
Belgium	1 348	1	1 349
Denmark	23 746	4 049	27 795
Germany	10 754	1 595	12 349
Greece	1 396	55	1 451
Spain	1 223	1 183	2 406
France	19 761	1 090	20 851
Ireland	2 650	0	2 650
Italy	3 993	1 503	5 496
Luxembourg	0	0	0
Netherlands	2 039	2	2 041
Austria	0	0	0
Portugal	2	3	5
Finland	9 151	6 182	15 333
Sweden	27 007	2 742	29 749
United Kingdom	27 553	283	27 836

Source: Eurostat.

are mainly those with Sweden and Germany, for Sweden those with Denmark, Germany and Finland). The high figures for the United Kingdom and France suggest the intensive (intra-EU) cross-channel traffic.

Cross-Channel traffic remains most important

This pattern can be confirmed by looking at the information displayed in Table 5.68, which details the top-20 routes in international maritime passenger transport (both intra- and extra-EU transport). Unlike air transport, detailed information on port-to-port transport cannot be disclosed. Thus, Table 5.68 outlines port to/from -MCA (Maritime Coastal Area) information. The cross-Channel passenger transport can be found in the two first positions as well as position 10 and the traffic across the Øresund between Denmark and Sweden mainly in positions 3, 4, 13 and 14. It should be noted that for reasons of statistical confidentiality, port-to-port figures may not be revealed and that Table 5.68 should only be read line by line. Summing up various lines should be avoided since the same passengers could be counted twice, once as inwards, and once as outwards).

Within the top-20, only three port-to/from-MCA relations refer to extra-EU passenger transport: the relatively short distances between Helsinki and Estonia (rank 6) and Algeciras and Morocco (rank 15) and the Hirtshals (in the very north of Denmark) – Norway relation.

September 11th effect: –2% in international air transport between 2000 and 2001

The impact of the September 11th is clearly highlighted in Table 5.69. Since many years, the international transport has been constantly increasing with an average annual growth of 7.8% between 1993 and 2000. The massive decrease of the passenger transport during the last quarter of 2001 is responsible for the overall decrease of 2.2 % registered for that year.

The table indicates that the effects of the September 11th events affect all the individual countries, as the annual growth between 2000 and 2001 appeared always lower than the average evolution between 1993 and 2000.

Despite lower growth rates between 2000 and 2001 as compared to the long-term average, some countries still registered positive evolutions: Ireland comes first with +3.9%, followed by Spain (+2.7%) and Finland (+1.4%). The opposite is true for Belgium, where the international passenger transport decreased by 8.3%. The development in Belgium was however further influenced by the bankruptcy of a major Belgian carrier.

Highest extra-EU shares for countries with long-haul 'gateways'

Taking into account international departures and arrivals, the share of intra-EU transport is high in most countries: in general over 60% except for Germany, France and the Netherlands (see Graph 5.70). The countries displaying the highest extra-

Table 5.69: Total international air passenger transport: development by country

	Change 2000-2001 (%)	Average annual growth 1993-2000 (%)
EU-15	-2.22	+7.80
Belgium	-8.34	+11.57
Denmark	:	:
Germany	-1.37	+6.98
Greece	:	+5.14
Spain	+2.68	+8.76
France	+0.43	+7.04
Ireland	+3.88	+16.34
Italy	-2.03	+9.37
Luxembourg	-2.22	+6.69
Netherlands	-2.48	+9.91
Austria	-0.58	+7.62
Portugal	-0.62	+7.26
Finland	+1.41	:
Sweden	-0.69	+17.67
United Kingdom	-0.39	+7.45

Source: Eurostat.

EU shares coincide with those having Europe's major airports considered as gateways for intercontinental and long-haul air traffic, like Paris/Charles de Gaulle, Amsterdam/Schiphol and Frankfurt-Main. The United Kingdom, with a share of international intra-EU transport of 62% can be associated to the previous mentioned countries, as London/Heathrow registers a high share of long-distance transport.

Graph 5.71 visualises the overall growth of international air transport and in the meantime gives an impression of the structure of the main relations. About half (52 %) of the international passengers are travelling on intra-EU flights (to avoid double counting (at departure and arrival) for the figure at EU-level, international intra-EU passengers are only counted in the departure country). Amongst the passengers on extra-EU flights, relations with other European countries than those of the EU (32 % of the total) as well as North America (25 %) dominate.

The shares of the individual countries in the total extra-EU passenger transport vary considerably. The first row of Table 5.72 expresses the total share of the Member States in extra-EU passenger figures. With 27 %, the UK leads by a substantial margin, followed by Germany and France with 22 % and 16% respectively.

France first in air traffic with Africa

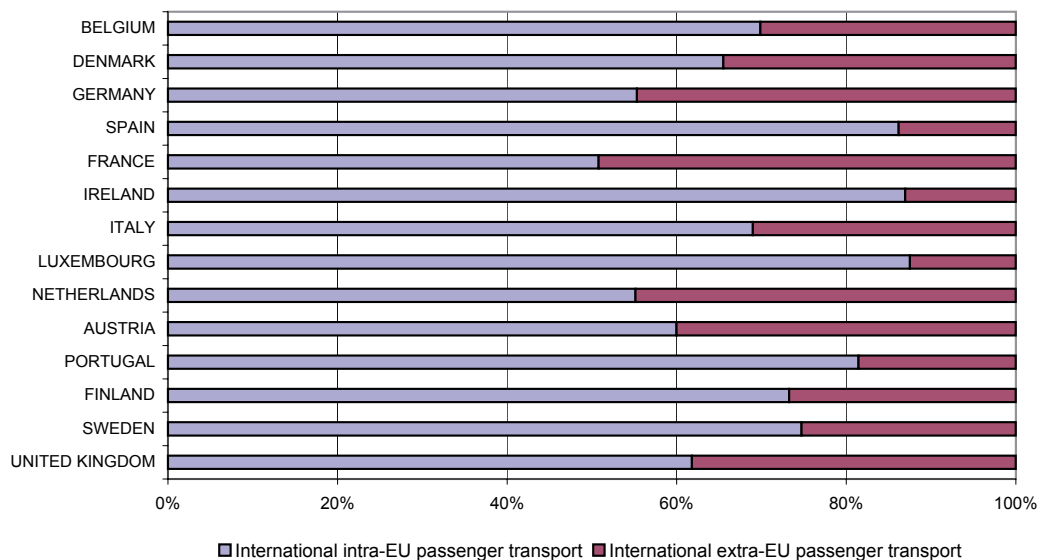
Germany leads in traffic to non-EU European countries with 28 % of the passenger carried, well in front of the United Kingdom with 20 %. Instead, the UK has still a clear dominance in

Table 5.68: Top 20 routes in international maritime passenger transport, 2001 (1000 passengers)

	Between: Port	and: Maritime Coastal Area	Inwards	Outwards	Total
1	Dover / UK	France: Atlantic and North Sea	7 449	7 536	14 985
2	Calais / F	United Kingdom	7 220	7 147	14 366
3	Helsingborg / S	Denmark	5 755	5 943	11 698
4	Helsingor / DK	Sweden: Baltic	5 768	5 745	11 513
5	Stockholm / S	Finland	3 272	3 360	6 632
6	Helsinki / FIN	Estonia	3 023	3 006	6 029
7	Rodby / DK	Germany: Baltic	3 057	2 971	6 028
8	Puttgarden / D	Denmark	2 971	3 013	5 984
9	Turku / FIN	Sweden: Baltic	1 773	1 762	3 535
10	Portsmouth / UK	France: Atlantic and North Sea	1 554	1 569	3 123
11	Helsinki / FIN	Sweden: Baltic	1 324	1 302	2 626
12	Holyhead / UK	Ireland	1 190	1 190	2 380
13	Frederikshavn / DK	Sweden: North Sea	999	1 001	2 000
14	Göteborg / S	Denmark	999	1 000	1 999
15	Algeciras / E	Morocco: West Africa	930	991	1 921
16	Mariehamn / FIN	Sweden: Baltic	935	937	1 872
17	Hirtshals / DK	Norway	868	825	1 693
18	Rotterdam / NL	United Kingdom	788	785	1 573
19	Cherbourg / F	United Kingdom	705	709	1 414
20	Dublin / IRL	United Kingdom	692	684	1 377

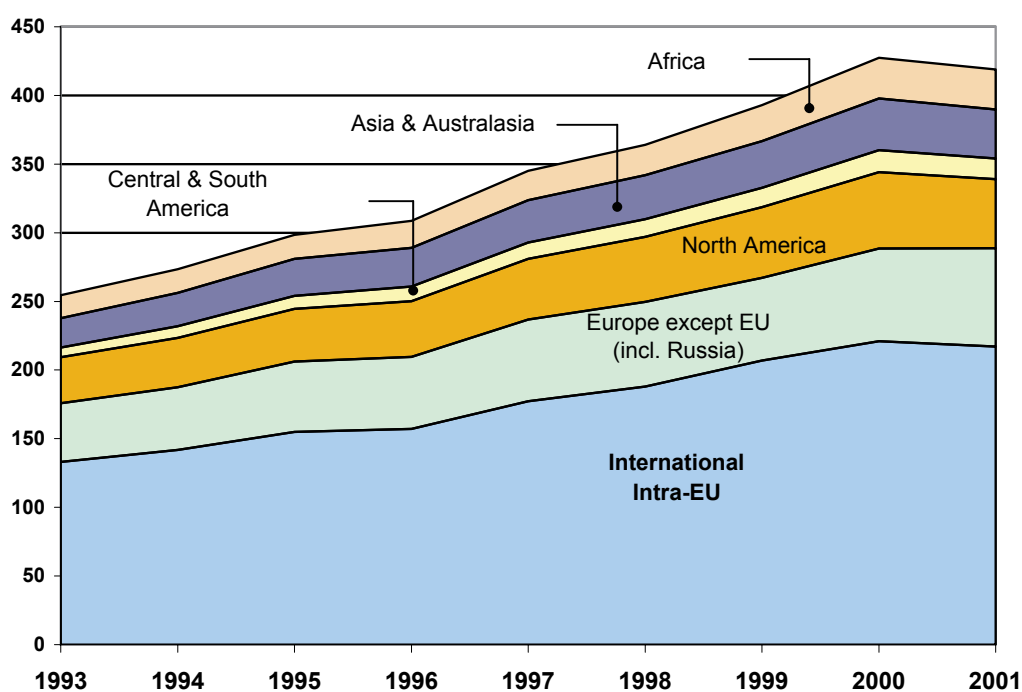
Source: Eurostat.

Graph 5.70: Distribution between international intra-EU and extra-EU passenger transport by air in 2001



Source: Eurostat.

Graph 5.71 : Development of international passenger air transport by world region between 1993 and 2001 (million passengers)



Source: Eurostat.

traffic with America (36 %) although the share slightly dropped since 1999 (37.7 %). The UK is followed by Germany, France and the Netherlands.

The same ranking prevails for traffic with Asia and Australasia, for which 84% of the total transport is handled by four countries: United Kingdom (34.3 %), Germany (21.9 %), France (15.8 %) and the Netherlands (11.8 %).

As in previous years, France holds the first position in traffic with Africa. It should however be said that the high share of 34 % is mainly due to important traffic with North African destinations. If North Africa would be considered separately, the French share would be even higher. Germany comes second with 17 % followed by the United Kingdom (16 %) and Italy (11 %).

Share of extra-EU transport with non-EU Europe more and more important

Graph 5.73 turns back to extra-EU transport at the level of the entire EU, with however a more detailed view on 'world destinations'. The main share in extra-EU air transport in 2001 is taken by non-EU European countries (32 % - European Republics of the ex-USSR not considered) followed by North America (25 %). In 2000, the share of extra-EU transport with non-EU Europe was only 29 %.

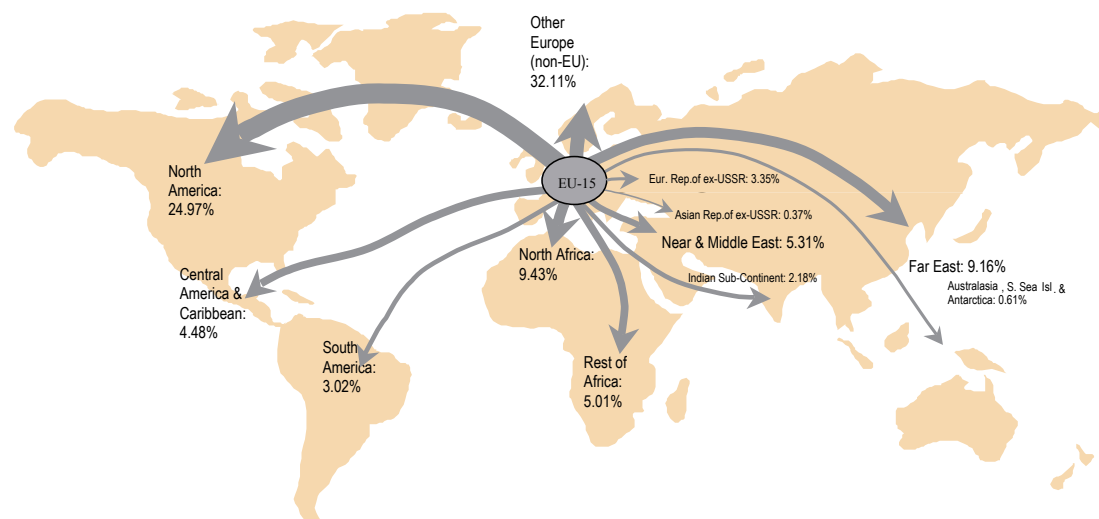
The African continent accounts for 14 % of extra-EU traffic; however, North Africa alone (with popular holiday destinations in Morocco and Tunisia) is responsible for 9 % of this share. Far-East destinations account for 9 %, the Near and Middle East for nearly 5 % of the traffic. All other destinations have a share of under 5 %

Table 5.72: Extra-EU passenger air transport to world regions in 2001 : shares of individual Member States (%)

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	EU-15
Total	3.0	3.1	21.5	:	5.7	16.1	1.1	6.7	0.1	8.8	2.8	1.2	1.0	2.0	26.9	100
Europe except EU	3.5	6.3	27.8	:	7.1	9.0	0.7	5.8	0.2	7.3	5.1	1.1	2.0	4.2	19.9	100
America	2.3	1.0	16.5	:	7.7	14.8	2.4	6.1	0.0	10.1	0.7	1.8	0.3	0.7	35.6	100
Asia & Australasia	1.3	2.4	21.9	:	1.3	15.8	0.0	6.1	0.0	11.8	3.0	0.0	1.0	1.2	34.3	100
Africa	5.1	0.6	17.2	:	3.4	36.6	0.3	10.6	0.2	5.7	1.7	1.6	0.3	0.8	15.8	100

NB: No data available for Greece.
Source: Eurostat.

Graph 5.73: Extra-EU passenger air transport 2001: share in world destinations



Source: Eurostat.

Table 5.74: Top-15 airports - Total passengers carried in international intra-EU transport

Rank 2001	Airport	Total pass. carried 2001	Change 2000-2001 (%)	Rank 2000
1	London/Heathrow	23 052 932	-5.4	1
2	Amsterdam/Schiphol	21 524 630	+1.1	3
3	Paris/Charles-De-Gaulle	19 621 323	:	:
4	Frankfurt (Main)	16 843 305	+0.4	4
5	London/Gatwick	15 107 785	+1.3	6
6	Brussels/National	13 824 377	-8.2	5
7	Palma de Mallorca	13 531 941	-1.5	7
8	Dublin	12 023 037	+3.7	8
9	Manchester Internat.	11 491 546	+7.0	9
10	London/Stansted	10 780 150	+11.9	11
11	Copenhagen/Kastrup	10 435 350	:	:
12	Madrid/Barajas	10 371 810	+5.8	10
13	Munich	9 363 845	+2.2	12
14	Stockholm/Arlanda	8 392 680	+0.7	13
15	Barcelona	8 167 995	+7.8	16

NB: No data available for Greece.
Source: Eurostat.

Table 5.75: Top-15 airports - passengers carried in extra-EU transport

Rank 2001	Airport	Total pass. carried 2001	change 2000-2001 (%)	Rank 2000
1	London/Heathrow	30 759 949	-5.4	1
2	Paris/Charles-De-Gaulle	23 339 410	:	:
3	Frankfurt (Main)	23 166 976	-1.5	3
4	Amsterdam/Schiphol	17 630 658	-1.0	4
5	London/Gatwick	13 012 141	-7.9	5
6	Milano/Malpensa	6 629 668	-5.7	6
7	Madrid/Barajas	6 273 163	-0.2	8
8	Brussels/National	5 961 482	-8.6	7
9	Copenhagen/Kastrup	5 840 256	:	:
10	Munich	5 824 315	+7.0	10
11	Vienna/Schwechat	4 902 617	+0.9	11
12	Manchester/Intern.	4 756 954	+0.8	12
13	Rome/Fiumicino	4 468 206	-23.2	9
14	Düsseldorf	4 222 568	+1.6	13
15	Stockholm/Arlanda	3 364 628	-4.0	14

NB: No data available for Greece.
Source: Eurostat.

International intra-EU transport less affected by general decline

Considering either international intra-EU or international extra-EU passenger transport, the airport of London / Heathrow remains by far the busiest airport.

Table 5.74 displays the 15 busiest airports in intra-EU passenger transport in 2001. The ranking is based on the total number of passengers at arrival and departure within the EU, both in scheduled and non-scheduled traffic. Compared to 2000, the 2001 ranking of the first 10 airports did not change much.

The effects of the September 11th tragedy are less felt in international intra-EU transport: even though the annual evolutions are lower than expected for most airports, 10 out of the 13 airports for which the evolution is available have registered an increase of their international intra-EU passengers compared to 2000. London/Stansted is up by 12 %, followed by Barcelona (+ 8 %) and Manchester (+7 %). The decrease of

London/Heathrow may be due to a change of the distribution of the passenger transport at the various London airports. If the London airports would be taken together, this «airport system» would present an increase of 0.4% between 2000 and 2001.

The picture is different for the international extra-EU passenger transport, presented in Table 5.75, where 9 out of the 13 evolutions available were negative. The ranking did not change much compared to 2000, with the exception of Roma/Fiumicino (-23.2 %), the most affected airport of the top-15, changing from rank 9 in 2000 to rank 13 in 2001. At the opposite, Munich registered by far the biggest increase, with 7%. As mentioned earlier, the number of passengers on non-EU European routes have considerably increased in 2001 compared to 2000; and the airports that registered positive developments largely correspond to those offering such routes (Munich, Vienna, Düsseldorf).

Candidate Countries

The transport performance of the candidate countries in terms of maritime and air transport are outlined in Table 5.76 and 5.77. Maritime transport of passengers in this country group is clearly dominated by two countries: Estonia, with 6.0 million passengers (representing 47.4% of the total of the candidate countries) and Poland, with 4.4 million passengers (35.1%).

Estonia's maritime passengers mainly to and from Helsinki

A very large part of Estonia's passengers goes to the account of the relatively short trip to Helsinki/Finland. Poland offers various ferry services across the Baltic, especially through the ports of Swinoujscie and Gdynia. Almost the entire transport is covered when Turkey's share (9.5%) and that of Cyprus (5.7%) are also considered.

Table 5.77 highlights air transport in the Candidate Countries. Turkey comes first, with 23 million passengers, representing a share of 42% in the total transport by air in the candidate countries. This high share can be explained by Turkey's many popular holiday-destinations. If domestic air transport would also have been considered, Turkey's share in total passenger transport by air would have been close to 50%.

Table 5.76: Candidate countries: international passenger transport by sea - in 1000 passengers

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Bulgaria	-	-	-	-	-	-	-	-	-
Cyprus	731	835	787	685	717	737	824	1 035	719
Czech Republic	-	-	-	-	-	-	-	-	-
Estonia	2 503	2 569	4 273	4 512	5 026	5 589	6 072	6 192	5 957
Hungary	-	-	-	-	-	-	-	-	-
Latvia	148	110	98	34	61	101	75	77	72
Lithuania	:	:	58	63	70	77	78	106	101
Malta*	231	229	217	200	153	202	175	94	88
Poland	723	882	989	1 353	2 170	2 309	3 117	4 465	4 417
Romania	:	:	:	:	:	:	:	:	:
Slovakia	-	-	-	-	-	-	-	-	-
Slovenia	36	38	25	30	37	38	38	37	32
Turkey	1 149	1 225	1 249	1 211	1 422	1 132	967	1 195	1 189

* data for 2000 and 2001 are estimated.
Source: Eurostat.

Table 5.77: Candidate countries: international passenger transport by air - 1000 passengers

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Bulgaria	:	:	2 217	2 204	2 261	2 284	2 131	2 093	2 552
Cyprus	3 894	4 336	4 580	4 337	4 578	5 004	5 465	6 029	6 415
Czech Republic	1 221	1 622	1 805	1 916	2 104	2 328	2 850	3 450	3 894
Estonia	:	:	:	:	:	:	547	559	569
Hungary	2 420	2 865	2 936	3 314	3 619	3 941	4 325	4 697	4 595
Latvia	310	393	491	497	532	556	564	576	624
Lithuania	:	:	418	434	479	527	541	580	650
Malta	2 183	2 565	2 541	2 565	2 753	2 875	2 985	3 005	2 806
Poland	2 131	2 345	2 686	2 871	3 370	4 036	4 327	4 705	4 970
Romania	:	:	:	:	1 583	1 696	1 795	2 065	2 201
Slovak Republic	:	:	:	128	158	208	154	145	186
Slovenia	422	504	649	678	727	807	916	1 012	906
Turkey	13 271	13 550	17 430	19 918	21 982	20 960	17 080	21 633	23 563

CZ, EE, LV: Passenger total includes transit.
BG: only public sector enterprises. Figures include transit for the period 1995-1999
SK: data consist only of transport enterprises enrolled in Business Register with 20 and more employees.
HU: Non-commercial services included.
TR: number of departures and arrivals in external lines reported to the General Directorate of State Airports.
Source: Eurostat.

EFTA Countries

The international rail transport performance of Norway and Switzerland is displayed in Table 5.78. On the basis of available data, a decreasing trend can be observed: despite an unsteady development, Norway has lost 53 % when 2000 is compared to 1990 and Switzerland's passenger volume decreased by 27% during the 1990-1996 period.

Table 5.78: EFTA countries: volume of international passenger transport by rail - in 1000 passengers

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Norway	299	211	241	238	168	134	130	110	116	120	140
Switzerland	8 195	8 821	8 847	8 651	7 866	6 744	5 953	:	:	:	:

Source: Eurostat.

6. Transport safety

Traffic accidents (considering road, rail, air and maritime traffic) claimed about 41 500 lives in the EU in 2000. More than forty times as many were injured.

Road accidents accounted for the vast majority (98%) of fatalities. For people under 45, road accidents remain the prime cause of mortality. However, the level of road deaths needs to be considered against the background of the strong rise in road traffic. While road traffic at Community level more than doubled between 1970 and 2000, the number of fatal casualties decreased by 48 % (see Graph 6.1). Within this overall decline however, there were important differences between the trends in individual Member States.

The number of fatalities in rail accidents is relatively low. At Community level, the absolute number of fatal casualties fluctuated between 1 000 and 1 500 victims since the early 1980s and since the second half of the 1990s, it persisted under the bar of 1 000 deaths per year. A slight tendency towards a further decline can be observed but figures continue to vary from year to year (see Graph 6.2). A single major accident can seriously influence the statistics.

The following paragraphs highlight the situations in the individual Member States. Due to the diverging definitions of 'injured persons', the analysis is limited to the number of deaths (see note of Table 6.3).

Late decline for Portugal

A large number of measures for increased road safety have been taken in the past — both at Community, national and local level: improved

road design, more motorways (for the same distance travelled, motorways are much safer than any other roads) higher safety standards, better monitoring of the roadworthiness of the vehicle fleet and a stricter legislation on drink-driving are only a few examples.

Since the beginning of the 1970s, a general downward trend has been predominant in the EU. Only in Greece, Spain and Portugal, where the number of cars has been rapidly increasing, was this tendency not followed. A significant decline was registered in Spain from the early 1990s, in Portugal from the mid-1990s onwards.

Still 40 000 deaths in 2000

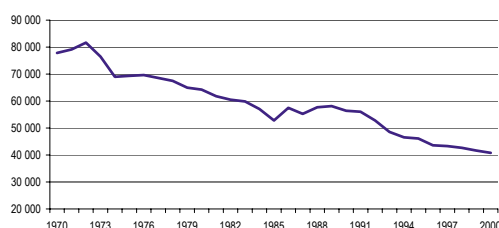
Table 6.3 shows that the total number of road accident fatalities at Community level decreased from 56 414 in 1990 to 40 812 in 2000. This is a decrease of nearly 28 % in a single decade. Greece and Luxembourg are the only countries where the number of road fatalities did not show a downward trend during the last 10 years.

Ireland and Italy close to EU average

Table 6.4 outlines that in 2000, the United Kingdom recorded the lowest number of deaths per million inhabitants (60), followed by Sweden (67) and the Netherlands (68). On the other extreme, Greece's rate is more than three times higher (198). Ireland and Italy display figures close to the EU-15 average (109). In 1990, the EU average stood at 155.

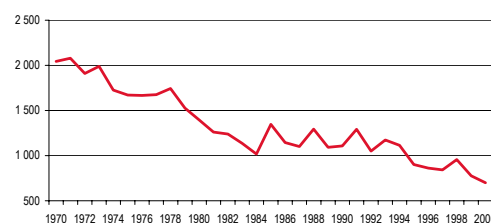
Graph 6.5 (EU-15) and Table 6.6 (by Member State) show the number of fatal casualties per 1 000 million passenger kilometres travelled. The

Graph 6.1: Number of persons killed in road accidents - EU-15



Source: Eurostat.

Graph 6.2: Number of persons killed in accidents involving railways - EU-15



Source: UIC.

United Kingdom, Sweden, Finland Denmark and the Netherlands display the lowest number of deaths per 1 000 million passenger-kilometres travelled.

Pedestrians over 65 most at risk

In 2000, 55% of all road accident fatalities were the drivers and passengers of passenger cars, 23 % cyclists and drivers and passengers of powered two-wheelers (see Graph 6.7). Pedestrians hurt in car accidents account for 16 % of the fatalities. Among the pedestrians, the age group of 65 and over continues to be the most at risk.

Rail accident victim often not a rail passenger

The situation differs for accidents linked to railways. Graph 6.5 displays how the number of deaths per 1 000 million passenger-kilometres travelled have been decreasing at Community

level since 1970. Tables 6.8 and 6.9 show the same information at Member States level for the period 1990–99.

Graph 6.5 and Table 6.9 indicate that only a minority of rail accident fatalities is actually passengers travelling in trains. Most fatalities have been recorded in accidents occurring at railway level crossings and in shunting procedures as well as track maintenance works where no passengers travelling in the trains died. This should be taken into account when looking at Graph 6.2 and Table 6.8.

Expressed in passenger-kilometres travelled, it then appears that at Community level, rail transport is 24 times safer for the drivers and passengers in passenger cars (1999). A single major accident, like the one involving a high-speed train in Germany in 1998 and mainly responsible for the upward turn of the curve in Graph 6.2, can however considerably influence the general image.

Table 6.3: Number of persons killed in road accidents (harmonised*)

	1990	1995	1996	1997	1998	1999	2000
Belgium	1 976	1 449	1 356	1 364	1 500	1 397	1 470
Denmark	634	582	514	489	499	514	521
Germany	11 046	9 454	8 758	8 549	7 792	7 772	7 503
Greece	2 050	2 411	2 157	2 105	2 182	2 116	2 088
Spain	9 032	5 749	5 482	5 604	5 957	5 738	5 776
France	11 215	8 891	8 541	8 444	8 918	8 487	8 079
Ireland	478	437	453	472	458	413	415
Italy	7 137	7 020	6 676	6 713	6 314	6 633	6 410
Luxembourg	71	70	71	60	57	58	76
Netherlands	1 376	1 334	1 180	1 163	1 066	1 090	1 082
Austria	1 558	1 210	1 027	1 105	963	1 079	976
Portugal	3 017	2 711	2 730	2 521	2 425	1 940	1 849
Finland	649	441	404	438	400	431	396
Sweden	772	572	537	541	531	580	591
United Kingdom	5 402	3 765	3 740	3 743	3 581	3 564	3 580
EU-15	56 414	46 096	43 626	43 311	42 643	41 812	40 812
index 1990 = 100	100	82	77	77	76	74	72

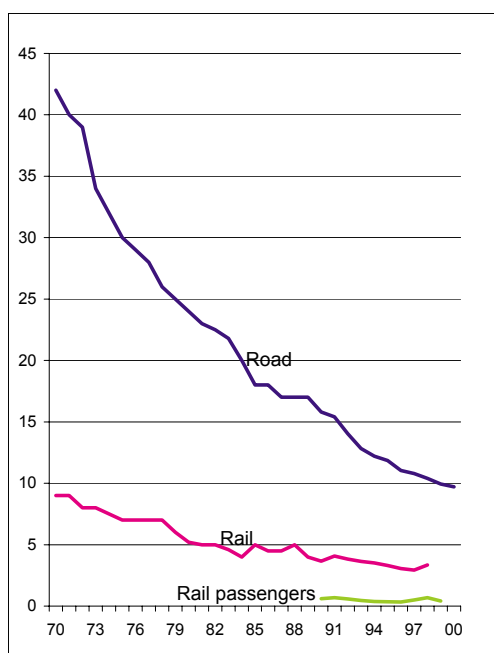
NB: Persons dying within 30 days following the accident. For countries that do not follow this definition (Greece: 3 days (until 1996) - Spain: 1 day (until 1992) ; France: 6 days ; Italy: 7 days ; Austria: 3 days (until 1991) and Portugal: 1 day), correction factors have been applied: Greece: 1.18, Spain: 1.3, France: 1.09 until 1993 and 1.057 from 1994 onwards, Italy: 1.078, Austria 1.12 and Portugal: 1.3.
Source: Eurostat.

Table 6.4: Number of persons killed in road accidents per million inhabitants

	1990	1995	1996	1997	1998	1999	2000
Belgium	198	143	134	134	147	137	143
Denmark	123	111	98	93	94	97	98
Germany	139	116	107	104	95	95	91
Greece	202	231	206	200	207	201	198
Spain	232	147	140	142	151	145	145
France	198	154	147	145	153	145	137
Ireland	136	121	125	128	123	109	109
Italy	126	123	116	117	110	115	111
Luxembourg	186	171	171	143	134	134	174
Netherlands	92	86	76	75	68	69	68
Austria	202	150	127	137	119	133	120
Portugal	305	273	275	253	243	192	181
Finland	130	86	79	85	78	83	77
Sweden	90	65	61	61	60	65	67
United Kingdom	94	64	64	63	60	60	60
EU-15	155	125	118	115	114	111	109
index 1990 = 100	100	80	76	75	74	72	70

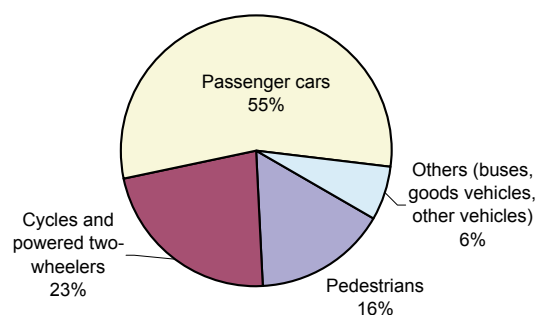
Source: Eurostat.

Graph 6.5: Number of killed persons in EU 15 (per 1000 million pkm)



Source: Eurostat, UIC.

Graph 6.7: EU-15: Fatalities in road accidents in 2000: share by type of user



Source: Eurostat.

Table 6.6: Deaths in road accidents (per 1 000 million pkm)

	1990	1995	1996	1997	1998	1999	2000
Belgium	20	13	12	12	13	12	12
Denmark	11	9	8	7	7	7	7
Germany	14	12	11	11	10	10	9
Greece	31	31	26	25	24	22	21
Spain	36	19	17	17	17	15	15
France	18	13	12	12	12	11	11
Ireland	22	15	15	14	13	11	11
Italy	12	10	9	9	8	9	8
Luxembourg	14	13	12	10	10	10	13
Netherlands	9	9	8	7	7	7	7
Austria	22	15	13	14	12	13	12
Portugal	59	37	35	31	28	21	19
Finland	11	8	7	7	7	7	6
Sweden	8	6	5	5	5	6	6
United Kingdom	8	6	6	6	5	5	5
EU-15	16	12	11	11	10	10	10

Table 6.8: Number of persons killed in accidents involving railways (per 1 000 million pkm)

	1990	1995	1996	1997	1998	1999	1999 absolute number of persons killed
Belgium	3.1	3.0	3.8	2.6	4.2	3.7	27
Denmark	1.2	2.1	1.9	1.8	1.7	:	:
Germany	4.1	3.7	3.3	3.2	4.5	3.1	230
Greece	17.2	31.3	24.0	22.8	30.3	18.3	29
Spain	1.8	1.4	1.3	2.1	0.7	1.0	20
France	2.9	2.3	2.3	1.9	2.2	1.6	106
Ireland	11.4	5.4	6.2	10.1	9.9	6.9	10
Italy	1.9	2.7	2.4	2.2	2.3	2.0	86
Luxembourg	9.6	10.5	10.6	10.2	3.3	-	-
Netherlands	3.9	3.5	2.6	2.4	2.4	:	:
Austria	6.2	7.1	4.9	2.8	4.4	5.6	45
Portugal	23.1	19.8	27.1	26.1	21.1	24.3	105
Finland	10.8	5.3	3.7	6.2	7.1	4.7	16
Sweden	2.8	1.4	2.5	1.6	3.5	2.6	20
United Kingdom	2.4	0.9	0.8	1.4	1.8	2.1	82
EU-15	3.7	3.3	3.1	2.9	3.3	:	:

Sources: Eurostat, UIC.

Table 6.9: Number of railway passengers killed in accidents involving railways (per 1 000 million pkm)

	1990	1995	1996	1997	1998	1999
Belgium	0.0	0.4	0.9	0.1	0.4	0.4
Denmark	0.2	0.0	0.0	0.0	0.0	0.4
Germany	0.8	0.5	0.4	0.4	1.9	0.4
Greece	0.0	1.9	0.0	1.1	0.0	0.6
Spain	0.2	0.0	0.0	1.2	0.1	0.0
France	0.5	0.4	0.2	0.4	0.2	0.2
Ireland	0.8	0.0	0.0	0.7	0.0	0.0
Italy	0.2	0.1	0.3	0.3	0.4	0.5
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	0.2	0.0	0.1	0.0	0.0	0.1
Austria	0.7	0.7	0.3	0.1	0.5	1.0
Portugal	3.9	2.5	2.2	3.0	1.7	1.8
Finland	0.0	0.3	0.9	0.3	2.9	0.3
Sweden	0.5	0.0	0.0	1.1	0.0	0.0
United Kingdom	1.1	0.3	0.5	0.8	0.5	1.0
EU-15	0.6	0.4	0.3	0.5	0.7	0.4

Source: Eurostat, UIC.

Fatalities in air transport accidents

Since 1993, Eurostat has been collecting and processing various aviation data at EU level. The collection of these data was on a voluntary base until 2002. Since 2003, an EU Regulation covers the reporting of aviation statistics, without however details on accidents.

Anyway, the air transport accident domain has to cope with definition problems: should accidents involving EU carriers been taken into account or rather accidents on EU-15 territory regardless of the nationality of the carrier? How should accidents that happen outside territorial waters be dealt with?

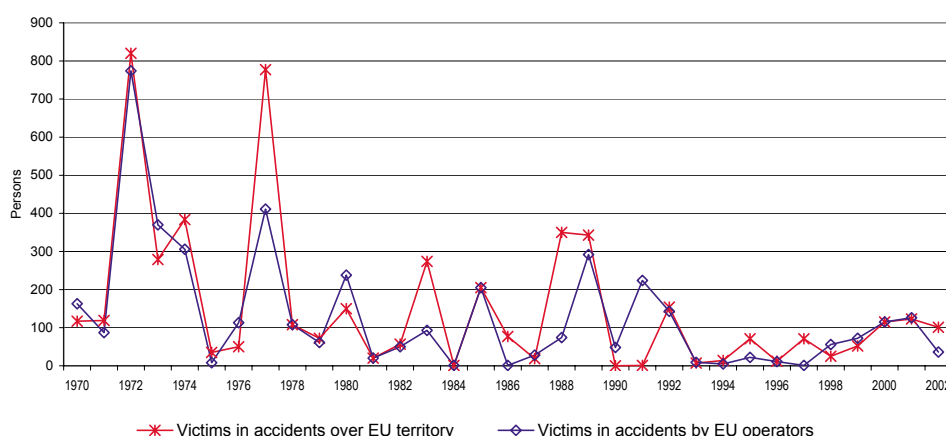
Graph 6.10 displays two curves for the period 1970 to 2002 (included): one curve expresses the number of fatal casualties in accidents on or over EU territory (accidents happening over international waters are excluded), the other curve represents the number of fatalities in accidents involving carriers registered in EU Member States. Please note that the figures include only passengers and crew members and exclude deaths on the ground.

Despite the very important increase in air traffic, both curves show a general decline over the last 30 years, although particularly strong fluctuations characterise the first decade observed. 1972 was a year marked by 15 accidents, 5 of which caused the death of more than 100 persons. Another particularly tragic year was 1977 when a single accident (collision between two large aircraft) claimed 583 lives. The fact that one aircraft was operated by a EU company and the other by a non-EU operator explains the strong difference between the two curves for that year. 1988 was marked by the Lockerbie disaster (259 fatalities — fatalities on the ground not included). These fatalities are included in the 'EU territory' curve but are excluded from the 'EU-operator' curve since the aircraft was operated by a North American company.

For the year 2000 and 2001, the number of fatalities for both curves would have been close to zero without the tragic accidents involving a Concorde in Paris (109 deaths, in 2000) and a Scandinavian aircraft in Milan (110 deaths, in 2001). The year 2002 was marked by an accident in South-Germany in July involving a Russian aircraft and a parcel-service aircraft (71 deaths, and largely explaining the difference in the two curves of Graph 6.10 for that year) as well as the crash of a Luxembourg-registered passenger aircraft upon approach to Luxembourg airport (in November, 20 deaths).

Comparisons with safety in road and rail transport are difficult. Reliable statistics on the passenger kilometres performed in air traffic are scarce. But even with reliable pkm figures, the image would be distorted since only few accidents happen en route. The vast majority of accidents happen either at take-off/initial climb or during final approach/landing. According to the independent and non-profit Flight Safety Foundation and based on a long-term study, only 4.7 % of the accidents occur during the cruise phase although this phase constitutes 57 % of the flight time (based on an average total flight time of 1.5 hours). Some 24 % of the accidents happen during take-off and initial climb (2 % of the flight time), 45 % during final approach and landing (4 % of the flight time). Long-haul flights are thus not particularly more dangerous than short-haul flights. The establishment of the 'fatalities per 1 000 million passenger kilometre'-ratio has therefore only very limited value. The same would apply for the establishment of the ratio 'deaths per flying hours'.

Graph 6.10 : Number of deaths in air accidents* 1970-2002



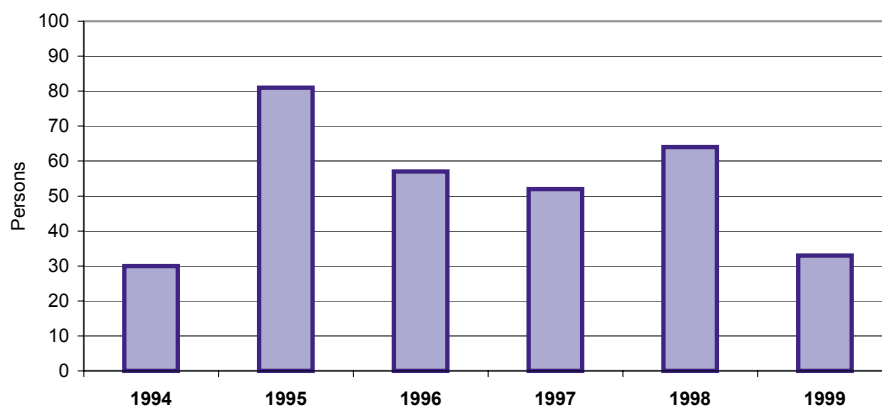
* Accidents during training and test flights, accidents involving aircrafts of armed forces and accidents in business flying excluded. In-flight accidents due to sabotage, terrorist attacks and war risks included.
Sources: Airclaims CASE2 database.

Deaths in maritime transport accidents

Reliable figures on the number of deaths occurring in maritime transport operations are not easy to obtain. With regards to the information displayed in Graph 6.11, only accidents involving vessels registered (flagged) in the various registers of the European Union (please refer to the note of Graph 6.11) have been taken into account, irrespective of the location of the accident. Persons who are considered as missing have been included. For the time range available (1994-1999), the absolute number of deaths fluctuates between 30 and 80 per year. The worst accidents that occurred in Europe in recent years was the sinking of the ferries «Herald of Free Enterprise» (6 March 1987, off the port of Zeebrugge, Belgium – 188 deaths) and the Estonia (on 28 September 1994, en route from Tallinn to Stockholm). Latter accident caused the death of 852 persons. Since the Estonia is not registered in one of the ship registers as specified under Graph 6.11, the victims of this disaster are not included in the 1994 column.

The number of deaths as shown in the graph are however most likely to be underestimated since an increasing number of EU ship operators tend, for economic reasons, to register maritime vessels in non-EU Registers (the so-called «flags of convenience»). The share of the fleet of a Member State sailing under a «flag of convenience» can be substantial (see in particular Table 3.8 in Chapter 3, *Means of transport* and related comments).

Graph 6.11: Number of persons killed in maritime accidents* 1994-1999



* Ships from the following registers have been taken into account: Austria, Belgium, Danish International Register, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Madeira, Netherlands, Portugal, Spain, Sweden, United Kingdom.
Source: International Underwriters Association (IUA).

Candidate Countries

Only Lithuania with an increase

Table 6.12 offers an overview of the number of deaths occurring in road transport for the period 1996-2001. On the background of a rapidly increasing passenger car fleet along with a likely higher passenger-kilometres performance in the Eastern European Candidate Countries, it appears surprising that most countries display a decline in the number of road deaths. Only Lithuania registered a 6% increase, whereas the absolute number of victims in Bulgaria remained nearly constant throughout the period considered.

Among all the Candidate Countries, Slovenia and Cyprus registered the most important drop in numbers with -29% and -23% respectively.

Table 6.12: Number of persons killed in road accidents

	1996	1997	1998	1999	2000	2001
	absolute number					
Bulgaria	1 014	915	1 003	1 047	1 012	1 011
Cyprus	128	115	111	113	111	98
Czech Republic	1 562	1 597	1 360	1 455	1 486	1 334
Estonia	213	280	284	232	204	199
Hungary	1 370	1 391	1 371	1 306	1 200	1 239
Latvia	550	525	627	604	588	517
Lithuania	667	725	829	748	641	706
Malta	19	18	17	4	15	16
Poland	6 359	7 310	7 080	6 730	6 294	5 534
Romania	2 845	2 863	2 778	2 505	2 499	2 461
Slovak Republic	640	828	860	671	647	625
Slovenia	389	357	309	334	313	278
Turkey	5 428	5 125	6 083	5 713	5 510	4 386
	per million inhabitants					
Bulgaria	121	110	121	128	124	128
Cyprus	173	155	148	150	147	129
Czech Republic	151	155	132	141	144	130
Estonia	145	192	196	165	149	146
Hungary	134	137	136	130	119	122
Latvia	221	213	256	251	248	220
Lithuania	180	196	224	202	178	203
Malta	51	48	45	11	38	41
Poland	165	189	183	174	163	143
Romania	126	127	123	111	111	110
Slovak Republic	119	154	160	124	120	116
Slovenia	195	180	156	168	157	140
Turkey	87	80	94	86	82	64
	per 1000 million pkm					
Bulgaria	:	:	:	:	:	:
Cyprus	:	:	:	:	:	:
Czech Republic	24	21	21	18	19	19
Estonia	60	102	:	:	:	:
Hungary	:	:	:	:	:	:
Latvia	255	273	:	:	:	:
Lithuania	161	188	231	:	:	:
Malta	:	:	:	:	:	:
Poland	203	187	221	208	202	198
Romania	:	111	218	150	158	:
Slovak Republic	36	52	61	51	63	61
Slovenia	:	:	:	:	:	:
Turkey	:	:	:	:	:	:

Source: Eurostat/ECMT/UNECE.

Careful interpretation

The number of road accident fatalities per million inhabitants globally follows the same trend.

All countries except Malta and Turkey (Turkey mainly due to a low motorisation rate) show values for 2001 that are sometimes considerably over the EU average (109 deaths per million inhabitants, in 2000). This is notably the case for Latvia and Lithuania, with values over 200 deaths per million inhabitants.

The fact that passenger road transport performance figures are only partially available does not allow for a judgement of the more interesting ratio 'road accident deaths per 1000 million pkm'. Initial data suggest that Polish roads appear to be particularly dangerous. The available data for the three Candidate Countries should however be considered with extreme care.

Rail: considerable differences

As for the EU Member States, the absolute number of deaths due to rail accidents seem to fluctuate to a certain extent. When considering the ratio on the basis of the pkm performance, it appears that considerable differences are registered between the individual Candidate Countries. Only Lithuania, Poland and the Slovak Republic appear to be close to the EU-average.

Table 6.13: Number of persons killed in accidents involving railways

	1995	1996	1997	1998	1999	2000
absolute number						
Bulgaria	:	:	:	:	:	:
Cyprus	-	-	-	-	-	-
Czech Republic	63	159	108	202	81	74
Estonia	34	23	22	23	16	20
Hungary	126	122	112	115	106	105
Latvia	:	:	:	53	33	32
Lithuania	:	:	:	:	-	1
Malta	-	-	-	-	-	-
Poland	83	72	73	78	64	50
Romania	:	:	:	:	:	:
Slovak Republic	3	10	18	12	8	11
Slovenia	32	25	18	21	28	13
Turkey	175	198	245	227	233	185
per 1000 million pkm						
Bulgaria	:	:	:	:	:	:
Cyprus	-	-	-	-	-	-
Czech Republic	7.9	19.6	14.0	28.9	11.7	10.2
Estonia	81.0	74.4	84.0	97.5	67.2	76.0
Hungary	14.9	14.2	12.9	12.9	11.1	10.8
Latvia	:	:	:	50.0	33.5	44.7
Lithuania	:	:	:	:	-	1.6
Malta	-	-	-	-	-	-
Poland	3.1	2.7	2.8	3.0	2.4	2.1
Romania	:	:	:	:	:	:
Slovak Republic	0.7	2.7	5.8	3.9	2.7	3.8
Slovenia	53.3	40.8	29.2	32.6	44.7	18.5
Turkey	30.2	38.1	42.2	36.6	37.9	31.7

Source: Eurostat/ECMT/UNECE.

EFTA Countries

With regards to road safety, Norway can be counted among the 'better' countries in Europe. Very similar to its Scandinavian EU-Member States neighbours, data suggest a road safety well over the EU average.

Switzerland has seen both its absolute number and its number per million inhabitants drop by around 15% between 1995 and 2000. Although incomplete data do not allow a full comparison, it seems that in road safety, Switzerland 'performs' better than the EU average.

Data for small or low populated countries like Liechtenstein or Iceland obviously tend to present certain fluctuations due to the low absolute figures. Best example is Liechtenstein, where the number of victims passed from 3 to 6 and a year later to zero (1996-1998 period). Accordingly, the figures expressed 'per million inhabitants' offer the same extreme fluctuations.

Table 6.14: Number of persons killed in road accidents

	1995	1996	1997	1998	1999	2000
	absolute number					
Iceland	24	10	15	27	21	32
Liechtenstein	2	3	6	-	-	3
Norway	305	255	303	352	304	341
Switzerland	692	616	587	597	583	592
	per million inhabitants					
Iceland	90	37	55	99	76	112
Liechtenstein	65	97	192	0	0	92
Norway	70	58	69	79	68	76
Switzerland	98	87	83	84	82	82
	per 1000 million pkm					
Iceland	:	:	4	7	5	8
Liechtenstein	:	:	:	:	:	:
Norway	6	5	6	7	6	6
Switzerland	:	:	:	:	:	:

Source: Eurostat/ECMT/UNECE.

7. Environment and energy

7.1. General development

It has been recognised for many years that the transport sector is one of the main sources of pressure on the environment, particularly in relation to air pollution and noise. Numerous measures have been taken in the past; it is true that notably road vehicles and aircraft today are substantially more energy-efficient and pollute less than they did 10 or 20 years ago. In most countries however, environmental measures failed to keep pace with growing transport volumes.

Whereas CO₂ emissions from transport continuous to increase, other sectors show a welcome decline

The transport sector (excluding maritime transport) accounted for 32% of the total energy consumption in the EU in 2001. With regards to CO₂ emissions generated from the combustion of fossil fuels (and calculated on the basis of Eurostat energy data using default conversion factors), it is responsible for a volume of 910 million tonnes for that same year. This represents 44% of the total CO₂ emissions from fossil fuels. Compared to 1991, this represents an increase of over 22%, even though the overall CO₂ emissions from fossil fuels (i.e. all sectors)

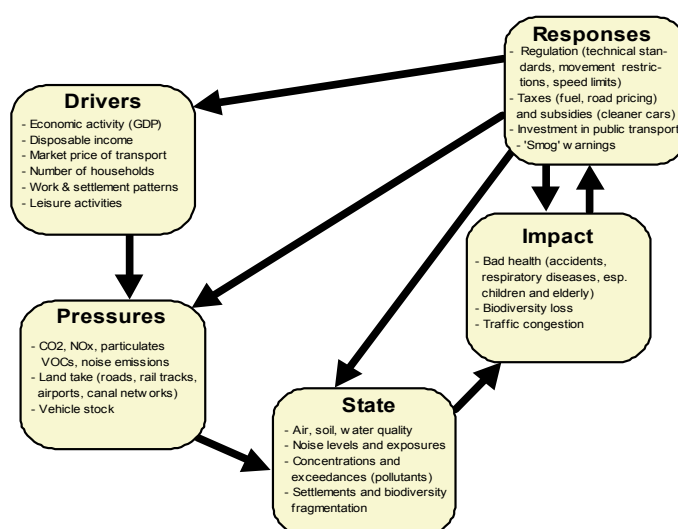
increased by only 4%. In fact, the other economic sectors have noticeably decreased their emissions over the last decade: the industry sector by 8% and the sector of households, services, etc. by 6% (1991-2001).

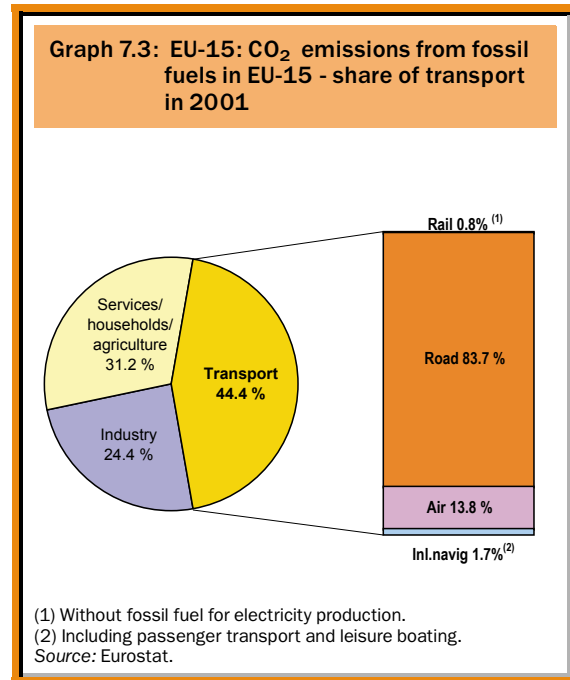
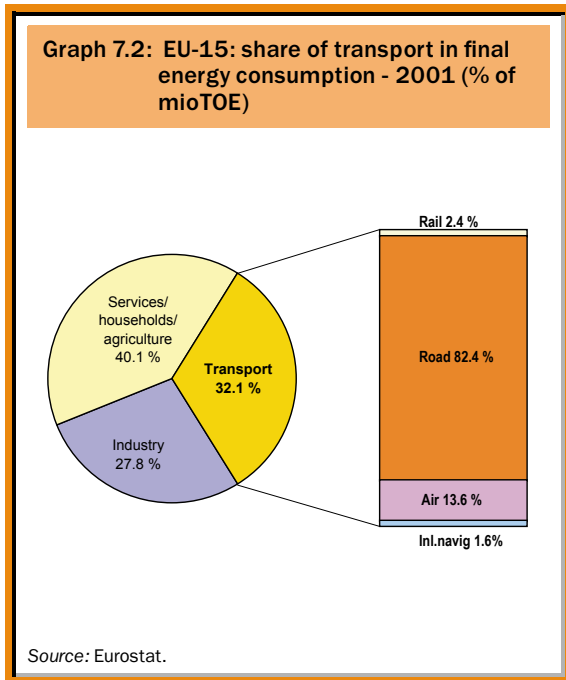
Improving the sustainability of the transport sector clearly requires a more comprehensive and integrated transport and environment policy approach, combining legislation and economic instruments in a transparent way across all transport modes. An integration implies a change in policy-making focus from 'end-of-pipe' actions to a greater focus on preventative actions.

Preventative and integrated

More than ever, there is a need for better integration of environmental concerns into transport policies and decision-making. This integration has been given a high political priority following the Treaty of Amsterdam. As part of this process, a transport and environment reporting mechanism (TERM) for the EU was initiated by the Commission and the European Environmental Agency (EEA), generating an indicator-based report. The report includes a set of indicators most relevant to EU policy needs and decision-

Graph 7.1: The DPSIR framework for reporting in the environmental impact of transport





making. It should allow for the evaluation of whether transport develops in line with the objectives of sustainable mobility.

Graph 7.1 outlines the DPSIR approach (driving forces, pressures, state, impact and responses), a generic tool to support understanding of the complex relationships across the whole range of environmental issues.

It is not the aim of this introductory chapter to go into detail of the TERM project. However Eurostat would like to outline the integrated approach of TERM, where most facets of the transport sector are covered. The TERM indicator list not only covers transport demand and intensity, but also aspects like landuse, access to basic transport services and expenditure on personal mobility, topics not covered by the present publication.

Consumption and emissions closely linked

With regards to fossil fuels, less consumption in general means less CO₂ emissions. Graph 7.2 shows the transport share in final energy consumption. Within the transport sector, road transport has a share of 82 %, followed by air transport with 14%. Graph 7.3 outlines a broadly similar picture with regard to the shares of the various transport modes in CO₂ emissions from fossil fuels.

Scrappage schemes and low sulphur fuels

Although CO₂ emissions are often in the focus of public discussion (carbon dioxides are not harmful as such but are generally made responsible for

the «greenhouse effect»), it should be noted that substantial efforts are made to reduce other pollutants as well.

In road traffic, lead emissions have been reduced to zero following the introduction of unleaded petrol. Catalyst technology has brought a constant reduction in the quantities of nitrogen oxides (NO_x), carbonmonoxides (CO) and volatile organic compounds (HC) emitted per vehicle. Improved motor vehicle engine technology (direct petrol injection, particulate filters on diesel-engined cars), the gradual introduction of fuels with a considerably reduced content of sulphur (less than 50 parts per million – compulsory as from 2005 onwards) and the coming into force of new EU emission standards had and will continue to have positive effects.

The situation in certain Member States is now such that a small percentage of old vehicles emit a proportionally large amount of noxious substances. Various national scrappage schemes have contributed in getting these old vehicles off the road.

Electricity for traction in rail transport is constantly increasing in most Member States (see Chapter 3 — *Means of transport*). It should however be noted that emissions corresponding to electricity used in transport appear under electricity production and not transport.

Only few small inland waterway vessels left

Although transport by inland waterways is of minor importance compared to the other modes, it should be mentioned that the fleet of vessels has undergone substantial changes over the last 20 years: scrappage schemes in various countries have eliminated smaller and less efficient vessels from the fleet. From the environmental point of view, inland navigation is of considerable interest and still has potential for further development at EU level. Quite remarkably, the transport performance over inland waterways has not decreased despite a considerable reduction of the fleet.

Most aircraft related emissions at critical altitude

Liberalisation of air traffic has certainly brought further positive effects with regard to the 'democratisation' of air travel, but it is increasing rapidly, at rates outperforming the impact of technological improvements reducing engine emissions. In absolute terms, gaseous aircraft emissions are low compared to other man-made emissions, but within the transport sector, its share is rapidly increasing. The main difference with other transport modes is the fact that a substantial part of aircraft emissions occur in the

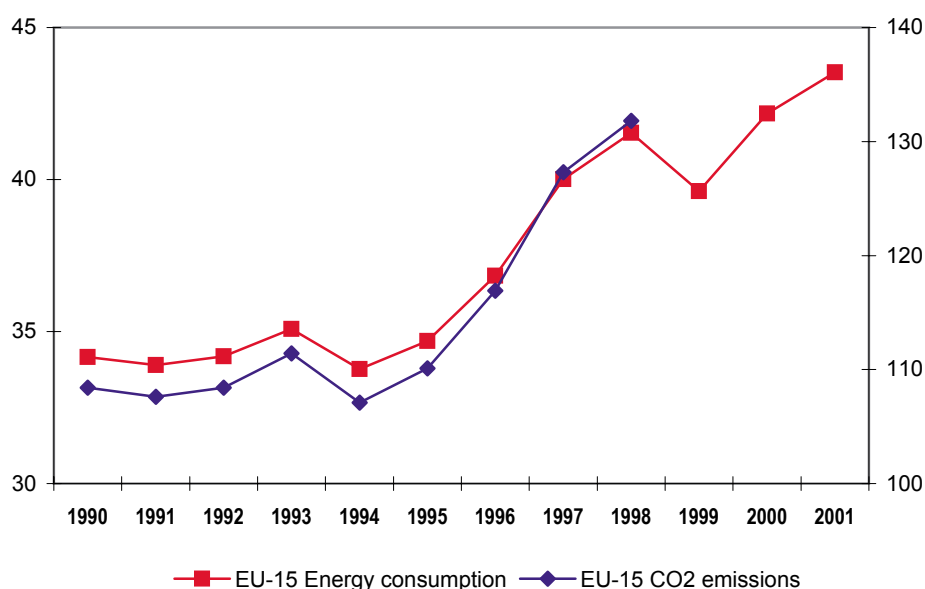
critical altitude region below and above the tropopause, between 9 and 14 km altitude. This could significantly affect atmospheric ozone and cloud coverage. Substantial research is needed to sufficiently understand how aircraft perturb the atmosphere. Unless new, less-polluting engines and significantly more fuel-efficient aircraft technologies are introduced, the relative contribution of aviation to environmental changes will become more significant.

Relatively high risk due to dense maritime traffic

The overall environmental impact of maritime transport is low compared to the other transport modes. However, major accidents of sea-going vessels can result in large oil spills or have other important ecological impacts. This is particularly true in the waters around the European Union featuring a relatively dense maritime traffic (see separate box).

It remains however difficult to attribute both energy consumption and emissions to individual countries. As for the other transport modes, fossil fuel consumption and CO₂ emissions are closely linked. Graph 7.4 outlines this link at EU-15 level.

Graph 7.4: Evolution of energy consumption and CO₂ emissions of maritime transport (EU-15)



Source: Eurostat.

Maritime safety

Despite the existence of a well developed framework of international rules for safety at sea and for the protection of the marine environment, laid down in conventions developed within the International Maritime Organization (IMO) and the International Labour Organization (ILO), certain operators continue to put the ship's crew and the environment at risk while taking benefit from an unfair competition. There is a steady drift of the EU fleet towards 'flags of convenience', countries which are far more attractive to shipowners than Europe in terms of taxation, social legislation and safety or environmental standards (see also chapter 3 *Means of transport*).

Due to loopholes in the conventions, an important degree of discretion left to flag States and several possibilities to derogate, the EU became more and more involved in maritime safety.

Major oil tanker accidents in European waters since 1967

Year	Name of vessel	Location	Oil spill
1967	Torrey Canyon	Scilly Isles, United Kingdom	119 000 t
1975	Jakob Maersk	Oporto, Portugal	88 000 t
1976	Urquiola	La Coruña, Spain	100 000 t
1978	Amoco Cadiz	off Brittany's coast, France	223 000 t
1991	Haven	Genoa, Italy	144 000 t
1992	Aegean Sea	La Coruña, Spain	100 000 t
1993	Braer	Shetland Islands, United Kingdom	119 000 t
1996	Sea Empress	Milford Haven, United Kingdom	72 000 t
1999	Erika	off Brittany's coast, France	14 000 t
2002	Prestige	off Galicia's coast, Spain	77 000 t

Although some legislative decisions were taken in the period 1978-1992, the real start of the maritime safety policy occurred in 1993. The breakthrough was caused by the the accidents with the oil tankers « Aegean Sea » (December 1992) and « Braer » (January 1993) and the abandoning of the unanimity rule for the maritime decision making process (1.1.1993).

Several legislative acts were adopted in the following years, representing the core of the EU's maritime safety policy. However, new accidents (especially the « Estonia » disaster in September 1994) initiated additional actions, focussing on specific shortcomings (safety standards for international ferries and passenger ships operating on domestic routes).

The « Erika » and « Prestige » accidents caused enormous damage to the environment and had a disastrous effect on fishing and shellfish farming. Only months after the « Erika » accident, the EU tabled a package of measures : the so-called « Erika I package ». It strengthens the existing Directive on port State control (more vessel controls, ships considered 'substandard' on several occasions can be blacklisted and banned from EU ports), imposes a stricter monitoring of classification societies (who certify ships on behalf of flag States) and establishes a timetable for the phasing out of single hull oil tankers (the last single hull tankers will be banned from EU waters in 2015). However, the Community Regulation can only ban such ships from entering Member States' ports, but cannot prevent them from navigating off Europe's shores under current international law.

The « Erika I package » entered into force in July 2003. Certain Member States have failed to transpose this maritime safety legislation in national laws, resulting in infringement procedures against those countries by the European Commission.

The « Erika II package » comprises three additional measures: the creation of a European Maritime Safety Agency (EMSA) enforcing the new safety requirements and harmonising their inspection and control procedures, the establishment of an information system to improve the monitoring of traffic (including the fitting of 'black boxes' recording voyage data) and the creation of a mechanism to improve compensation for victims of oil spills.

The first two measures were adopted by the European Parliament and the Council in June 2002.

Candidate Countries

With the unprecedented enlargement of the European Union, Europe might need to re-think its international role if it is to succeed in developing a sustainable transport system and tackling the problems of congestion and pollution.

Provided the new Member States effectively apply the Community acquis, the transport domain should experience substantial improvements in a variety of domains. In road haulage, environmental benefits should result from the application of emission (and safety) standards. Rail transport traditionally played a substantial role in central and eastern European countries and the enlargement is an opportunity that should be seized to restore the modal balance of transport. Efforts should be deployed to convince the countries in question to maintain the railways' share of the freight market to a high level.

With regard to the regulatory framework in the aviation and maritime domain, the EU depends on international organisations such as the International Civil Aviation Organisation (ICAO) and the International Maritime Organisation (IMO). The international rules have often been established to facilitate trade and commerce but they often fail to take sufficient account of key environmental protection concerns. The extension of the Community's seaboard upon enlargement will allow it to organise the monitoring of shipping more effectively and to minimise the risk of accidents, particularly those caused by ships carrying dangerous or polluting goods (see box *Maritime safety*). This should be seen in the light of the fact that the EU fleet is set to increase substantially, given that the flags of Cyprus and Malta alone represent a tonnage almost equivalent to that of the current Community fleet.

7.2. Energy consumption

Since the early 1990, transport overtook industry – Since 1960 the share of transport (road, rail, inland navigation and aviation) in total final energy consumption has been steadily increasing. At the start of the 1990s, it overtook the share of industry and reached at 32 % in 2001 (1960: 17 %). As can be seen in Table 7.5, road transport alone accounts for over 250 million ‘tonnes of oil equivalent’ at EU level, corresponding to 26.5 % of EU total final energy consumption.

Within the transport sector (excluding international maritime transport and pipelines), road transport's share was more than 82 % in 2001 (1960: 57 %). Rail transport stood at 2.4 % (1960: 31 %) and transport via inland waterways at 1.6 % (1960: 5 %). Air transport accounted for the remaining 13.6 %.

Limited prospects for large-scale substitution

Road transport is by far the largest consumer of petroleum products and although future developments may lead to a greater use of alternative fuels, there is presently little possibility for substitution. Increased car ownership and mobility, the trend towards larger engines as well as a growing share of goods transported by road offset the general trend to lower consumption through more fuel-efficient vehicles.

LPG important in Italy and the Netherlands

Table 7.6 shows the consumption of the various fuels by country and by transport mode. The table excludes lubricants. For road, the fuels included are liquefied petroleum gas (LPG), leaded and unleaded petrol as well as diesel fuel. LPG plays a very limited role in most Member States. Exceptions are the Netherlands and Italy, where LPG contributed 7.4 % and 9 % respectively in

1999. Given the small level of consumption at EU level, compressed natural gas (CNG) has been disregarded. Coal used for rail traction has not been taken into account because of its very small share. Electricity consumption for rail traction, which includes urban transport systems, has been converted to ‘tonnes of oil equivalent’ (toe) to enable comparison. Attention should be given to the consumption of the inland waterways transport mode. The figures shown include consumption by small vessels (including leisure boats) performing coastal shipping and not using fuel from international maritime bunkers. This explains data for countries without a significant inland waterway network.

Decreases in road transport fuel consumption for Denmark and Germany in 2001

All countries show a high road transport share. At EU-15 level, road transport consumption in 2001 increased by 1.3 % compared to 2000 (all products, see Table 7.5). The highest increase was recorded for Ireland (+10.1%) and the Netherlands (+8.9%). A decrease was registered for Denmark (-5.1%) and Germany (-2.1%).

Due to the growing share of electrified lines, the consumption of electricity for rail traction is increasing, displacing diesel fuel usage. The modal share for inland navigation is relatively high in Greece (9%) and Spain (4%) and can partly be explained by the significance of tourism in these Mediterranean countries. At EU-15 level, aviation recorded the highest increase in fuel consumption between 1985 and 2001: + 102 %, even after a decrease between 2000 and 2001, the first time this has been recorded. In aviation, the figures show the amount of aviation fuel supplied in each

Table 7.5: Final energy consumption (all products) of the transport sector - EU-15 (million toe)

	1985	1990	1995	1996	1997	1998	1999	2000	2001	Share in 2001 (%)
Final energy consumption	826.5	861.2	897.8	935.9	928	945.1	951.6	951.1	970.3	100
	<i>of which:</i>									
Industry	267.9	265.9	259.1	258.7	261.8	261.2	262.6	270.8	269.5	27.8
Services, households	356.0	342.3	363.6	393.9	377.6	384.0	381.3	369.7	388.9	40.1
TRANSPORT	202.7	253	275.1	283.3	288.6	299.9	07.7	310.5	311.9	32.1
	<i>of which:</i>									
Rail	7.0	7.0	7.4	7.6	7.6	7.7	7.5	7.7	7.5	2.4
Road	169.5	211.9	228.6	234.6	238.4	246.3	252.0	253.6	257.0	82.4
Air	21.1	27.7	32.5	34.2	36.0	39.5	42.1	44.0	42.5	13.6
Inland navigation	5.1	6.4	6.7	6.9	6.5	6.5	6.1	5.3	4.9	1.6

Source: Eurostat.

Table 7.6: Energy consumption of main fuels by transport mode (1 000 toe)

	1985	1990	1995	1996	1997	1998	1999	2000	2001	change 1985-2001 (%)	share in consump. 2001 (%)	
Belgium	road	5 119	6 442	7 084	7 211	7 285	7 504	7 596	7 819	7 981	56	85
	rail - diesel	113	70	77	74	61	63	64	60	56	-51	1
	rail - electric	102	107	125	109	108	117	120	124	126	23	1
	inl.navigation	242	129	247	431	399	299	263	136	127	-48	1
	aviation	561	955	947	1 072	1 342	1 591	1 554	1 524	1 154	106	12
Denmark	road	2 801	3 063	3 471	3 528	3 603	3 666	3 711	3 680	3 492	25	77
	rail - diesel	115	95	97	96	94	79	74	73	68	-41	1
	rail - electric	12	18	21	22	23	28	29	30	30	141	1
	inl.navigation	131	150	181	186	161	129	114	115	112	-14	2
	aviation	574	648	678	715	730	771	809	822	846	47	19
Germany	road	40 666	50 418	54 239	53 829	54 815	55 850	57 643	56 390	55 231	36	86
	rail - diesel	1 171	927	727	732	677	624	586	571	552	-53	1
	rail - electric	1 131	1 175	1 392	1 423	1 450	1 383	1 362	1 368	1 368	21	2
	inl.navigation	724	656	554	509	402	369	301	279	269	-63	0
	aviation	4 161	5 627	5 988	6 120	6 423	6 633	7 012	7 362	7 021	69	11
Greece	road	3 057	3 903	4 584	4 805	4 918	5 164	5 256	5 320	5 444	78	74
	rail - diesel	53	64	43	45	42	42	40	40	40	-23	1
	rail - electric	3	11	13	14	14	15	17	20	18	589	0
	inl.navigation	374	566	544	465	563	870	857	491	669	79	9
	aviation	1 187	1 273	1 246	1 230	1 187	1 201	1 284	1 325	1 191	0	16
Spain	road	11 811	17 676	20 466	21 713	21 946	24 035	25 307	26 126	27 409	132	80
	rail - diesel	182	212	288	354	404	455	485	489	521	187	2
	rail - electric	242	315	339	298	310	322	307	358	392	62	1
	inl.navigation	850	1 655	1 871	1 999	1 701	1 673	1 584	1 378	1 372	61	4
	aviation	1 968	2 467	3 105	3 386	3 649	3 974	4 208	4 497	4 538	131	13
France	road	29 387	36 171	37 456	39 083	39 895	41 280	41 166	42 739	43 133	47	83
	rail - diesel	491	387	386	339	418	455	373	369	243	-50	0
	rail - electric	656	764	834	918	934	955	968	1 004	1 005	53	2
	inl.navigation	305	718	733	735	739	882	750	775	757	148	1
	aviation	2 687	3 870	4 716	5 023	5 154	6 073	6 476	6 712	6 643	147	13
Ireland	road	1 430	1 546	1 730	2 171	2 365	2 706	2 991	3 155	3 474	143	81
	rail - diesel	43	46	49	77	87	102	115	124	39	-9	1
	rail - electric	1	1	2	2	2	2	2	2	2	87	0
	inl.navigation	5	7	28	32	34	36	40	38	20	298	0
	aviation	207	365	376	416	434	449	529	575	737	255	17
Italy	road	24 990	30 392	34 007	34 140	34 710	36 745	36 911	36 808	37 490	50	89
	rail - diesel	192	198	194	174	194	192	140	138	120	-37	0
	rail - electric	418	540	625	658	664	676	678	695	703	68	2
	inl.navigation	381	389	448	444	448	213	225	202	256	-33	1
	aviation	1 770	1 884	2 424	2 624	2 720	3 173	3 564	3 497	3 405	92	8
Luxembourg	road	512	863	1 109	1 140	1 204	1 258	1 353	1 541	1 628	218	82
	rail - diesel	9	8	2	2	5	5	8	7	3	-67	0
	rail - electric	4	5	7	9	7	7	8	8	9	124	0
	inl.navigation	0	0	0	0	0	0	0	0	0	-	0
	aviation	74	131	189	205	251	282	332	320	346	368	17
Netherlands	road	6 771	8 038	8 949	9 522	9 631	9 515	9 535	9 629	10 489	55	74
	rail - diesel	40	37	35	31	32	30	30	35	41	2	0
	rail - electric	95	109	127	135	135	140	141	140	136	43	1
	inl.navigation	697	556	697	657	687	657	667	667	313	-55	2
	aviation	1 239	1 614	2 595	2 772	3 003	3 266	3 393	3 348	3 254	163	23
Austria	road	4 017	4 322	4 770	5 270	4 973	5 219	5 624	5 601	5 981	49	86
	rail - diesel	71	67	77	69	71	41	42	47	47	-33	1
	rail - electric	199	300	247	270	274	278	271	280	310	56	4
	inl.navigation	0	7	6	6	6	6	7	7	8	-	0
	aviation	220	313	461	510	532	553	542	586	570	159	8
Portugal	road	2 059	3 026	4 104	4 363	4 535	4 929	5 179	5 592	5 663	175	87
	rail - diesel	58	56	55	50	54	47	51	57	42	-26	1
	rail - electric	23	27	26	28	29	31	31	31	31	32	0
	inl.navigation	53	43	46	46	44	46	38	43	50	-6	1
	aviation	466	576	622	626	604	650	744	793	758	63	12
Finland	road	2 896	3 631	3 505	3 416	3 602	3 635	3 699	3 671	3 746	29	84
	rail - diesel	72	63	62	54	55	54	52	47	44	-38	1
	rail - electric	31	37	43	40	43	44	45	46	49	55	1
	inl.navigation	91	71	85	81	78	81	93	118	135	48	3
	aviation	256	463	411	440	463	483	511	508	508	99	11
Sweden	road	5 371	6 103	6 432	6 385	6 424	6 510	6 647	6 731	7 181	34	84
	rail - diesel	83	39	39	35	35	16	8	24	24	-71	0
	rail - electric	225	213	234	264	254	240	259	275	268	19	3
	inl.navigation	198	143	103	78	99	129	138	154	154	-22	2
	aviation	555	764	856	848	874	883	944	934	950	71	11
United Kingdom	road	28 621	36 312	36 667	38 063	38 518	38 264	39 424	38 772	38 659	35	76
	rail - diesel	750	621	609	585	480	489	469	446	422	-44	1
	rail - electric	254	454	636	638	667	720	736	747	760	200	1
	inl.navigation	998	1 269	1 117	1 204	1 168	1 092	975	920	653	-35	1
	aviation	5 173	6 794	7 838	8 245	8 612	9 479	10 218	11 182	10 605	105	21
EU-15	road	169 507	211 907	228 573	234 639	238 424	246 280	252 042	253 674	257 001	52	82
	rail - diesel	3 443	2 890	2 740	2 721	2 709	2 695	2 537	2 528	2 264	-34	1
	rail - electric	3 396	4 076	4 669	4 827	4 913	4 960	4 974	5 128	5 206	53	2
	inl.navigation	5 051	6 359	6 661	6 874	6 531	6 482	6 052	5 324	4 895	-3	2
	aviation	21 098	27 745	32 452	34 233	35 979	39 462	42 120	43 986	42 527	102	14
EU-15 index (1985 = 100)	road	100	125	135	138	141	145	149	150	152		
	rail - diesel	100	84	80	79	79	78	74	73	66		
	rail - electric	100	120	137	142	145	146	146	151	153		
	inl.navigation	100	126	132	136	129	128	120	105	97		
	aviation	100	132	154	162	171	187	200	208	202		

NB: Road fuels include LPG, motor spirits and diesel.

Rail - electric: conversion factor used : 1 GWh = 86 toe

Inland waterways: diesel oil; includes small crafts and coastal ships, using no fuel from international maritime bunkers.

Germany: series affected by German re-unification

Provisional data in bold

Source: Eurostat.

country. However, by the very nature of the industry, the fuel may in fact be used in or over many other countries.

Persistent price differences often govern choice of car engine

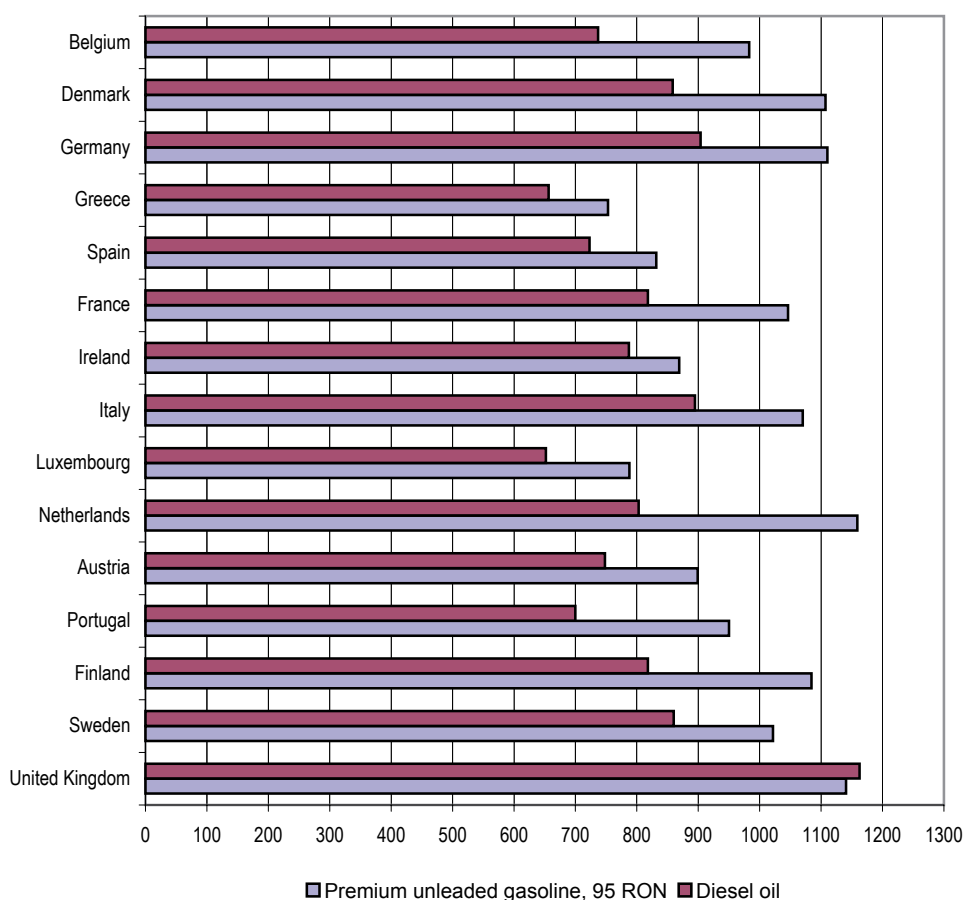
The price of road transport fuels influence consumers choice, both in terms of the quantities and the type of fuel purchased. The basic fuel price is set by oil production and the world market but excise duties and VAT rates are set by individual countries. Persistent substantial price differences can influence decisions on the type of vehicle purchased, leading to changes in the vehicle stock and fuel mix over time. Table 7.7 indicates the share in fuels delivered in 1998 and 2003 and gives an insight into how this fuel mix differs between the countries. In most countries, there is a gradual shift towards a higher share of

Table 7.7: Share of fuel in sales * (%)

	1998 (Second quarter)		2003 (Second quarter)	
	Diesel	Petrol (leaded & unleaded)	Diesel	Petrol
EU-15	49.8	50.2	58.8	41.2
Belgium	65.9	34.1	72.9	27.1
Denmark	49.5	50.5	49.5	50.5
Germany	41.5	58.5	51.3	48.7
Greece	45.5	54.5	41.7	58.3
Spain	57.3	42.7	68.0	32.0
France	63.0	37.0	72.6	27.4
Ireland	42.6	57.4	54.3	45.7
Italy	48.0	52.0	61.3	38.7
Luxembourg	56.3	43.7	70.0	30.0
Netherlands	56.0	44.0	60.3	39.7
Austria	62.7	37.3	71.2	28.8
Portugal	56.7	43.3	67.5	32.5
Finland	47.2	52.8	49.8	50.4
Sweden	34.3	65.7	23.5	76.5
United Kingdom	40.3	59.7	47.8	52.2

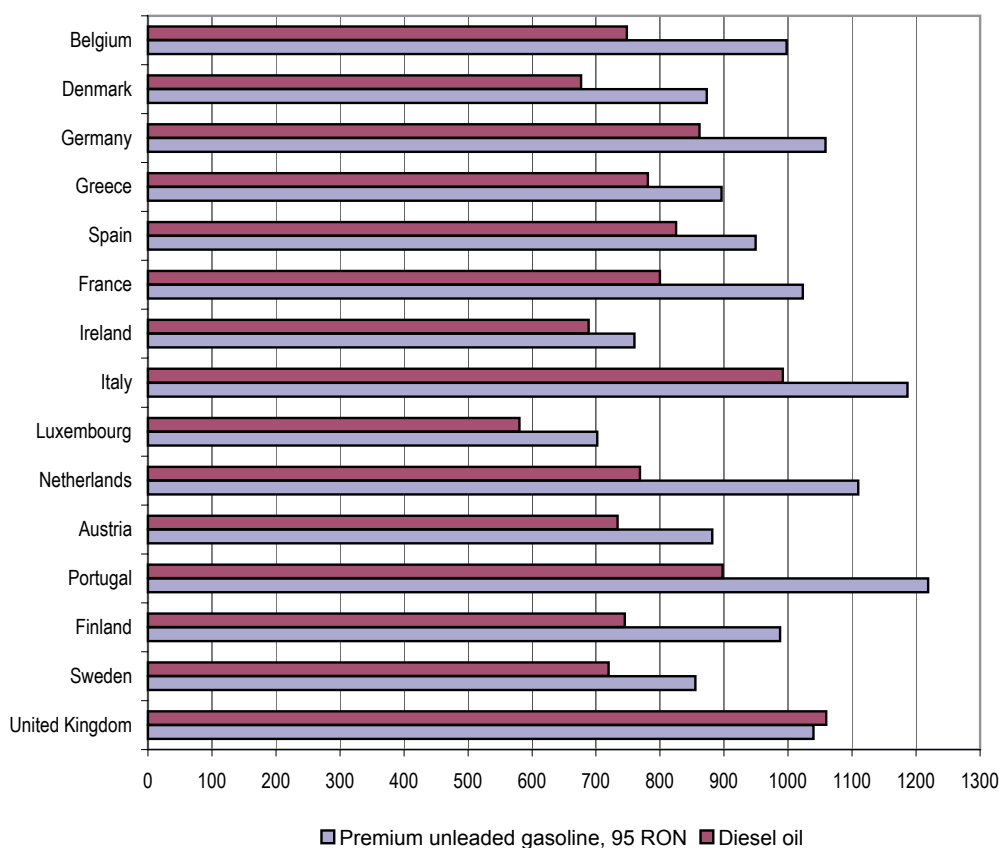
* Internal market deliveries.

Graph 7.8: Sales price (all taxes included) of unleaded petrol and diesel fuel - First half of 2003 (Euro per 1 000 litres)



Source: Eurostat.

Graph 7.9: Sales price (all taxes included) of unleaded petrol and diesel fuel - First half of 2003 (Purchasing power standard per 1 000 litres, provisional)



Source: Eurostat.

diesel. This shift is particularly noticeable for Spain, Italy, Ireland and Luxembourg. In 2003, the share of diesel in the total in Belgium, France, Luxembourg and Austria, was 70% or more. Only Greece and Sweden registered a drop in diesel's share compared to 1998. For Sweden, the drop was substantial (-11%). At EU level, 59% of the inland deliveries consist of diesel oil (2003). In 10 out of 15 Member States, diesel accounted for more than half of total fuel sales. It should be noted that the information in Table 7.7 includes fuel used by goods transport, which is almost entirely diesel powered.

UK: diesel more expensive than petrol

Graph 7.8 outlines the price (first half of 2003) of unleaded petrol and diesel fuel in the individual Member States including all taxes. For petrol, the highest prices are recorded in the Netherlands, while the lowest are paid in Greece. However, for

diesel, the highest prices are recorded in the United Kingdom while the lowest are paid in Luxembourg. The most substantial price differences between unleaded petrol and diesel fuel exist in the Netherlands and Finland. The lowest differences can be found in Ireland, Greece and Spain.

The only country where petrol is cheaper than diesel is the United Kingdom. If one looks at the sales price of fuels (including all taxes) expressed in purchase power standards (Graph 7.9 — indicating the price of fuels relative to other products) it appears that in Luxembourg, prices are even lower than those expressed in euros, whereas in Portugal, Greece and Spain, they were far higher. Unleaded petrol in Portugal has the highest price in purchasing power terms, yet relatively low in euro terms. The same applies to diesel fuel in the United Kingdom.

Energy consumption in maritime transport

To an even larger extent than the consumption of fuel in aviation, the attribution of fuel consumption to a country featuring the maritime transport sector is somewhat problematic. A large vessel might for instance bunker fuel in the port of Antwerp, but then travel quickly out of Belgian territorial waters. When looking at energy balances, it appears that unlike other transport modes (including aviation), «marine bunkers» do not constitute an element of «final consumption», but should rather be considered as an «export».

These remarks should be taken into account when looking at Table 7.10. The figures express, in million toe, the quantities delivered from the marine bunkers of the individual countries. The energy consumed in the maritime transport consists entirely of hydrocarbons. The main types of fuels used are «residual fuel oil» and «gas/diesel oil». It appears that at EU-15 level, more than 43 million toe have been delivered in 2001, a 56% increase compared to 1985. The highest relative increase was registered in Ireland, Greece, Denmark, and Spain. Considerable fluctuations can be noticed for many Member States throughout the period shown. In overall terms, the Netherlands alone - with Rotterdam as the world's largest port - accounts for nearly 34 % of the EU deliveries in 2001 (14.6 million toe). Spain and Belgium follow with 6.6 million toe and 5.2 million toe respectively.

Table 7.10: Energy consumption in maritime transport: marine bunkers (in million toe)

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Change 1985-2001 (%)
Belgium	2.31	4.09	4.19	4.15	4.27	4.10	3.90	4.50	5.06	5.40	4.36	5.34	5.23	127
Denmark	0.41	0.95	0.86	0.90	1.33	1.50	1.57	1.49	1.37	1.38	1.29	1.32	1.10	169
Germany	3.44	2.47	2.09	1.76	2.20	2.04	2.05	2.03	2.15	2.03	2.07	2.18	2.21	-36
Greece	1.10	2.53	2.32	2.67	3.10	3.29	3.54	3.11	3.12	3.47	3.09	3.56	3.46	213
Spain	2.63	3.81	3.83	3.89	3.38	3.06	3.15	4.60	5.68	5.97	5.82	5.93	6.63	152
France	2.38	2.52	2.62	2.53	2.38	2.12	2.48	2.68	2.92	2.85	2.88	2.98	2.68	13
Ireland	0.03	0.02	0.03	0.02	0.05	0.04	0.12	0.16	0.15	0.16	0.17	0.15	0.16	444
Italy	3.40	2.65	2.52	2.43	2.42	2.34	2.42	2.29	2.38	2.63	2.42	2.71	2.81	-17
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	8.67	10.82	11.08	11.18	11.58	11.07	11.21	11.41	12.09	12.19	12.60	13.29	14.59	68
Austria	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	0.47	0.60	0.61	0.60	0.51	0.48	0.48	0.50	0.49	0.38	0.58	0.66	0.47	0
Finland	0.46	0.56	0.53	0.67	0.53	0.41	0.33	0.37	0.40	0.51	0.55	0.66	0.57	24
Sweden	0.55	0.66	0.78	0.89	0.89	1.05	1.04	1.10	1.30	1.55	1.50	1.34	1.37	149
United Kingdom	2.12	2.49	2.44	2.50	2.43	2.28	2.42	2.61	2.89	3.02	2.29	2.05	2.25	6
EU-15	27.96	34.16	33.91	34.18	35.08	33.77	34.69	36.84	40.01	41.54	39.62	42.17	43.53	56

Source: Eurostat.

Candidate Countries

Table 7.11 offers basically the same information for the individual Candidate Countries as Table 7.5 does for the EU as a whole. The various countries offer a quite heterogeneous picture.

Whereas the energy consumption of the transport sector overtook that of industry at EU-15 level in the early 1990s, this is not true for the Candidate Countries as a whole. Cyprus and Malta both have a particular economic structure heavily influenced by the tourism sector: transport's share in total final energy consumption in 2001 is among the highest (with 55% and 60% respectively). To a lesser degree, the transport sector's consumption is also higher than that of industry in the three Baltic States, while for Hungary and Slovenia, it is broadly equivalent.

Looking at the various sub-sectors of transport, road transport as expected takes the lion's share in all countries. Again, only Cyprus and Malta registered substantial energy consumption in aviation (35% of the total transport consumption for both countries). Turkey is the only other country with a noticeable aviation share (11%).

Table 7.11 also offers an insight how the consumption has changed compared to 1990. The drastic economic changes in the Central and Eastern European countries are reflected by these figures.

Table 7.11: Candidate Countries: Final energy consumption (all products) of the transport sector - 2001 (1000 toe)

	BG	CY	CZ	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR
Final energy consumption	8 532	1 680	24 143	2 516	16 339	3 643	3 780	445	56 346	22 424	11 228	4 521	51 209
% change compared to 1990	-47%	+33%	-33%	-58%	-13%	-59%	+20%	+34%	-6%	-33%	-14%	+34%	+66%
	<i>of which:</i>												
Industry	3 560	408	9 682	582	3 570	682	692	69	17 375	9 311	4 549	1 317	17 269
% change compared to 1990	-60%	-4%	-50%	-79%	-45%	+2%	-77%	+240%	-32%	-58%	-22%	-10%	+45%
Services, households, etc.	3 055	345	9 475	1 283	9 367	2 076	1 946	110	29 832	9 126	5 302	1 831	22 275
% change compared to 1990	-34%	+76%	-31%	-48%	+2%	+12%	-55%	-1%	+11%	+33%	-4%	+88%	+133%
TRANSPORT	1 918	927	4 986	650	3 403	885	1 142	266	9 139	3 986	1 377	1 373	11 664
% change compared to 1990	-23%	+44%	+78%	-22%	+13%	+68%	-41%	+20%	+25%	-10%	-18%	+48%	+25%
	<i>of which:</i>												
Rail	71	2	279	48	171	77	67	-	531	296	3	34	224
% change compared to 1990	-67%	+14%	+2%	-27%	-37%	+346%	-41%	-	-51%	+5%	-17%	+15%	-8%
Road	1 698	602	4 487	574	3 012	764	1 037	173	8 256	3 562	1 375	1 311	9 953
% change compared to 1990	-13%	+45%	+94%	-21%	+17%	+50%	-15%	+16%	+39%	-1%	-13%	+50%	+19%
Air	149	322	214	16	220	27	35	93	350	115	0	28	1 241
% change compared to 1990	-47%	+41%	-3%	-54%	+34%	-73%	-91%	+30%	+71%	-51%	0%	+4%	+159%
Inland navigation	0	-	6	12	1	17	3	-	2	13	-	-	247
% change compared to 1990	-95%	-	:	+71%	:	:	:	-	-98%	-96%	-	-	-1%

Source: Eurostat.

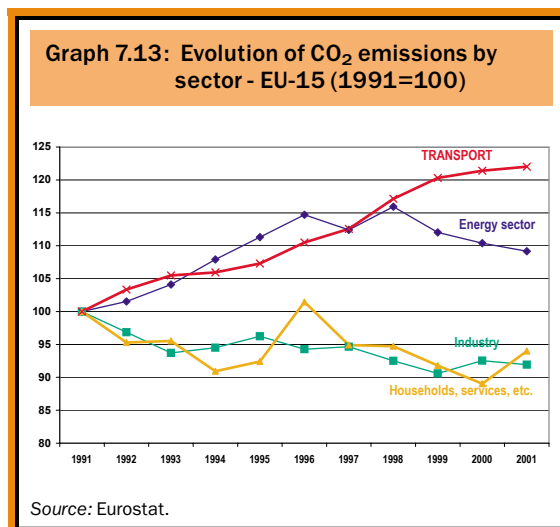
7.3. Emissions

The transport share (not including maritime and pipeline transport) of total final energy consumption in the EU stands at 32% in 2001 (see Table 7.5 in the previous chapter). Nearly the entire consumption of this sector consists of fossil fuels.

Fossil fuel combustion produces carbon dioxide (CO₂) and other emissions, many of them harmful to human health. The quantities and profile of these emissions depend on the quantity and quality of fuel used, the technology used in the combustion, the end-of-pipe technologies (filters, catalytic converters) and other factors such as speed, loading factor, temperature and state of maintenance of engines.

CO₂ increase of 22% for road transport in just one decade

Due to their role in global warming, CO₂ emissions are the most significant product of the use of fossil fuels. As visible in Table 7.12 and Graph 7.13, the CO₂ emissions of transport continue to increase steadily (+22% between 1991 and 2001) whereas those of industry and households, services, etc. tend towards a slight decline (-8% and -6% respectively for the same time period). Within the transport sector, road transport takes the lion's share.



Emission figures as presented in this chapter are based on Eurostat energy data; default conversion factors have been applied to calculate the carbon dioxide emissions.

Looking at the CO₂ emissions of the various countries, it appears that those of Ireland more than doubled over the last decade. Mainly the

Table 7.12: EU-15: emissions of CO₂ by sector (million t of CO₂)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Change 1991-2001 (%)
Total emissions from final energy consumption	1 970.2	1 945.9	1 946.6	1 923.0	1 952.6	2 027.3	2 000.4	2 021.5	2 014.8	2 014.8	2 049.9	4.0
Industry	544.2	527.0	510.0	514.3	523.6	512.9	515.1	503.4	492.9	503.5	500.3	-8.1
Households, services, etc.	679.9	647.9	649.5	618.2	628.3	689.9	645.3	644.0	624.1	605.4	639.1	-6.0
Transport	746.2	771.1	787.2	790.5	800.7	824.5	839.9	874.1	897.7	905.9	910.5	22.0
	of which:											
Belgium	23.0	24.4	24.6	25.0	24.9	26.3	27.2	28.3	28.4	28.6	28.0	21.4
Denmark	12.1	12.2	12.4	13.0	13.1	13.4	13.6	13.8	14.0	13.9	13.4	10.7
Germany	170.8	177.1	181.7	179.4	181.9	180.8	184.1	187.6	193.8	190.9	186.5	9.2
Greece	17.7	18.2	19.1	19.1	19.0	19.4	19.9	21.6	22.1	21.2	21.8	23.0
Spain	71.1	73.1	72.2	75.3	76.9	82.0	82.8	90.2	94.6	97.3	101.4	42.6
France	121.2	124.4	130.2	127.4	129.0	134.3	137.3	144.9	145.0	150.6	151.3	24.8
Ireland	6.0	6.1	6.1	6.8	6.4	8.0	8.7	9.8	10.9	11.6	12.7	113.1
Italy	99.6	104.1	106.2	106.4	108.9	109.8	111.8	118.5	120.2	119.7	121.7	22.1
Luxembourg	3.5	3.8	3.8	4.0	3.9	4.0	4.3	4.6	5.0	5.6	5.9	68.7
Netherlands	30.7	32.6	33.7	34.4	36.2	38.3	39.4	39.8	40.3	40.5	41.8	36.4
Austria	15.6	15.7	15.4	15.5	15.7	17.4	16.6	17.3	18.6	18.7	19.8	27.1
Portugal	11.8	12.7	13.2	13.8	14.4	15.1	15.6	16.9	17.9	19.4	19.5	65.5
Finland	12.1	12.0	11.8	12.2	12.0	11.8	12.5	12.6	12.9	12.9	13.2	8.6
Sweden	20.4	21.3	20.9	21.6	21.8	21.6	21.9	22.2	22.8	23.2	24.6	20.4
United Kingdom	130.6	133.4	135.8	136.7	136.5	142.1	144.2	145.9	151.0	151.8	149.0	14.1

Source: Eurostat.

Table 7.14: EU-15: Emissions of CO₂: share by transport mode (million t of CO₂)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Change 1991-2001 (%)
Total transport sector	746.2	771.1	787.2	790.5	800.7	824.5	839.9	874.1	897.7	905.9	910.5	22.0
	of which:											
rail transport	8.7	8.7	8.6	8.1	8.3	8.2	8.2	8.1	7.6	7.6	6.9	-20
road transport	634.3	655.8	668.4	668.4	675.6	693.5	704.8	728.8	746.4	751.4	762.3	20
air transport	82.3	85.2	88.7	92.5	96.2	101.5	106.6	117.0	124.8	130.4	126.0	53
inland navigation	20.7	21.2	21.2	21.4	20.5	21.2	20.1	20.0	18.7	16.4	15.1	-27

Source: Eurostat.

second half of the 1990s contributed to this high increase. Luxembourg and Portugal saw their transport-related CO₂ emissions grow by over 60%. On the other end, Germany's and Finland values increased by less than 10%; Germany even registered a decline since 1999.

Aviation: high altitude emissions a specific problem

When looking at the emissions at EU level of the various sub-sectors of transport (Table 7.14), it appears that due to the increasing share of electrified tracks (and thus the gradual increase in electric traction), CO₂ emissions from rail transport decreased by 20% between 1991 and 2001. Emissions generated in power plants for the electricity production used as tractive power is however excluded here.

On the other hand, and in line with its energy consumption, air transport showed the highest increase in CO₂ emissions (53% growth over the period 1991-2001). With the strong growth in traffic, the environmental impacts of air transport are growing as well. Air transport has its corresponding share in the greenhouse effect and the depletion of the ozone layer, where high altitude emissions might be a specific problem. At local level, in the immediate vicinity of airports, concerns focus on the potential health and environmental effects of noise and air pollution, especially from oxides of nitrogen (NO_x), volatile organic compounds and particulates.

Road transport remains by far the sub-sector producing the highest CO₂ volumes. The 762 million tonnes at EU-level in 2001 represent nearly 84 % of the entire volume emitted by the transport sector (excl. electricity for tractive power).

Resulting from an incomplete combustion of fuels, harmful pollutants may interact chemically to produce secondary pollutants like 'summer smog' and high ozone levels, mainly in large urban areas.

Euro IV standards for passenger cars in 2005 along with better fuels

Progress has been made in reducing the emissions from road vehicles. This not only concerns the level of CO₂ emitted (the reduction of which is mainly linked to the use of more fuel-efficient vehicles) but also the levels of noxious substances. Table 7.15 summarises the various emission standards applying to serial production vehicles in the European Union. Standards applicable for the year 2005 (passenger cars and lorries) and even 2008 (lorries) have already been set. The early establishment of these standards is important for the automotive industry, since it allows the preparation of serial production.

Certain Member States have begun to make fuels available with a sulphur content reduced to less than 50 ppm (parts per million), about one tenth of the values generally common at the end of the 1990s. The widespread availability of low-sulphur gasoline is important for the introduction of cars equipped with direct fuel injection (already widely introduced for diesel engines), offering considerable potential for fuel efficiency and allowing a further reduction of NO_x emissions. Fuels with reduced sulphur content (both gasoline and diesel) will be mandatory in the EU by 2005. Hence, the oil industry is currently investing substantially in the adaptation of its refineries.

Since 2000 new models of petrol-engined cars have been fitted with on-board diagnostics (OBD), constantly checking for proper functioning of the catalytic converter. OBD will become compulsory for diesel-engined cars from 2003, and for heavy commercial vehicles from 2005. In case of a deterioration of the vehicle's emission performance, OBD alerts the driver who should then have the vehicle repaired, ensuring emissions are minimised throughout the vehicle's operating life.

Table 7.15: European emission standards (applying to vehicles of serial production)

Cars							
Petrol engine		g/km					
	as from:	CO ¹	NO _x ¹	VOCs ¹			
EURO I	01.07.1992	4.05	0.49	0.66			
EURO II	01.01.1996	3.28	0.25	0.34			
EURO III	01.01.2000	2.30	0.15	0.20			
EURO IV	01.01.2005	1.00	0.08	0.10			
Diesel engine		g/km					
	as from:	CO ¹	NO _x ¹	VOCs ¹	PM ¹		
EURO I	01.07.1992	2.88	0.78	0.2	0.14		
EURO II	01.01.1996	1.06	0.73	0.19	0.10		
EURO III	01.01.2000	0.64	0.50	0.06	0.05		
EURO IV	01.01.2005	0.50	0.25	0.05	0.025		
Heavy duty vehicles (lorries)			g per kW				
	as from:	Test cycle	CO ¹	VOCs ¹	NO _x ¹	Particulate matter	
						< 85 kW	> 85 kW
EURO I	01.10.1993	13-mode ²	4.5	1.1	8	0.612	0.36
EURO II	01.10.1996	13-mode ²	4.0	1.1	7	0.15	
EURO III	01.01.2000	ESC ²	2.1	0.66	5	0.10	
EURO III	01.01.2000	ETC ²	5.5	0.78	5	0.16	
EURO IV	01.10.2005	ESC ²	1.5	0.46	3.5	0.02	
EURO IV	01.10.2005	ETC ²	4.0	0.55	3.5	0.03	
EURO V	01.10.2008	ESC ²	1.5	0.46	2	0.02	
EURO V	01.10.2008	ETC ²	4.0	0.55	2	0.03	

(1) CO = carbonmonoxide; NO_x = nitrogenoxide; VOCs = volatile organic compounds; PM = particulate matter.

(2) 13-mode = according to 88/77/EEC - engine mounted at test stand and measured in 13 stationary modes; ESC = European steady cycle; ETC = European transient cycle.

Source: Eurostat.

Particulate filters for diesel engines

In 2000, leaded petrol was phased out in 12 of the EU Member States. Italy, Greece and Spain obtained derogations, and in those countries leaded petrol disappeared roughly one year later. Over the past 15 years, lead emissions from road traffic have fallen in proportion to the increase in the share of unleaded petrol, and are now virtually at zero.

In certain countries, the share of diesel fuel sales clearly exceeds those of unleaded gasoline (Table 7.7 in Chapter 7.2 — *Energy consumption*). The burning of diesel fuel raises the question of particulate emissions. Vehicle emission standards have regulated the mass of particulates emitted, and these have been, and will continue to be reduced. However, there is the suspicion that human health is particularly susceptible to the very smallest sizes of particle (nano-particles). Ironically, a consequence of reducing the mass of total particulate emissions has been that greater numbers of these nano-particles are emitted. Particulate filters (or traps) can reduce the mass and number of particles emitted and several manufacturers have already begun to fit them to their diesel vehicles. It is expected that particulate filters will become largely available in the near future.

Aircraft engine manufacturers anticipate standard

In the aviation industry, ICAO (International Civil Aviation Organisation) continues to play a leading role in developing policy guidance on the application of regulatory and economic measures related to aviation environmental protection. In the past, standards recommended at ICAO level have been used as benchmarks for Community legislation. The Committee on Aviation Environmental Protection (CAEP) reached a compromise in 1998 for a new recommendation ('CAEP/4') on the limits of oxides of nitrogen (NO_x). Without going into details, this compromise means a reduction in NO_x emissions of 5 to 16 % depending on the operating conditions. A similar proposal had already been made in 1995, but at that time it was not agreed upon. The lack of consensus in 1995 is explained by doubts over technical feasibility and environmental benefit, together with a fear that the value of the existing aircraft fleet would be affected by the introduction of restrictive operating rules when new proposals would come into effect. The fact that a consensus was reached in 1998 was influenced by various factors: if no widespread consensus were reached, the EU would have opted for 'regional action'; furthermore, some aircraft engine

manufacturers have taken action in anticipation of more stringent NO_x standards. The new requirements apply to new engine designs only. Since future production of existing engines is not immediately subject to the new standard, it is believed that the value of the existing fleet is protected. Existing engines must comply with the new standards by 2008.

New emission parameters necessary

In recent years, research has been carried out on aircraft emissions at high altitude. However, all standards so far, including the recent 'CAEP/4' standard, are based on landing and take-off (LTO) cycle-based parameters. The development of new parameters for the assessment of an aircraft's emissions to replace the existing LTO parameters and to establish climb and cruise parameters is a high priority in the frame of the 'CAEP/5' work programme, in which the Commission actively participates.

Noise: a plague of modern civilisation

The traffic and transport linked emission of noise has been getting increased attention over the last years.

The present scarcity of consistent statistics at European level should change in the future. Table 7.16 outlines the European Union's efforts to reduce noise emissions by setting production standards for various types of vehicle. It should be noted that an increase of 3 dB(A) corresponds to a doubling of sound intensity; however, humans perceive a 10 dB(A) increase as a doubling of noise (loudness).

Measures taken in road transport include the wider use of 'quieter' car tyres with low rolling resistance (for increased fuel efficiency) and the use of noise-absorbing tarmac as well as mitigation measures like the construction of noise barriers along roads through or near residential areas. Measures taken by the railway industry are divided between infrastructure operators (acoustic grinding of rails, noise barriers, speed

limits at night) and train operators (replacement of cast-iron brakes with low-noise composite materials). Newly constructed high-speed train tracks are mostly planned and built with noise barriers along sensitive areas.

Noise 'footprints' reduced and lower gaseous emissions

In the three decades since aviation and the environment first rose as an issue, there has been much change. The noise levels of modern aircraft are 10 to 15 decibels lower than previous generations of aircraft. As an example, a modern Airbus A320 has an 80 % smaller noise 'footprint' (noise area contour measured on the ground) than the older Boeing 727.

Lately, many European States have expressed the need for more stringent noise emission standards for their airports. Since the first of April 2002, the EU enforced the use of aircraft that at least comply with the 'Chapter 3' noise emission standards. The United States already phased out the previous 'Chapter 2' standard in 1999.

Awaiting aircraft according to 'Chapter 4'

In June 2001, the ICAO Council adopted a new noise certification standard, to become 'Chapter 4'. The new standard will be obligatory applicable to new aircraft types submitted for certification after 1 January 2006 and voluntarily for aircraft originally certified according to 'Chapter 3' standards. The new noise standard is established for certification purposes and not as a basis for restrictions on operation of aeroplanes.

Avoid economic hardship for developing nations

The adoption of the new standard should be considered as an important step towards the improvement of the noise performance of air transport activities. However, since most of the current production aircraft already comply with the Chapter 4 standard, the impact of the adoption of 'Chapter 4' will only materialise over a longer period as fleets are modernised and

Table 7.16: Noise emission limits - EU standards - dB(A)¹

Vehicle category	1972	1980	1982	1989-90	1995-96	1997
Passenger car ²	82	.	80	77	74	.
Urban bus ²	89	.	82	80	78	.
Heavy lorry ²	91	.	88	84	80	.
Motorcycles < 80cm ³ ³	.	78	.	77	.	75
Motorcycles > 80 - < 175cm ³ ³	.	80-83	.	79	.	77
Motorcycles > 175cm ³ ³	.	83-86	.	82	.	80
Motor assisted cycle < 25 km/h	.	.	.	.	.	66
Motor assisted cycle > 25 km/h	.	.	.	.	.	71

(1) db (A): A-weighted decibels: logarithmic scale, +3db(A) = doubling of sound intensity.

(2) Method of measurement described in Council Directive 92/97/EEC of 10 November 1992, Official Journal L371 of 19/12/1992.

(3) Directive 97/24/EC of 17 June 1997, Official Journal L226 of 18/8/1997.

Source: DG Energy and Transport.

renewed. Accompanying measures are therefore required to further improve the noise situation: it is now widely recognised that certain operating restrictions can be imposed on an airport-by-airport basis (mainly for so-called 'city-airports'). Despite regulatory measures taken at EU-level, undue economic hardship for operators from developing nations should be avoided. The Commission has taken steps allowing for the granting of exemptions where appropriate. Overall, a further improvement in the reduction of noise pressure can be expected in the long term, it remains however to be seen if these improvements are not offset by a further increase of the air traffic intensity.

Possible rebound effect from more efficient air space management

Another area that offers potential for reducing the environmental impact of aviation concerns the improvement of air space management and air traffic control. Air traffic management delays and inefficient routings increase aircraft noise and gaseous emissions. There is a broad consensus that there is potential for improvement, not only with regard to fuel savings but also in increased safety, reliability and efficiency. Based on previous studies, the Association of European Airlines (AEA) estimates that the elimination of these inefficiencies in Europe could result in a CO₂ reduction of 6 to 12 %. Eurocontrol, the European Organisation for the Safety of Air Navigation, estimated fuel savings of 7 to 8 % for gate-to-gate direct routes (less if applied within en route

airspace only). The European Commission is aware of this and supports the strengthening of the existing body Eurocontrol, which has 28 European members, 14 of them in EU Member States.

It is however not known to what extent the introduction of capacity and efficiency enhancing measures may result in attracting additional air traffic ('rebound effect').

Efficiency of use

A key to a further reduction of pollutant emissions is the efficiency of use of all transport modes. The more vehicles are efficiently used (higher occupancy rate, eco-driving style), the less pollutant emissions per person per kilometre travelled are generated. Occupancy rates have tended to decrease for more than a decade in Europe both for passenger cars and for buses and coaches. The opposite trend appears in air transport, where a steady increase in the occupancy rate has taken place. Occupancy rates for rail transport, at the level of the European Union, have remained more or less constant.

Regarding freight transport, efficiency has been increased in road transport, also due to a further liberalisation of this sector (cross-trade, cabotage – see Chapter 5.1), but especially for rail and air transport during the last two decades, even if it seems that the efficiency of the latter mode has - since a number of years now - come to a limit which is difficult to improve.

Emissions of maritime transport

As for energy consumption, a clear allocation to individual Member States and even EU-15 of CO₂ emitted by international maritime vessels is not possible. It should be recalled that the combustion of marine fuel takes place largely in territories/waters other than those where the fuel has been bunkered. This shows the limits of a territorial allocation of emissions. Bearing this in mind, Table 7.17 shows the emissions of CO₂ of the individual countries, calculated on the basis of fuel deliveries. On the basis of EU-wide sales, it appears that throughout a large period of the 1990s, emissions have remained stable. Only for 1997 and 1998, a noticeable increase has been registered.

Table 7.17: Total internal emissions of CO₂ by maritime vessels (in million t)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Change 1985-1998 (%)
Belgium	13.0	13.3	13.2	13.6	13.0	12.4	14.3	16.1	17.2	32
Denmark	3.0	2.7	2.8	4.2	4.6	5.0	4.7	4.6	4.3	43
Germany	7.8	6.6	5.6	7.0	6.5	6.5	6.4	6.8	6.4	-18
Greece	8.0	7.4	8.5	9.8	10.4	11.2	9.9	9.9	11.0	38
Spain	12.0	12.1	12.3	10.7	9.7	10.0	14.6	18.0	18.9	58
France	8.0	8.3	8.1	7.6	6.7	7.9	8.5	9.3	9.0	13
Ireland	0.1	0.1	0.0	0.2	0.1	0.4	0.5	0.5	0.5	400
Italy	8.4	8.0	7.7	7.7	7.4	7.7	7.3	7.5	8.3	-1
Luxembourg	-	-	-	-	-	-	-	-	-	-
Netherlands	34.4	35.2	35.6	36.9	35.2	35.6	36.3	38.5	38.8	13
Austria	-	-	-	-	-	-	-	-	-	-
Portugal	1.9	1.9	1.9	1.6	1.5	1.5	1.6	1.6	1.2	-37
Finland	1.8	1.7	2.1	1.7	1.3	1.0	1.2	1.3	1.6	-11
Sweden	2.1	2.5	2.8	2.8	3.3	3.3	3.5	4.1	4.9	133
United Kingdom	7.8	7.7	7.8	7.6	7.1	7.6	8.2	9.1	9.5	22
EU-15	108.4	107.6	108.4	111.4	107.1	110.1	116.9	127.3	131.8	22

Source: Eurostat.

Candidate Countries

Table 7.18 offers data on CO₂ emissions of the various sub-sectors of transport for the period 1991 – 2001. It is recalled that the figures are based on energy data and that default conversion factors have been applied. As the data as presented in Table 7.18 have been compiled recently, they should be read with care as future corrections are likely to happen.

However, general tendencies can easily be detected: in most Candidate Countries, CO₂ emissions of rail transport are declining. As for the EU Member States, this is certainly due to an increased share of electrified tracks, but again, emissions generated in power plants for the electricity production used as tractive power is excluded here. Total CO₂ emissions linked to rail transport are thus higher.

Road transport expectedly takes the highest share in transport related CO₂ emissions. A particular high increase was calculated for the Czech Republic and Slovenia although data tend to fluctuate in the more recent years. The three Baltic States (Estonia, Latvia and Lithuania) show a tendency towards a general decrease; the yearly figures fluctuate however considerably.

CO₂ emissions from air transport increased particularly strong in Slovenia and Turkey, whereas a decline was calculated for the Baltic States, Bulgaria and Romania.

Table 7.18: Candidate Countries: CO₂ emissions from transport (in 1000 tonnes)

CO ₂ emissions from rail transport											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
BG	252.1	307.7	352.1	261.7	232.0	139.8	146.0	127.1	117.8	117.8	102.3
CY	:	:	:	:	:	:	:	:	:	:	:
CZ	:	:	:	:	:	403.1	189.1	179.8	322.5	297.7	303.9
EE	149.3	103.8	111.7	109.8	107.0	116.2	506.9	132.7	142.6	133.3	124.0
HU	427.6	367.3	333.2	323.9	313.2	311.4	302.2	291.5	322.5	268.5	260.6
LV	:	:	257.4	226.3	235.6	235.6	248.1	226.3	:	201.5	207.7
LT	477.5	359.7	353.5	375.2	241.9	251.2	241.9	232.5	207.7	217.0	192.2
MT	-	-	-	-	-	-	-	-	-	-	-
PL	1 139.4	798.3	786.6	867.6	843.4	718.0	643.9	602.3	558.1	511.6	499.2
RO	:	999.0	961.0	860.3	872.7	893.0	898.0	767.2	623.2	896.0	445.7
SK	:	:	:	:	:	:	:	:	:	:	:
SI	:	:	:	:	:	:	:	:	:	:	:
TR	603.5	603.5	644.0	659.7	755.7	774.2	690.5	635.4	620.1	620.1	511.6
CO ₂ emissions from road transport											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
BG	3 315.0	4 077.3	4 920.9	4 300.3	4 527.8	4 437.9	3 977.9	4 940.5	5 103.7	4 793.2	4 962.8
CY	1 112.3	1 281.9	1 318.9	1 352.6	1 436.0	1 485.4	1 550.1	1 624.2	1 666.9	1 676.0	1 802.1
CZ	6 090.3	7 635.4	7 736.8	8 441.2	7 142.9	9 448.3	9 671.6	9 936.2	12 258.0	10 641.9	13 338.6
EE	1 953.9	937.4	1 013.8	1 243.8	1 247.7	1 356.9	1 413.6	1 476.9	1 468.6	1 468.5	1 698.6
HU	6 777.1	6 615.6	6 657.0	6 491.9	6 705.9	6 703.1	7 124.4	7 989.4	8 475.2	8 484.8	8 952.6
LV	2 607.2	2 339.4	1 620.2	1 784.7	1 742.6	1 709.2	1 690.1	1 688.6	1 915.2	1 708.0	2 264.6
LT	4 085.7	2 572.2	2 283.7	1 925.1	2 620.0	2 899.7	3 302.1	3 524.6	3 144.2	2 763.0	3 050.1
MT	499.9	518.3	585.2	585.2	527.3	694.4	694.4	455.3	473.7	626.7	519.8
PL	19 115.9	19 861.0	19 430.2	20 334.6	21 065.3	24 156.9	25 680.3	25 343.8	28 419.8	24 134.9	24 100.9
RO	8 936.0	10 762.1	6 758.5	7 451.3	7 310.8	10 173.5	9 683.7	9 416.5	7 322.5	8 084.2	10 556.5
SK	3 815.0	3 902.6	3 423.1	3 733.8	4 163.0	3 884.5	4 462.8	4 498.3	4 545.7	4 375.1	4 092.3
SI	2 412.4	2 476.2	3 003.7	3 360.2	3 746.3	4 261.8	4 464.2	3 924.9	3 716.1	3 716.4	3 859.8
TR	24 094.0	24 413.6	29 228.3	27 827.2	30 553.9	32 180.8	29 342.5	26 558.9	29 247.3	30 646.1	29 273.2
CO ₂ emissions from air transport											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
BG	569.3	937.6	1 211.7	1 001.5	825.0	569.3	611.9	447.5	365.3	298.4	441.4
CY	584.5	752.0	703.3	721.5	791.5	758.1	745.9	785.5	803.7	858.5	955.9
CZ	459.4	526.4	429.1	526.5	560.1	426.1	487.1	575.3	544.9	593.6	633.2
EE	106.6	36.5	54.8	45.7	54.8	48.7	66.9	48.6	66.9	63.9	48.7
HU	383.6	404.9	371.4	560.2	538.9	572.4	545.0	578.4	621.0	660.5	651.5
LV	292.3	271.0	76.1	63.9	76.1	97.4	97.4	103.5	109.6	79.2	79.2
LT	1 516.1	197.9	112.6	118.7	121.8	100.5	94.4	85.2	79.2	79.2	103.5
MT	243.6	240.5	240.5	240.5	337.9	325.8	341.0	496.2	517.6	325.8	277.0
PL	747.8	700.2	940.6	1 080.5	1 117.1	1 138.5	791.4	773.2	1 089.8	1 102.0	1 038.1
RO	490.2	736.7	761.1	511.5	566.3	48.7	389.6	334.7	392.6	392.6	340.9
SK	:	:	:	:	:	:	:	:	:	:	:
SI	30.4	33.5	51.7	54.8	60.9	54.8	57.8	54.8	63.9	73.0	82.2
TR	1 470.5	1 628.8	2 048.9	2 447.7	3 409.7	3 680.7	4 396.1	4 630.5	3 504.1	3 738.5	3 677.6
CO ₂ emissions from inland navigation											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
BG	:	:	:	:	:	:	:	:	:	:	:
CY	:	:	:	:	:	:	:	:	:	:	:
CZ	:	:	:	:	:	:	:	:	:	:	18.6
EE	18.6	15.5	15.5	12.4	12.4	21.7	18.6	18.6	15.5	21.7	37.2
HU	:	:	:	:	:	:	:	3.1	:	:	3.1
LV	383.0	386.1	764.1	721.1	469.7	304.1	221.3	46.4	:	24.8	52.5
LT	:	3.1	3.1	3.1	3.1	15.5	15.5	12.4	9.3	9.3	9.3
MT	:	:	:	:	:	:	:	:	:	:	:
PL	181.4	150.8	61.9	24.8	89.4	52.7	55.8	40.3	68.2	18.6	6.2
RO	1222.54	1089.19	412.95	400.22	165.46	464.82	1060.96	682.37	679.34	351.24	40.31
SK	:	:	:	:	:	:	:	:	:	:	:
SI	:	:	:	:	:	:	:	:	:	:	:
TR	638.3	761.0	713.1	615.9	677.7	693.1	674.5	699.4	635.0	601.3	771.7

Source: Eurostat.

Statistical sources and country codes

1. Main European legal acts on transport statistics

- Council Directive 80/1119/EEC of 17 November 1980 on statistical returns in respect of carriage of goods by inland waterways (OJ L 339, 15.12.1980)
- Regulation (EC) No 91/2003 of the European Parliament and of the Council of 16 December 2002 on rail transport statistics (OJ L 14, 21.01.2003)
- Council Regulation (EC) No 1172/98 of 25 May 1998 on statistical returns in respect of carriage of goods by road (OJ L 163, 6.6.1998 replaces Council Directive 78/546/EEC of 12 June 1978 and Council Directive 89/462/EEC of 18 July 1989).
- Regulation (EC) No 437/2003 of the European Parliament and of the Council of 27 February 2003 on statistical returns in respect of the carriage of passengers, freight and mail by air (OJ L 66, 11.03.2003)
- Council Directive 95/64/EC of 8 December 1995 on statistical returns in respect of carriage of goods and passengers by sea (OJ L 320, 30.12.1995)

2. European Commission

- **Eurostat**
Statistical Office of the European Communities
Unit D-4
Bech building, 5, rue Alphonse Weicker
L-2721 Luxembourg
Tel. (352) 43 01-1
<http://europa.eu.int/comm/eurostat/>
- **Directorate-General for Energy and Transport**
Rue de la Loi/ Wetstraat 200
B-1049 Brussels
E-mail: tif@cec.eu.int

3. International statistical sources

- **United Nations - Economic Commission For Europe (UNECE)**
Palais des Nations, CH-1200 Geneva
Tel.: (41-22) 917 24 53
Fax: (41-22) 917 00 39
www.unece.org
- **European Conference of Ministers of Transport (ECMT)**
2-4, rue Louis David, F-75016 Paris
Tel.: (33-1) 45 24 97 22
Fax: (33-1) 45 24 97 42
www.oecd.org/cem/

□ Airclaims Limited (Airclaims)

Cardinal Point, Newall Road - Heathrow Airport
Hounslow TW6 2AS
Tel.: (44) 208 897 1066
Fax: (44) 208 897 0300
www.airclaims.co.uk

□ International Road Federation (IRF)

Chemin de Blandonnet 2, CH-1214 Vernier
Tel.: (41-22) 306 02 60
Fax: (41-22) 306 02 70
www.irfnet.org

□ International Union (Association) of Public Transport (UITP)

avenue Herrmann Debroux 17, B-1060 Brussels
Tel.: (32-2) 673 61 00
Fax: (32-2) 663 66 23
www.uitp.com

□ International Union of Railways (UIC)

16, rue Jean Rey, F-75015 Paris
Tel.: (33-1) 44 49 22 80
Fax: (33-1) 44 49 21 36
www.uic.asso.fr

□ International Underwriting Association (IUA)

3 Minster Court, Mincing Lane, London EC3R 7DD, UK
Tel.: (44) 207 617 4444
Fax: (44) 207 617 4440
www.iua.co.uk

□ Lloyd's / Lloyd's Maritime Information System

One Lime Street, London EC3M 7HA, UK
Tel. : (44) 207 327 1000
www.lloyds.com

4. National statistical sources

□ Belgique/België

Institut National de Statistique (INS)
rue de Louvain 44, B-1000 Brussels
Tel.: (32-2) 548 62 60
Fax: (32-2) 548 62 62
www.statbel.fgov.be

□ Danmark

Danmarks Statistik
Sejrøgade 11, Postboks 2550,
DK-2100 Copenhagen
Tel.: (45) 39 17 39 17
Fax: (45) 39 17 39 99
www.dst.dk

□ Deutschland

Statistisches Bundesamt
Gustav-Stresemann-Ring 11, Postfach 5528,
D-65189 Wiesbaden
Tel.: (49-611) 751
Fax: (49-611) 75 31 83
www.destatis.de

- **Ellas (Greece)**
National Statistical Service of Greece
 14-16 Lycourgou Street, GR-10166 Athens
 Tel.: (30) 210 3289 0000
 Fax: (30) 210 3249 461
www.statistics.gr
 - **Espaa**
Instituto Nacional de Estadística (INE)
 Paseo de la Castellana 183, E-28046 Madrid
 Tel.: (34) 91 583 9100
 Fax: (34) 91 579 2713
www.ine.es
 - **France**
Institut National de la Statistique et des Etudes Economiques (INSEE)
 18, boulevard Adolphe Pinard, F-75675 Paris Cedex 14
 Tel.: (33-1) 41 17 50 50
 Fax: (33-1) 41 17 66 66
www.insee.fr
 - **Ireland**
Central Statistical Office
 Skehard Road, Cork, Ireland
 Tel.: (353-214) 535 113
 Fax: (353-214) 535 117
www.cso.ie
 - **Italia**
Instituto Nazionale di Statistica (ISTAT)
 Via Cesare Balbo 16, I-00184 Rome
 Tel.: (39-06) 4673 3105
 Fax: (39-06) 4673 3107
www.istat.it
 - **Luxembourg**
Service Central de la Statistique et des Etudes Economiques (STATEC)
 6, boulevard Royal, L-2013 Luxembourg
 Tel. : (352) 4781 42 52
 Fax: (352) 46 42 89
www.statec.lu
 - **Nederland**
Centraal Bureau voor de Statistiek (CBS)
 Prinses Beatrixlaan 428, Postbus 959,
 NL-2273 XZ Voorburg, Netherlands
 Tel.: (31-70) 337 38 00
 Fax: (31-70) 387 74 29
www.cbs.nl
 - **Österreich**
Statistik Austria
 Hintere Zollamtstrasse 2b, Postfach 9000,
 A-1033 Vienna
 Tel.: (43-1) 711 28 79 85
 Fax: (43-1) 711 28 77 28
www.statistik.gv.at
 - **Portugal**
Instituto Nacional de Estatística (INE)
 Avenida Antonio José de Almeida 2,
 P-1000-043 Lisboa
 Tel.: (351) 21 842 6100
 Fax: (351) 21 842 6375
www.ine.pt
 - **Suomi/Finland**
Statistics Finland
 Työpajakatu 13, FIN-00580 Helsinki
 Tel. : (358-9) 17 34-1
 Fax: (358-9) 17 34 22 91
www.stat.fi
 - **Sverige**
Statistics Sweden
 Karlavägen 100, S-115 81 Stockholm
 Tel.: (46-8) 5069 4000
 Fax: (46-8) 5069 4199
www.scb.se

Swedish Institute for Transport and Communications Analysis (SIKA)
 PO Box 17 213, S-10462 Stockholm
 Tel.: (46-8) 506 206 00
 Fax: (46-8) 506 206 10
www.sika-institute.se
 - **United Kingdom**
Office for National Statistics
 1 Drummond Gate - London SW1V 2QQ, United Kingdom
 Tel.: (44) 845 601 3034
 Fax: (44) 1633 652 747
www.statistics.gov.uk
- Candidate Countries:**
- **Bulgaria**
National Statistical Institute
 2, P. Volov Str.
 BG-1038 Sofia
www.nsi.bg
 - **Cyprus**
Statistical Service of Cyprus
 Michalakis Karaolis Street
 1444 Nicosia
www.mof.gov.cy/mof/cystat/
 - **Czech Republic**
Czech Statistical Office
 Na padesatem 81
 100 82 Praha 10
www.czso.cz
 - **Estonia**
Statistical Office of Estonia
 15 Endla Street
 15174 Tallinn
www.stat.ee
 - **Hungary**
Hungarian Central Statistical Office
 Keleti Karoly u. 5-7
 HU-1024 Budapest
www.ksh.hu
 - **Latvia**
Central Statistical Bureau of Latvia
 Lacplesa Street 1
 LV-1301 Riga
www.csb.lv

- **Lithuania**
Statistics Lithuania
 29 Gedimino pr.
 LT-2746 Vilnius
www.std.lt
- **Malta**
National Statistics Office
 Lascaris
 Valletta CMRO2
www.nso.gov.mt
- **Poland**
Central Statistical Office
 Al. Niepodleglosci 208
 PL-00925 Warsaw
www.stat.gov.pl
- **Romania**
National Institute of Statistics
 16, Libertatii Avenue, Sector 5
 RO-70542 Bucharest
www.insse.ro
- **Slovak Republic**
Statistical Office of the Slovak Republic
 Mileticova 3
 824 67 Bratislava
www.statistics.sk
- **Slovenia**
Statistical Office of the Republic of Slovenia
 Vozarski pot 12
 SI-1000 Ljubljana
www.stat.si
- **Turkey**
State Institute of Statistics
 114 Necatibey Caddesi
 06100 Ankara
www.die.gov.tr/ENGLISH/index.html

EFTA Countries:

- **Iceland**
Statistics Iceland
 Borgartuni 21a
 IS-150 Reykjavik
www.statice.is
- **Liechtenstein**
Amt für Volkswirtschaft / Statistik
 Gerberweg 5
 FL-9490 Vaduz
www.llv.li/amtstellen/llv.avw.statistik/
- **Norway**
Statistics Norway
 Kongens gt. 6
 N-0033 Oslo 1
www.ssb.no
- **Switzerland**
Swiss Federal Statistical Office
 Espace de l'Europe 10
 CH-2010 Neuchâtel
www.statistik.admin.ch

5. Country codes

- **EU Member States**

 - BE Belgium
 - DK Denmark
 - DE Germany
 - EL Greece
 - ES Spain
 - FR France
 - IE Ireland
 - IT Italy
 - LU Luxembourg
 - NL Netherlands
 - AT Austria
 - PT Portugal
 - FI Finland
 - SE Sweden
 - UK United Kingdom
- **Candidate Countries**

 - BG Bulgaria
 - CY Cyprus
 - CZ Czech Republic
 - EE Estonia
 - HU Hungary
 - LV Latvia
 - LT Lithuania
 - MT Malta
 - PL Poland
 - RO Romania
 - SK Slovak Republic
 - SI Slovenia
 - TR Turkey
- **EFTA Countries**

 - IS Iceland
 - LI Liechtenstein
 - NO Norway
 - CH Switzerland