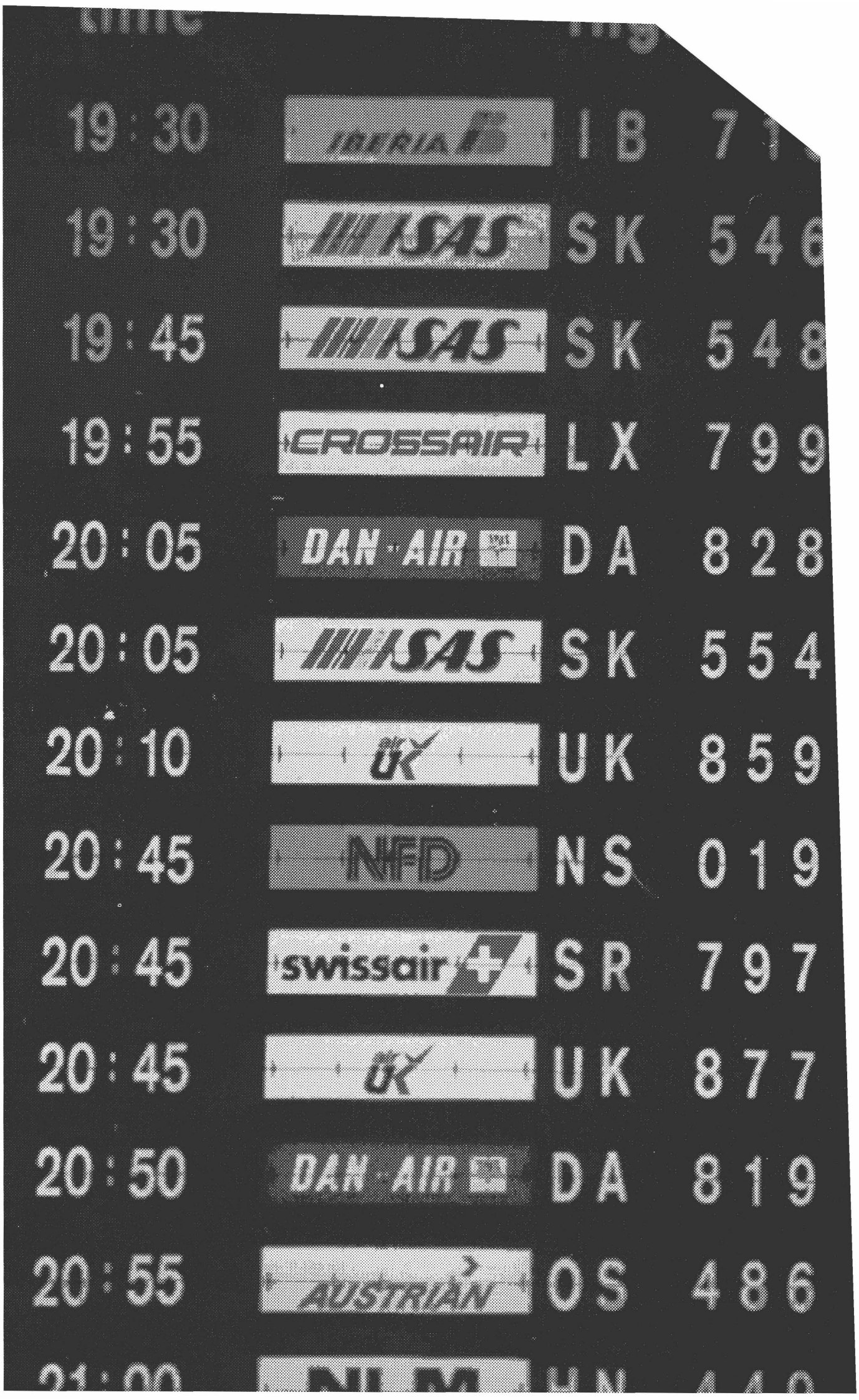
Transport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20 : 05 SAS SK 554
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20 : 45 NFD NS 019
20 : 45 swissair SR 797
20 : 45 UK UK 877
20 : 50 DAN AIR DA 819
20 : 55 AUSTRIAN OS 486

Transport

The EC transport sector is adapting itself to the challenges of the 1990's, through the development of infrastructures and production means and through the freedom to provide services and the elimination of distortions of competition.

Competition between different modes of transport is increasing.

At the same time cooperation and complementarity among them is also developing as in the field of combined transport.

For the transport sector no consistent production figures are available, but based on input-output analysis estimated production in the transport sector is roughly twice the value added.

The total value added generated by the EC transport sector in 1989 was 167 billion ECU.

The supply of international transport services by EC transport companies in 1988 was 66 billion ECU 58% of which was exported outside the EC.

This roughly equalled total imports of transport services.

Intra-EC trade is 42% of total trade and the EC is a net exporter of transport services with a balance of 0.8 billion ECU.

This makes apparent consumption of transport services in the EC roughly equal to production.

25

Sector definition

The transportation sector is primarily engaged in the conveyance of passengers and goods and consists of the NACE-classes:

- 71 Railways;
- 72 Other land transport, (which include urban rail, tramway, local bus transport, road passenger transport and road merchandise transport);
- 73 Inland waterway transport;

Table 1
Main indicators of the EC transport sector

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990(²)
Value added (bilion ECU)	82	91	97	104	111	119	128	138	147	157	167	179
Investments (bilion ECU)	26	30	31	32	33	36	39	42	46	49	52	57
Employees (1000's) (¹)	4 282	4 462	4 415	4 342	4 267	4 243	4 262	4 483	4 482	4 504	4 527	4581

(¹) Excluding Greece
(²) Estimated
Source: Eurostat, national accounts

- 74 Sea transport and coastal shipping;
- 76 Supporting services to transport;
- 77 Agents, storage and warehousing.

The economic importance of the industry in the EC economy

The gross value added at market prices of the transport sector is 4% of EC GDP.

The importance of the sector is greater than its contribution to GDP, because of its importance in economic development and especially in European integration.

Production of services is not statistically registered. Value added generated by the transport sector rose steadily during the 1980's to a level of 167 billion ECU in 1989.

Investments grew to 52 billion ECU, the investment ratio remaining at 31% during the 1980's. Investments and value added both doubled over the decade. Contrary to this development, employment grew only marginally.

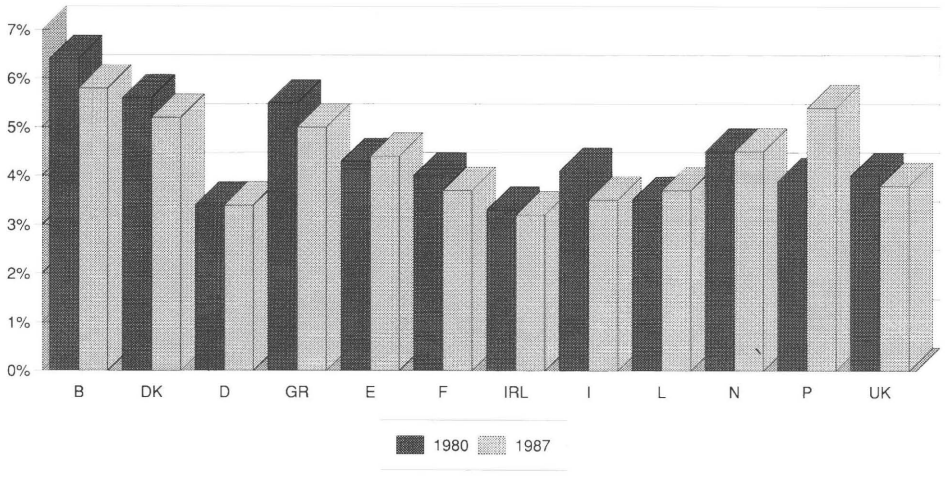
In 1989, 58% of transport services for the EC was generated by inland transport services, 15% by maritime and air transport and 27% by auxiliary transport services.

This ratio has not changed during the 1980's. Figure 1 shows the share of transport services in the GDP of EC Member States.

For 1987 the shares of value added by transport in national GDP ranged between 3.3% for Germany and 5.8% for Belgium.

Although the range of variation has diminished during the decade, there has been little change either in the ranking or in the average share.

Figure 1
Share of transport sector in GDP
(%)



Source: NEI

Trade

Table 2 shows EC trade in transport services by branch. Total trade in 1988 was 66.4 billion ECU worth of exports and 65.7 billion ECU worth of imports.

Intra-EC trade represents 42% of total trade.

Road freight, rail and inland waterway transport considered all together under the heading "other transport" determine the structure of EC total trade and intra EC trade. The second major transport mode on the supply side is sea freight which accounts for roughly one third of trade in transport services.

At present the shares of EC and non-EC suppliers on the EC market for international transport services is roughly equal.

Industry structure

The relative importance of the various means of transport has changed considerably over three decades.

The major shift has been from rail to road haulage. International haulage accounts for double the tonnage and triple the ton/km of railroad transport, where it used to be the contrary.

By way of products transported there has been a shift from bulk goods to special cargo. This is one reason why railroad and inland shipping, most suited to the transportation of bulk goods, have lost importance. For most commodity groups the share of haulage has greatly increased, in-

Table 2
EC trade in transport services (1)

(mio ECU)	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Total Trade										
Credit EC12 with world										
Sea freight	15 772	18 681	21 503	21 072	20 202	22 553	23 623	20 722	20 307	21 615
Sea pass.serv.	677	795	877	1 029	1 167	1 221	1 408	1 366	1 378	1 472
Air freight	1 534	1 618	2 137	2 259	2 276	2 770	3 096	3 093	3 134	3 076
Air pass.serv.	5 803	6 608	8 259	9 348	10 155	11 609	12 311	10 691	11 269	11 476
Other transport (2)	14 942	19 487	21 874	23 819	23 260	26 278	28 115	24 116	24 732	28 762
Total	38 729	47 189	54 651	57 527	57 060	64 431	68 554	59 989	60 820	66 400
Debit EUR12 with world										
Sea freight	16 382	18 662	22 323	21 870	22 181	25 324	26 270	23 103	22 680	23 555
Sea pass. serv.	427	494	553	589	633	736	802	814	799	897
Air freight	885	944	1 448	1 463	1 386	1 778	1 885	1 681	1 741	1 950
Air pass.serv.	3 849	4 350	6 117	6 807	7 360	8 231	8 830	8 794	9 800	11 035
Other transport (2)	14 351	18 098	21 699	23 703	23 830	25 713	27 095	24 018	24 983	28 248
Total	35 895	42 549	52 140	54 431	55 390	61 782	64 883	58 412	60 006	65 688
Intra EC Trade										
Credit EUR12 with EUR12										
Sea Freight	6 440	7 496	8 758	8 471	7 974	8 871	9 387	8 127	8 272	8 567
Sea pass.serv.	374	437	493	567	648	680	817	805	821	859
Air freight	379	403	602	581	597	740	854	840	897	855
Air pass.serv.	1 687	1 941	2 560	2 741	2 962	3 315	3 653	3 405	3 141	3 970
Other transport (2)	8 124	10 405	11 603	12 434	12 125	13 563	14 145	12 067	12 710	13 934
Total	17 072	20 781	24 030	24 992	24 184	27 144	28 406	25 176	25 493	27 806
Debit EUR12 with EUR12										
Sea freight	5 993	6 801	7 853	7 955	7 704	8 963	9 000	7 999	7 861	8 708
Sea pass.serv.	296	343	347	361	384	462	497	491	465	537
Air freight	321	332	520	516	491	630	675	647	691	794
Air pass.serv.	1 195	1 262	1 828	1 949	2 030	2 251	2 556	2 549	2 638	3 230
Other transport (2)	7 599	9 408	10 910	11 797	11 710	12 287	12 638	12 494	12 687	14 659
Total	15 426	18 164	21 475	22 589	22 319	24 594	25 370	24 180	24 345	27 916

(1) Road passenger transport, local and urban transport excluded
(2) Road freight, rail and inland waterway transport
Source: Eurostat

variably at the expense of railroads and inland shipping.

For those commodities where this has not been the case, coal, ores and oil, a shift from railroad to inland shipping has occurred.

The average EC inhabitant spent 15% of his net income on mobility.

The growth of passenger traffic is explained by demographic growth, increasing income and leisure, and by the integration of the goods and services markets of the Member States.

Growth in passenger traffic by train grew modestly compared to road and air traffic, whereas the latter grew fastest.

The growing use of advanced technology makes for a greater intermodal activity in the whole transport sector.

The ever increasing demand for high quality services has already led to combinations of transport modes.

The product is changing from transport between fixed points by way of one mode, to complete handling of the shipment from seller to buyer. In the framework of the complementarity of transport modes set up by the common transport policy, competition is expected to intensify between transport modes.

This is particulary true for competition between air and rail in passenger transport, (when high-speed rail networks increase and air fares fall) and between rail and road in freight transport. In some segments of the market cooperation between transport modes will intensify, for example in combined rail/road freight transport.

The rise of global courier services has also led to the usage of several transport modes within one company.

A further increase in the use of containers and roll-on/roll-off facilities will also stimulate multimodal transport.

Internal market

The free movement of persons and goods starts with the possibility of conveyance.

The EC transport market is mainly regulated on a national basis and therefore relatively fragmented.

There is no free access to the market nor are there equal conditions for competition.

In 1985 a ruling of the Court has obliged the Council to work out a common trans-

Table 3
Evolution of passenger transport in Europe, 1970-1988

(%)	Private Cars	Railways	Buses and Coaches
Belgique/België	81.7 (+7.3)	7.2 (-4.3)	11.1 (-3.1)
BR Deutschland	85.5 (+5.4)	6.4 (-2.4)	8.1 (-3.1)
France	82.9 (+2.1)	10.8 (-1.7)	6.3 (-0.4)
Italia	79.7 (+1.6)	7.4 (-3.6)	12.9 (+2.0)
Nederland	85.6 (+6.5)	6.2 (-2.6)	8.2 (-4.0)
United Kingdom	86.2 (+10.3)	6.3 (-2.5)	7.5 (-7.8)

Source: OEST-CEMT

port policy along the same liberal lines that hold for the rest of the economy under the rules of the EC. To this end the Council is committed to regulate within a reasonable period the liberalisation of intra-EC transport.

The Council will also establish the conditions under which entrepreneurs from one Member State are permitted to take part in transport in another Member State's national transport markets, under the same conditions as national operators (cabotage). The implementation of the common transport policy involves two broad elements:

- freedom to provide services and elimination of distortions of competition;
- improvement of infrastructure and production means.

Concerning the first element most progress is made on intra-EC road transport. Quantitative restrictions will be abolished entirely by 1992, and will be replaced by quantitative criteria governing access to the market. In the meantime, Community authorisations will be increased by 40% annually to the run up to 1993. Liberalisation of national transport markets largely held up the problem of cabotage. In the inland waterways sector cabotage is permitted to limited extent.

In the rail sector cabotage is actually not feasible, since the national railroad companies transfer their transport to one another at the frontiers.

As far as air transport is concerned, the Chicago Convention, which regulates air transport, gives countries the option to refuse cabotage. For road transport, since 1.7.1990 a limited system of 15000 cabotage authorisations valid for two month came into force.

It has to be stressed that the Commission has recently put forward several proposals, particulary for sea and air transport, with the aim of adapting the transport sector to the challenges of the 1990's.

Concerning the improvement of infrastructure and production means, the Commission has recognised the need of a "multimodal" approach, since the analysis of the impact of the internal market must take into account all the various transport modes at the same time.

Air transport This sector is characterised by an increase in traffic with an average annual growth of about 8%.

The main problems of the air transport sector is airspace congestion (which in turn creates security problems and delays of international flights) and the inadequacy of airport infrastructure. Progress has been made in the field of harmonisation and integration of air traffic control, whose coordination has been committed to Eurocontrol.

Moreover, the Council has recently approved the second phase of a package of measures for the liberalisation of the air transport sector.

Road transport This sector has undergone a strong development in the last two decades but this growth has not been supported by a parallel investment growth. According to the EC Council, during the period 1975-84 the GDP share assigned to investments in the transport sector decreased from 1.5% to 0.9% while the average annual growth rate of traffic has been 2.5%.

The EC policy in this sector aims at supporting projects to improve the road network (the Channel Tunnel, Scanlink) and financing road infrastructure of third countries (Switzerland, Austria and Yugoslavia) as far as they are essential to intra-EC traffic. Moreover, transport infrastructure in backward regions is promoted on the ground of regional economic considerations by the European Regional Development Fund.

Bus transport This particular mode of transport has to face the strong competition from private road traffic and lost substantial shares of the market in most EC countries (see table 3).

Urban transport Urban transport is currently the subject of great attention because of its contribution to solving the problem of congestioned urban centres.

New solutions have been envisaged throughout the Community to face the problem of financing urban transport, and high levels of investment have been planned to extend and adapt its structures to improve the quality of life in urban centres.

Rail transport Railways have suffered from competition from road haulage, private

cars and airplanes, the latter particularly over long distances. Figures provided by the European Conference of Ministries of transport (ECMT) show that railways' market share accounts nowadays for no more than 20% for total freight transport and less than 8% of passenger kilometres.

The Commission recently put forward a communication on a Common Railway Policy (better known as communication Van Miert-Bangemann) which envisages the installation of a railway system at European level which should progressively abolish the technical and administrative barriers of the present situation. High-speed rail network and combined railroad freight transport are the two axes for the future development of rail transport.

Combined transport Member States are unanimously willing to develop this transport mode which represents a solution to the problems of the transit through the Alps and traffic congestion on road networks. The Commission foresees a triple increase in the use of this particular mode of transport which currently represents 4% of total merchandise transport in the EC. A project to develop an international combined transport network is being considered, following a Council's decision of October 1990.

Inland waterway transport The existing European network is based mainly on the Rhine and involves five EC countries namely, the FRG, the Netherlands, Belgium, Luxembourg and the north-eastern regions of France.

This latter Member State has a wide network but its parts are badly connected with the main European network.

This is in turn linked with the seaports of northern Europe, and will be connected with the Danube in 1991.

Sea transport 30% of intra-EC trade and 90% of external trade of the Community passes through the seaports. Noticeable differences can still be found among the Member States concerning the organisation of ports and their financial structures.

Table 4
Energy consumption and emmission by mode of transport

	Air	Rail	Tram	Bus	Car
Gross energy consumption per vehicle-km (megajoules/km)	136	91	37	14	3
Gross energy consumption per passenger-km (million joules/km)	1.8	0.9	1.3	0.8	1.8
Emmissions in gram/km per vehicle-km					
CO	125	4.7	0.1	8.9	7.4
CO_2	11 000	6 625	2 644	979	215
others	60	36.4	11.1	26.5	4.0
Emmissions in gram/km per passenger-km					
CO	1.7	0.0	0.0	0.5	4.4
CO_2	150	64	92	56	127
others	0.78	0.31	0.39	1.57	2.41

Source:NEA

Application of telematics in transport sector: Several research programs like DRIVE (Dedicated Road Infrastructure for Vehicle Safety in Europe), IRIS (Integrated Safety Information and Navigation system) and EURET (Research and Technological Development Programme in the Field of Transport) have been carried out with the purpose of improving traffic safety and to integrate transport on an European basis.

Environment

The ecosystem and the quality of life are affected by transport in different ways: high energy consumption, air and acoustic pollution, road and airspace congestion, social costs determined by accidents. The growing concern for environmental issues has led to more attention on the contribution of each transport mode to pollution in general.

This is closely linked to energy consumption. Future transport services will have to overcome with stricter regulations on exhaust standards. This will also influence institutional preference for a certain transport mode. Table 4 gives a comparison between transport modes regarding energy consumption and exhaust emissions. In absolute figures, exhaust by private cars is the largest contributor to air pollution (with a factor over 500 times higher than other modes of transport).

This is mainly due to the intensive use of cars. Cars account for the majority of vehicle-km and passenger-km. Per vehicle-km airplanes are the heaviest users of energy and the major source of exhaust emissions. By passenger-km buses and cars are the major source. In both cases metro and tramway systems prove most friendly towards the environment.

Outlook

The transportation sector has witnessed exceptionally high growth rates during the last years. Growth is likely to continue, especially under the influence of the completion of the internal market.

Enhanced competition due to free market entry and limitation of unfair competitive conditions by national governments will lead to more customised services and higher quality.

This will not only strengthen the EC trans-

Table 5
Outlook for the transport sector

	1989	1990	91/90	92/91	94/89
Value added (bio ECU)	167	179	5%	6%	6%
Investments (bio ECU)	52	57	6%	8%	8%
Employees (1000's) (1)	4 527	4 581	1%	1%	2%

(1) Excluding Greece
Source: NEI

porters on the domestic and EC market but also on the global market.

The sector's growth in 1991 is likely to see a slight diminution due to the oil price rise. In addition, it will take some time for present infrastructural improvements to take effect. Congestion presently restrains high real growth. For some sectors like air transport, personnel problems also create a capacity limitation.

The need for productivity growth and infrastrucutral improvements explains the high investment rate.

It is likely that the full effects of a free internal transport market will give rise to a new hausse after 1991, leading to growth percentages up to 1994 which will surpass present trends.

Written by: NEI: Nederlands Economisch Instituut

Railways

After a general tendency towards stagnation - and, for some traffic, even regression during the 1980's, the EC railways are meeting the new decade with more confidence. Their main challenges are to reinforce the position of rail traffic on the international transport market, faced with increasing competition, reorganise the economic and judicial environment of companies in order to develop their autonomy and increase the railway's role as a solution to environmental problems, particularly in highly urbanised areas of Europe.
To achieve this, programmes have been launched with the aim of developing a proper system of high speed trains, as well as a network of combined transport on a European scale. Other moves involving solidarity and co-operation between companies are being studied.

Definition of the sector

The railway sector comprises units which are only concerned with transporting passengers and freight by rail. This sector also covers equipment and supplies for numerous activities, including the private railway sector. Not included are: (a) railways which only serve one town (721.1); (b) repair workshops for locomotives, carriages and wagons (362.3); (c) local railway units which operate regular bus services (721.2); (d) sleeping cars and restaurant cars (666).

Current situation

The European Community's railways provide an almost continuous network of some 122,000 kilometres of lines, and over 130,000 kilometres if one counts the federal railways of Austria and Switzerland which joined the Twelve's national companies within the CCFE (European Railway Community). The European scale of this group is now proving itself with the installation or planning of "Missing links" which traditionally divided the European railway system into compartments: the tunnel under the Channel due to be operational in 1993, construction of a fixed line on the Grand Belt in Denmark, also in service in 1993, building of high speed lines to the international loading gauge in Spain, and a Swiss decision, important to the EC in time, to investigate two primary tunnels for the new Alpine link.

Production

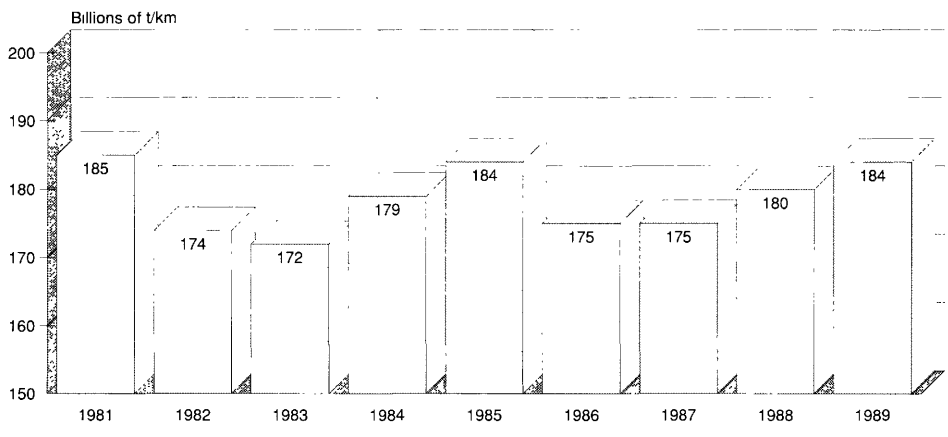
Table 2 and Figure 1 show the development of freight traffic on the networks on the European Community expressed in tonnes/kilometres. It is clear that, following a significant decline in transport funds be-

Table 1
Railways
Network and line distance

	Network	Line distance in kilometers		Lines %
		1987	1988	1988
Belgique/België	SCNB/NMBS	3 568	3 554	63.7
Danemark	DSB	2 476	2 476	9.3
BR Deutschland	DB	27 421	27 278	42.8
Hellas	CH	1 565	1 565	0
España	RENFE	12 667	12 531	50.4
France	SCNF	34 448	34 365	34.9
Ireland	CIE	1 944	1 944	1.9
Italia	FS	15 983	16 015	58.1
Luxembourg	CFL	270	272	59.6
Nederland	NS	2 809	2 828	69.2
Portugal	CP	2 850	2 850	16.2
United Kingdom	BR	16 630	16 599	26.4
EC 12		122 631	122 277	(1) 39.3

(1) Excluding Greece
Source: UIC, Paris

Figure 1
Rail freight traffic evolution in the European Community networks



Source: NEI

tween 1982 and 1987, results recorded at the end of the decade show the future in a more optimistic light. On the other hand, it is important to note that the gross results expressed in tonnes/kilometres hide a structural modification of traffic: the proportion of heavy products with low added value is declining whereas the transport of goods with higher added value is increasing, the latter most often being carried on full trains or combined trains, offering speed and reliability over long distances.

In total, the networks of the European Community Member States produced, in 1989, 183.7 billion tonnes/kilometres, i.e. an improvement of 2.4% over 1988. With the Swiss and Austrian railways also belonging to the European Railway Community, the overall results exceed 200 billions of tonnes/kilometres. Nearly 40% of these services have been international.

Particularly good progress was made in 1989 by the Luxembourg (10.1%), the Italian (6%), the Belgian (4.9%) and the German (3.6%) railways.

As regards passenger traffic, the level of activity which was generally stable for ten

Table 2
European Community network
rail freight traffic

(millions tonnes/ kilometres)	Networks	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Belgique/België	SNCB/NMBS	8 037	7 561	6 818	6 896	7 929	9 397	8 524	8 372	8 838	9 275
Danemark	DSB	1 619	1 476	1 652	1 627	1 635	1 749	1 791	1 680	1 657	1 686
BR Deutschland	DB	63 765	61 037	56 511	55 059	58 886	62 911	59 581	58 047	58 972	61 109
Hellas	CH	814	693	586	670	770	733	702	599	604	600
España	RENFE	10 528	10 267	10 193	10 210	11 353	14 546	13 994	13 884	14 052	14 000
France	SNCF	68 815	63 730	60 554	58 756	59 502	55 121	51 016	50 600	51 527	52 449
Ireland	CIE	637	691	671	582	601	601	574	563	545	560
Italie	FS	18 384	17 115	16 904	16 716	17 871	17 963	17 476	18 626	19 663	20 850
Luxembourg	CFL	664	585	551	503	583	600	543	588	635	699
Nederland	NS	3 468	3 319	2 887	2 835	3 157	3 269	3 107	2 995	3 200	3 108
Portugal	CP	1 001	1 003	1 060	1 044	1 239	1 306	1 448	1 614	1 708	1 718
United Kingdom	BR + NIR	17 640	17 505	15 879	17 144	15 842	16 047	16 565	17 466	18 104	17 679
EC 12	Total	195 372	184 982	174 266	172 072	179 368	184 243	175 321	175 034	179 506	183 735

Source: UIC, Paris

Table 3
European Community network
rail passenger traffic 1980-1989

(in millions of passengers/kilometres)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
SNCB/NMBS	6 963	7 078	6 879	6 631	6 444	6 572	6 069	6 270	6 348	6 400
DSB	3 353	4 003	4 215	4 391	4 421	4 508	4 536	4 782	4 797	4 796
DB	40 499	41 795	40 030	38 755	39 075	42 707	41 397	39 174	40 959	41 144
CH	1 464	1 515	1 501	1 629	1 652	1 732	1 950	1 973	1 963	1 970
RENFE	13 527	14 261	14 703	15 092	15 571	15 979	15 646	15 394	15 716	14 715
SNCF	54 260	55 414	56 605	58 177	59 953	61 640	59 618	59 732	63 057	64 260
CIE	1 032	995	887	846	903	1 023	1 075	1 196	1 180	1 221
FS	39 587	40 090	40 019	37 150	37 127	39 265	40 500	41 395	43 343	44 442
CFL	246	252	251	239	231	229	224	216	223	224
NS	8 892	9 177	9 255	8 886	8 790	9 007	8 919	9 396	9 664	10 170
CP	6 077	5 856	5 414	5 195	5 456	5 725	5 803	5 907	6 036	6 084
BR + NIR	31 704	30 740	27 360	30 100	29 777	30 256	30 819	33 140	34 315	33 270
EC 12	207 604	211 176	207 119	207 091	209 403	218 643	216 556	218 575	227 601	228 696

Source: UIC, Paris

years, then showed a modest rise in 1989. The EC-12 railway companies carried a total traffic of 228.7 billion passenger/kilometres, i.e. an improvement of 0.5% over 1988. Including Switzerland and Austria, traffic reached 247.8 billion passengers/kilometres and the increase was 0.5%. The most progress was made by the Dutch railways (5.2%), the Irish (3.5%) and the French (around 2%). These results can be explained particularly by a commercial network policy giving preference to diversification of services run in terms of market sectors and innovation regarding quality or fare structures. The launching of high speed services and the development of international products are other factors contributing to market stimulus.

Technological developments

Progress achieved in the field of railway technology has chiefly been in improved performance of trains and better operation. In France, the German Federal Republic, the United Kingdom, Spain and Italy, ambitious development programmes for high speed trains are being undertaken or planned. On several networks, improvements are also expected from the introduction, on lines in uneven areas, of oscillating-body rolling stock. In France and the German Federal Republic, freight wagons travel at 160 km/h and experiments have been carried out at 200 km/h.

Furthermore, innovations have been applied to combined transport techniques, in particular the introduction of "bimodal" techniques. Railway safety also depends on the quality of rail infrastructure and the reliability of the signalling and traffic management installations.

Computerisation plays an irreplaceable role in this respect.

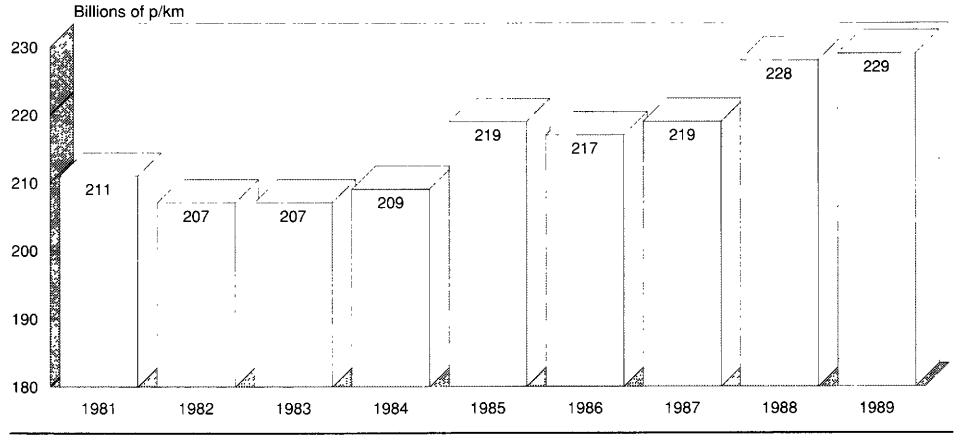
On an EC scale, companies are continuing with the development of their computerised international date exchange network, Hermes, which is used for both commercial applications and for optimising international traffic.

Two major community projects are linked to this network development:"Docimel" i.e. the electronic exchange of information of freight despatches between senders, railways and Customs and the project for Computer Aided Production Management (CAPM) to interconnect national traffic management systems.

In the latter case, it is a question of optimising international freight traffic controls.

In another research field, experts have started to study, looking towards future

Figure 2
Rail passenger traffic evolution
in the European Community networks



Source: NEI

railway traffic, the operating and technical requirements of a unified monitoring/controlling system at EC level.

High speed

With the entirely new prospects linked to a spectacular reduction in journey time, high speed links are, one of the major development themes in the railway of the future. Thus, at the start of 1989, the European Railway Community presented to the European Community authorities a plan for the establishment of the future European network of high speed trains. This plan provides for a 30,000 km network combining, at the start of the next century, new and refitted lines, and link lines. This network should, within each country, connect up with traditional and regional rail links. Moreover, the recent developments in Eastern Europe have given rise to preliminary studies on extending this planned network towards certain Eastern destinations.

The total investment has been estimated at 90 billion ECU, 15 of which have already been allocated. Most of the finance is expected to come from the private sector, with the EC only intervening for link line problems (e.g. in the mountainous areas of Greece). A high level working party has been set up to coordinate the creation of a high speed European transport network.

The movement towards high speed has recently been confirmed in numerous decisions drawn up by government or railway authorities. In France, following the Atlantic TGV which entered into commercial service and which during tests established a new world speed record on rails of 515.3 km/h in May 1990, a major project for TGV was presented by the government. This plan foresees that around 2000/2010 in France, about 11,000 km will be covered by the TGV, of which 4,500 will be new lines. Interconnections with most neighbouring countries are foreseen. Hub of the future high speed European network, the Paris-Brussels-Amsterdam/Cologne-Frankfurt link, has already a construction timetable: 1993 for the Paris-Lille tunnel, 1995 for Lille-Brussels, 1998 for Brussels-Cologne and Brussels-Antwerp-Rotterdam-Amsterdam. Furthermore, in view of the opening of the Channel tunnel in 1993, an order for international high speed trains was signed at the end of 1989 by the Chairmen of British Rail, SNCF, and SNCV on the one hand, and the Directors of a European industrial consortium on the other hand. This joint order covers 30 TransManche trains capable of operating at 300 km/h. Whilst in Germany Inter-City Express (ICE) trains should be in commercial service in May 1991, Spanish railways are working on a high speed Madrid-Seville link with an international gauge and are studying a second Madrid-Barcelona line. In Italy, a new "high speed" plan is being studied.

Passengers

High speed is not the only development theme for EC railways. Companies are also refining global concepts within which various types of traffic have their place; high speed, traditional, regional, night traffic. The networks' commercial activities are aimed at all the expanding market sectors: business travel, leisure and tourist trips. Considerable effort is being put into improving quality, whether it is of EuroCity international services - 10 new trains in 1989 - or domestic links such as Inter-City in the majority of European countries. Various methods are the object of experiment for on-train catering. Telephone and office facilities have been introduced by several companies. With regard to night services, a strategy has been defined in 1988 at international level to relaunch this type of traffic, taking account of different comfort levels. One of the categories covers "hotel-trains" with high-level comfort and prototypes should be running as of 1992. Innovations are also under way in fare structures. The application, from 1990, of a new European reference pricing system should render international fare structure calculations and computerised ticket sales easier. This system enables prices to be expressed in ECU, including those for several Eastern European countries. In parallel with the fare structures offered to national and European customers, the railways of the 18 EC and EFTA countries launched in May 1980 EuroDomino - an offer enabling travel in several chosen countries by purchasing passes - within the framework of the European Tourism Year. Another major evolution is the railways' quest to improve the sales distribution system of their services by interconnecting their computerised sales network with those of other sales networks such as airline companies.

Freight

In order to re-establish freight traffic, various steps have been taken: raising the speeds between the main European economic centres, shipping reliability including the notion of Just-In-Time, attractive fare structures. At international level, a global freight traffic strategy has been established. This focuses on improving quality and reducing production costs, cross-bor-

Table 4
Railways
Average manning levels by network 1980-89

	Network	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Belgique/België	SCNB/NMBS	65 652	67 533	66 346	63 660	60 933	57 964	55 193	52 848	49 701	46 705
Danmark	DSB	22 110	22 726	22 832	22 541	22 154	21 635	21 437	21 736	21 794	21 113
BR Deutschland	DB	328 980	324 871	317 475	307 246	295 554	283 356	272 790	262 414	251 344	242 354
Hellas	CH	12 140	12 118	13 118	13 026	13 416	15 048	14 596	14 525	14 209	14 000
España	RENFE	71 547	71 787	73 498	75 322	72 076	66 440	66 509	60 745	52 961	50 184
France	SCNF	254 200	248 497	252 421	252 200	248 349	242 091	233 404	222 426	213 244	206 400
Ireland	CIE	18 052	18 040	17 809	16 930	16 285	15 628	15 000	14 016	12 845	11 922
Italia	FS	220 655	224 536	223 686	223 939	220 593	216 128	214 947	215 571	214 298	208 529
Luxembourg	CFL	4 216	4 158	4 031	3 928	3 827	3 800	3 785	3 710	3 658	3 589
Nederland	NS	26 876	27 783	27 626	27 236	26 650	26 839	27 474	27 381	26 591	26 207
Portugal	CP	24 704	23 994	23 504	23 360	22 388	21 749	21 433	21 257	22 064	22 056
United Kingdom	BR	241 882	234 205	220 370	207 097	190 046	178 420	171 400	161 188	149 900	134 000
EC 12		1 291 014	1 280 248	1 262 716	1 236 485	1 192 271	1 183 298	1 117 968	1 077 817	1 032 579	987 059

Source: UIC, Paris

der cooperation, logistical services, co-operation with highways for combined transport, the improvement of sales structures. Arising from this global strategy, two other strategies, one for combined transport products, the other for full wagon products - between 38% and 75% of the networks' freight activity - have been worked out. For full wagons, the networks' effort should concentrate on geographic or sector markets where railways have solid advantages in relation to the competition. The first step in setting up a European network of fast and reliable trains for full loads, the EurailCargo label, first appeared in May 1990. This is only assigned to freight services which meet strict quality and punctuality criteria.
A new form of commercial cooperation between the European railways started with the setting up of Communities of interest - the first, responsible for selling the transport of new cars, was formed in 1989. Moreover, considerable benefits are expected from the "Docimel" and CAPM" projects relating to the tracking of international transport movements.

Combined transport

Combining the techniques of detached containers and road vehicles onto a railway wagon, as well as "bimodal" techniques, combined transport, together with high speed, is the other essential theme in European railway development. In 1993 the volume of combined transport over Europe is expected to double. The congestion problem on the major transport routes and, more recently, the prospect of increasing trade with Eastern Europe should further stimulate this transport technique. The consultant A.T. Kearney carried out a major study co-financed by the European Railway Community and the European Commission on the future European network of combined transport. This study identifies the 30 main themes to be considered in international combined transport and evaluates the investment required, particularly for nerve centres and terminals. Combined transport, and especially road/rail, is considered by the governments in those countries with a high level of transit road traffic - Switzerland and Austria - as the most efficient remedy for environmental risks. Major decisions have been taken on policy in these countries to encourage road/rail transport for transit traffic.

Employment

Table 4 shows average manning levels on the European Community country networks. Under the effects of rationalisation and productivity improvement measures, average manning has continued to decrease. In 1988, the EC-12 national railway companies employed in total 1.03 million people. In 1989, total manpower was 987,000 people.
The trend observed should continue over the years to come, due to the reforms planned, both at company management level and at that of railway operation.
The Community average for personnel costs is about 60% of all operating expenses.
There are sizeable variations between different Member States: Luxembourg and Belgian railways see respectively 80 and 74% of their operating costs devoted to labour costs. However, for Spanish and Danish railways, this percentage is about 45 and 49% respectively.

Finance

Cooperation between European railways has been further simplified with the introduction, at the beginning of 1990, of the ECU as a means of remuneration and pay-

ment between railway companies as a replacement for the Franc-UIC.

This step is not limited to European Community networks and also covers several Eastern European railways. Going even further, the networks are studying the possibility of introducing, as early as 1992, the ECU as the unit of currency for all fields of international railways cooperation.

With regard to the financial situation of the railways, it must be underlined that their activities are not purely commercial, but also play a considerable role at social, cultural and regional policy levels. National authorities often wish to offer a railway service to regions of low population, even if the activity does not produce profits. However, the financial situation of certain networks is cause for concern (refer to Table 5): amongst other things this is the consequence of monopoly situations within different Member States in the Community.

The monopolies own the railway infrastructures and have the exclusive use of them: this leads to high costs and creates obstacles to the development of cross-border services.

The Commission has understood the nature of the problem and has recently proposed a "Common railway policy document" (better known under the name of the Van Miert-Bangemann document). The main aim of the document is to set up a railway transport system at Community level. On the financial front, the Commission advocates commercial autonomy, independent company management and the creation of adequate financial resources. In particular, the Commission has suggested that railways maintain control of their infrastructures, whilst access to the latter should be widened to private enterprise which would pay for this right.

Subsidies by Member States

Under Community law, drawn up from the joint declaration of 13th May 1965 (65/27/EC), Member States offer financial assistance to railways with the aim of freeing them from Community financing. Financial aid could be offered for various reasons: compensation for services offered in the field of public service (69/191/EC); unequal competition, in particular with regard to social benefits offered to railway employees (69/1192/EC); compensation for infrastructure costs borne by railways as opposed to other transport systems (10/1107/EC and Council Decision 75/327/EC on stabilising railway finances).

The amounts contributed by Member States to railways are shown in Table 5. Member States' contributions, including capital allocations, are an important financial source because of the services rendered to their country by the railways.

Table 5 shows that in Luxembourg, Italy, Belgium and Spain subsidies paid represent more than half of total receipts.

On the contrary, in the United Kingdom, Ireland and France subsidies do not exceed more than 30% of total receipts.

Environment and safety

The train offers advantages from the point of view of the environment, particularly in the field of atmospheric pollution.

Electric traction allows for energy source diversification and changes to less-polluting primary energy. Increasing European road and motorway congestion could reveal itself as an advantage for railways over the coming years.

From another point, the train is one of the safest forms of transport.

Table 5
Financial situation of the EC railways, 1988

(millions ECU)		Total receipts	Subsidies as % of total receipts	Profits or losses of the balance sheet (1)	personnel costs
Belgique/België	SNCB/NMBS	2 290	53.0	-108	74.2
Danemark	DSB	1 085	37.3	0	49.3
BR Deutschland	DB	14 033	33.1	-1900	61.8
Hellas	CH	117	32.6	-137	66.5
España	RENFE	2 410	51.8	-101	44.9
France	SNCF	10 229	28.2	-670	54.4
Ireland	CIE	255	25.2	+2	56.6
Italia	FS	10 617	68.5	-1274	52.4
Luxembourg	CFL	202	75.1	-5	80.4
Nederland	NS	1 415	43.2	50	57.0
Portugal	CP	261	34.7	-67	59.3
United Kingdom	BR	2 563	15.0	+202	59.5

(1) Excludes exceptional profits and losses and corporation tax
Source: Communauté des chemins de fer européennes

The socio-economic cost of road accidents is estimated at 75 billion ECU per annum, for all EC Member States and Austria and Switzerland. It has been shown that the total amount of this cost is equal to the sum of funds allocated by governments to railways. Finally, combined transport also helps in the reduction of atmospheric pollution.

Outlook

For the new decade, railway development is characterised by major projects such as high speed trains and the extension of Community infrastructure.

Present congestion problems in air and road transport and the additional costs generated by this, in the medium term should be of benefit to railways.

Table 6
Railways
Forecasts 1990-94

EC 12	1989	1990	1991	1992	91/90	92/91	94/93
Rail freight traffic (billions of tonnes/kilometres)	184	188	192	196	2.0%	2.0%	2.3%
Rail passenger traffic (billions of passengers/kilometres)	229	231	234	238	2.0%	2.0%	1.5%
Employment (thousands of people)	987	948	929	919	-2.0%	-1.0%	0.0%

Source: NEI

Thus growth of around 2% per annum is forecast for the five years to come.

Furthermore, growing awareness of aviation problems and road safety should also act in favour of the railway sector if the latter shows itself capable of meeting these new challenges, notably by continuing to modernise this sector.

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Regional and local bus transport

Local and regional bus services are organised on a franchise basis in most EC countries. The EC has no official public transport policy. Public transport is viewed as a matter of local government, following the principle of subsidiarity. Licensing is usually the responsibility of local authorities. In some countries private companies operate next to public companies. Competitive conditions are hindered by planning of operations which leaves little or no room for overlaps.

Sector definition

NACE 721.2 includes units exclusively or primarily engaged in the operation of city, suburban and intercity tramway, trolley bus and motor coach services in so far as they are operated as regular or special regular services.

Regular services provide regular transport of passengers on scheduled routes which follow a fixed timetable. Special regular services cater for specific categories of persons to the exclusion of other passengers (e.g. workers, school children, airline passengers).

Current situation

Bus service is by far the most widespread mode in urban and suburban public transport in the EC. Buses account for 60% of passenger trips, with 59% of the total vehicle fleet and about 90% of the public transport network systems.

Table 1 shows the main characteristics for regional and local bus transport for the major EC cities in 1988.

Paris, Athens, Rome, London and Copenhagen have the largest operating systems in terms of route length and number of routes. It must be noted however, that these cities have considerably shorter passenger journeys than the average passenger journey length.

Staff is clearly related to the supply of services. However, productivity varies considerably between the different networks. Amsterdam shows a relatively low productivity of some 8300 vehicle-km per employee. Copenhagen on the other hand manages a relatively high productivity of about 17000 vehicle-km per employee. Other networks take intermediate positions. It must be stressed though that this productivity indicator is very sensitive to network characteristics such as the average distance between stops and the length of lines.

Although sensitive to network features another productivity measure could be the average vehicle-km per bus.

Luxembourg scores relatively low with about 24000 km per bus.

Copenhagen shows a very high productivity with some 78000 km per bus. Athens buses are also relatively productive at 65000 km per bus.

Table 1
Main characteristics local bus transport by city, 1988

Country	City	Vehicle km (million)	Passenger journeys (million)	Staff	Fleet	Route length (km)	No. of routes
Belgique/België	Antwerp (MIVA)	7	19	N/A	132	236	22
	Brussels (STIB)	(1) 19	57	2 037	526	276	36
	Brussels (SNCV)	20	32	650	290	690	43
	Charleroi (STIC)	4	11	354	90	109	22
	Charleroi (SNCV)	(1) 7	10(3)	N/A	72	N/A	N/A
Danmark	Copenhagen (HT)	85	140	5 000	1 088	4 400	252
France	Lyon (TCL)	32	N/A	N/A	763	N/A	72
	Marseille (RTM)	21	(1) 90	N/A	538	590	64
	Paris (RATP)	141	812	15 371	3 925	2 493	208
BR Deutschland	Berlin (W) (BVG)	64	335	4 328	1 300	1 015	85
	Bonn (SWB/SSB)	11	(3) 25	583	182	438	32
	Frankfurt (SF)	12	(1) 31	N/A	209	268	40
	Frankfurt (DB)	(1) 7	(1) 12	N/A	125	445	22
	Frankfurt (FKE)	(1) 1	(1) 2	N/A	67	311	18
	Hamburg (HHA)	56	194	2 350	717	1 388	120
	Hamburg (VHH)	16	32	864	N/A	1 290	64
	Hamburg (PVG)	1	5	350	106	59	7
	Hamburg (KVG)	1	(1) 1	N/A	28	N/A	N/A
	Munchen (SM)	30	166	N/A	353	409	75
Hellas	Athens (EAS)	116	514	9 450	1 767	4 215	330
	Athens (ILPAP)	(1) 1	1	N/A	8	27	2
	Athens (ISAP)	4	20	N/A	N/A	N/A	N/A
Ireland	Dublin	46	163	3 832	809	845	130
Italia	Milan (ATM) urb.	32	286	N/A	1 528	342	58
	Milan (ATM) sub.	19	54	N/A	incl	591	38
	Naples (ATAN)	N/A	N/A	N/A	728	520	142
	Naples (CTP)	N/A	N/A	N/A	N/A	N/A	N/A
	Rome (ATAC)	120	777	12 855	2 806	2 019	228
	Rome (ACOTRAL)	N/A	100	N/A	1 762	N/A	N/A
Luxembourg	Luxembourg	3	12	396	124	N/A	23
Nederland	Amsterdam (GVBA)	(2) 18	58	2 161	368	405	47
	Rotterdam (RET)	16	43	N/A	265	310	27
Portugal	Lisboa (Carris)	46	424	4 818	806	562	91
	Lisboa (RN)	(3) 25	(3) 144	2 448	648	N/A	N/A
	Lisboa (TCB)	N/A	N/A	324	71	N/A	N/A
España	Barcelona	38	215	2 976	824	749	89
	Madrid (EMT)	(1) 83	(1) 469	6 984	1 485	2 206	140
United Kingdom	Birmingham (West M.)	(2) 111	(2) 415	N/A	1 873	5 000	400
	Liverpool (Mersey)	53	178	3 242	1 086	651	110
	Liverpool (North W.)	(1) 18	(1) 50	1300	479	N/A	120
	London	245	1105	19 600	5 113	2 920	426
	Manchester (GM)	(3) 114	(2) 350	6 000	1 869	2 376	800

(1) 1987
(2) 1986
(3) Estimate
Source: Jane's 1990

The number of passenger journeys is an indicator of demand (although passenger-kilometers would be more suitable). Largest demand can be identified in the large European conurbations of Paris, Athens, Rome and London.

British cities stand out because of the large numbers of fleets and routes and the high route length. This is the result of deregulation and the fact that there was already a large coach sector.

Cost structure

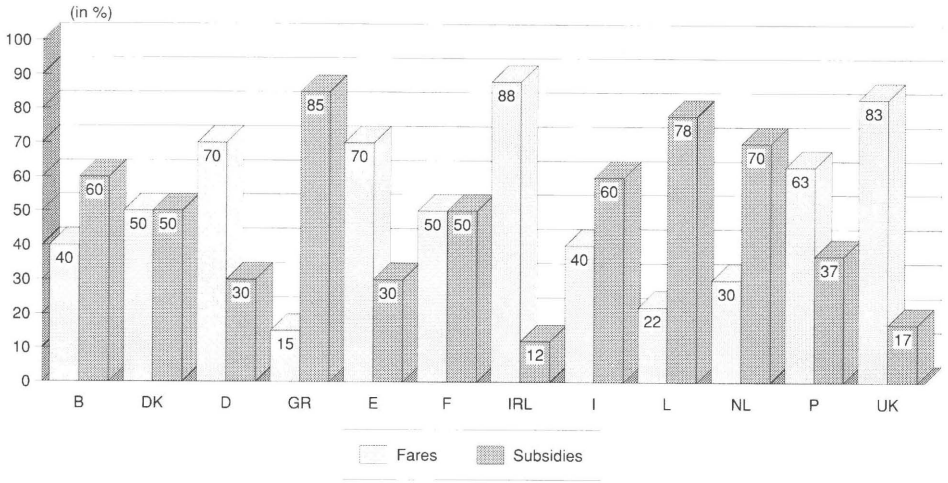
Figure 1 gives the division of financing by means of subsidies and fares by country. Due to differences in structure of operations and forms of financing the figures for the different countries are not always strictly comparable. In general it can be said that local bus operations tend to have lower fare revenues.

In Ireland revenues cover 83% of costs for Dublin Bus and 96% for Bus Eireann. For Greece only data on bus transport in Athens is known, where 85% of operational costs are financed through subsidies. The cost-covering ratio from fares for Belgian public bus transport was around 30% to 40% for the urban bus companies and between 25% and 55% for the various regional sub-units of the national bus company. The Danish revenues for the system are shared between the transport company, the State Railways and the pri-

vate railways, and the deficit of the public transport company (about 50% of its costs) is recovered from contributions by the municipalities.

In Germany the proportion of costs covered by ticket sales varies between about 60% for the urban operators and 80% for the regional operators. In Spain revenue to cost ratios for medium-sized towns vary between 60% and 90%; in Madrid and Barcelona they are lower. France has created a special taxation measure for public transport support: the "versement transport", which is charged to all business establishments with more than nine employees in areas with a population of more than 30,000. In other French cities municipal operations are financed by fares for about 50%, by "versement transport" for another 30% and the remaining 20% coming from other local sources. In Italy only 50% of the total costs (including investment expenditures) are met by fare revenues; financing of the deficit is shared between the region and the municipality. In the Netherlands about 25% of the costs of urban public transportation companies and 40% of the costs of regional companies are covered by ticket revenues.

Figure 1
Financing of bus operations in the EC, 1988 (1)



(1) Estimated
Source: NEI

Regulatory environment

Belgium In 1989 responsibility for public transportation by bus was federalised and transferred to the three regional governments of Flanders, Brussels and Wallonia. The national bus company and the urban public transport companies will be reorganised into quasi-commercial regional companies, which will be owned by the region. Five local subsidiaries will be created, which are allowed to operate under "contrats de gestion" for four to six years. Such a contract gives monopoly powers for the area. Fare determination is done by the regional public transport company. It will also decide on the allocation of subsidies to the operating companies. Furthermore it will coordinate certain activities such as common ordering of vehicles, promotion of a common statute for personnel, common services between operating companies, etc.. The operating companies will determine timetables and can decide to sub-contract their operations.

Denmark In most Danish county councils, regional transport companies have been created in order to manage all regular public transport operations within the area.

In general these companies organise, plan and market the services offered. For the operations they generally license services to a variety of (mostly private) companies. Revenues go to the regional transport company while deficits are financed by the local authority.

In the Capital Region (Copenhagen and surrounding counties) the situation is different. Public transportation in this region is governed under a new law, which came into force the 1st January 1990. This law engages the Capital Region Public Transport Company in general transport planning, the preservation of the network and the integration of fare structures with those of the railway companies.

It has to licence-out about 45% of all bus services in long term contracts by 1st April 1994. These licences must be arranged by way of a competitive tender procedure. The first 20% was put out for tender by 1st April 1990.

Germany The market for local and regional bus transportation in Germany is restricted in terms of administrative control and coordination.

The local and regional authorities take responsibility for public transportation. They determine routes and fare systems and they decide on licensing certain services to private companies. They usually control municipally owned operators and public utility companies active in this field. In practice these companies cooperate extensively with each other.

Competition between bus and railway has always been strictly avoided. The Deutsche Bundesbahn itself operates a large number of rural bus services through its subsidiary Geschäftsbereich Bahnbus

(GBB). Many lines are replacements of rail services. GBB has recently been split into 25 regional companies.

Spain Spanish authorities grant franchises for the operation of a network of scheduled services. The franchise is granted for a minimum of eight or a maximum of 20 years. The authorities, usually the municipal council, determine route structures and fares. Non-scheduled services, such as school and charter services are provided by different companies.

These services are not allowed to compete with scheduled services.

The industry consists of 185 companies for urban transport, of which 28 are municipally owned and three are labour cooperatives. The remainder is privately owned. Private companies operate in 129 of the 134 small sized towns (population below 100,000). In four out of the five large cities (population over half a million) the municipalities take charge of public transport themselves.

France Regional bus transport is the responsibility of the "départments".

Bus services outside urban areas are secured through monopoly franchise contracts. There is strong administrative co-ordination of services and no direct competition. Public transport within the "périmètre d'agglomération" of urban areas is controlled by an Autorité Organisatrice (AO). The AO normally enters into a single area monopoly contract, within which it determines service structures and fare levels. The contract may be between five and nine years. Three major groupings (Transexel, Transcet and CGFTE) control most of the market. In the long distance market the national rail company is protected against bus competition.

Greece Greek regional and local bus transportation is governed by the Prefectures. By law the Prefectures have to grant public transport licences to the cooperative association in the region. Each region has its own association. The transport operations are run by private companies, which have been contracted by the association.

In Athens the situation is different: two government owned bus companies run the public transportation services in this city.

Ireland Local bus transportation in Ireland is governed by a licensing system. In practice however, two subsidiaries of the partially state-owned CIE undertake bus services within an effective monopoly. In the capital Dublin Bus provides for all bus services within the city. In other cities and in rural areas Bus Eireann runs the services. Applications for licenses by private companies are usually opposed by the CIE.

However, in the market for inter-urban transport about 40 private operators do compete with Bus Eireann. In some cases operators appear not to require a license.

Italy Regional and local bus transport in Italy is operating under a franchising system. Regional authorities take charge of licensing franchises for specific areas. Franchises are granted for long durations under monopoly conditions.

In larger cities the franchise is usually granted to the public transport company, which is generally municipally owned. Franchises for rural areas can be granted to any operator, either privately owned or publicly owned. For longer-distance services the regional authority also provides a franchise. However, in these franchises there could be overlaps with other services.

The Netherlands All public transport services in the Netherlands are governed by a licensing system under the Passenger Transport Act. In practice however, regular public transport is a fully monopolised system. Government policy is such that there is little or no competition with the railways.

In urban transportation the municipality issues licenses. In the Netherlands there exist nine urban transport operators all owned by the respective municipality in the largest cities of the country.

Regional (inter-urban) transportation is governed by the Ministry of Transport. There are 16 regional bus companies, which are all 80% subsidiaries of a state-owned holding company since 1982. The regional bus companies provide local bus services in 45 larger municipalities, which also control the operations of the companies.

Portugal The regime makes a distinction between public transport in metropolitan areas and in the rest of the country.

In metropolitan areas (Lisbon and Oporto) commissions control the establishment and implementation of a public transport plan. Their task is to design procedures for regulating the public transport system. The operators are currently state owned, but there are plans to transfer ownership to the municipalities.

In the rest of the country the government strives for complete deregulation to the extent that only qualitative restrictions are imposed. This is done by way of a qualitative licensing system for operators. The government wants to retain control over maximum fares. Further, the government intends to authorize municipalities to supplement the network with subsidised services.

United Kingdom The British government highly favored the privatisation of public services and utilities.

In this respect the National Bus Company (England and Wales) and the Scottish Bus Group (Scotland) were privatised in 1985. The National Bus Company was split into 71 separate companies. The general objective of privatisation was to create smaller entities out of large passenger transport operators. These entities would be able to compete with each other by way of pricing and services. The deregulation seems to have led to higher efficiency and quality, although this has not resulted in more services for the consumer.

Internal market

The EC has no official public transport policy. Public transport is considered a matter of national government. There are however a number of relevant measures that work towards more competitive systems of public transportation immediately affecting regional and local bus transport. Member States are no longer allowed to discriminate in public procurement. Technical standards are harmonised and these apply also to materials and infrastructure of public bus transport.

Border-crossing public bus transport is very limited, being less than one percent of the total market.

Outlook

Although deregulation is well underway in some countries, in most cases there is still a large difference between deregulation and an open and competitive market. Only the UK, Denmark and Portugal appear to have a significant degree of competition. In the other countries the indication of excessively high fixed costs does not lead to complete deregulation. This is due to the fact that public transport is seen primarily as an element in a locally planned social infrastructure which requires direct political control, and the fact that local transport policy is used as an instrument for the achievement of broader goals.

Written by: NEI: Nederlands Economisch Instituut
Based on: Prof. K.M. Gwilliam and D.J. van der Velde, The potential for regulatory change in European Bus Markets, in: The Journal of Transport Economics and Policy, september 1990, p. 333-350

Road passenger transport

While transport by private car has grown faster than the overall passenger mobility, growth rates for road passenger transport have been moderate. However, the future prospects for this sector are favourable. Car transport will become more discouraged by governments, as a result of the growing interest in environmental issues and growing congestion problems. Intensifying competition can be expected as high-speed train networks are increasing in number and use. The European integration will also be a stimulating factor particularly for international passenger movements. The EC Commission has already made proposals with the aim of liberalising road passenger transport within the Community.

Sector definition

The road passenger transport sector includes units exclusively or primarily engaged in the operation of taxi-cabs, chauffeur driven hire cars, regular and occasional motor coach services, etc. Apart from public transport services, a large part of the industry consists of coach services for tourism.

Current situation

In table 1 the growing importance of private transport is shown. It's share of total inland passenger transport for a number of EC-Member States has increased during the period 1984-1988. The fall in motor fuel price was a major contributing factor to this, but also the favourable economic developments in the EC inevitably stimulated the sale and use of private cars. Considering public transport (including regular services) in shares of total passenger transport for the countries shown, Spain is the only country in which the public modes of passenger transport gained some market share. Compared to the other countries this percentage of nearly 20% is high, whereas the Netherlands and the UK percentage is relatively low with shares of 7.2% and 7.7% respectively. In all countries rail transport shows a share of 6% to 9% taking a minor share in public transport.

Table 1 presents figures for both buses and coaches for occasional services and regular services. In table 2 the share of buses and coaches in passenger transport is indicated. This reveals a share which varies between 8% for the Netherlands and 22% for Italy. Other countries take intermediate positions. During the period

Table 1
Modal split of passenger transport - public transport, private transport, rail, 1984-1988

(in %)	1984 Public	1984 Private	1984 Rail	1988 Public	1988 Private	1988 Rail
Danmark	15.3	76.5	8.2	14.0	79.0	7.0
BR Deutschland	11.8	81.5	6.7	10.0	83.2	6.8
España	18.8	71.8	9.4	19.2	72.2	8.6
Nederland	7.7	86.5	5.8	7.2	87.1	5.7
Portugal (1)	12.6	78.9	8.5	12.6	78.8	8.6
United Kingdom (2)	8.5	84.4	7.1	7.7	85.0	7.3

(1) 1986
(2) Great Britain only
Source: International Road Federation, World Road Statistics,1989

1975-1985 the most remarkable growth in transport by buses and coaches has been observed in Italy; this fact can be partly explained by the low degree of efficiency of rail transport in this country.

Table 2
Modal split of passenger transport - train, car and bus: the share of buses and coaches, 1985 (1)

	Share %	variation 1975-1985 %
Belgique/België	11	-8
Danmark	15	66
BR Deutschland	11	-9
España	19	15
France (2)	9	77
Italia	22	107
Nederland (3)	8	16
Portugal	12	N/A
United Kingdom	9	-24

(1) Calculated on passengers-km
(2) Public and private bus transport
(3) National vehicles only
Source: United Kingdom Department of Transport Statistics Bulletin (88) 38

Industry structure

The road passenger transport sector is highly diversified, varying considerably from one Member State to the other. Alongside some very large operators there exists a majority of small ones. Medium and large sized operators tend to work more in the international market, whereas smaller units operate in national and regional markets.

The main operators in the EC-markets are National Express in the UK, De Jong Intratours and Beuk in the Netherlands, Iberbus, Julia and Alsa in Spain and Deutsche Touring (a subsidiary of the German railways) in Germany, Via International in France and Sita in Italy.

As indicated in table 3, Spain has a large number of companies. The average number of coaches, however, is lowest in this country. In the Netherlands, on the other hand, companies are fewer in number, but the average number of coaches per company is the highest.

At European level 40 operators of international regular services are members of Eurolines. Their membership of this organisation allows them to cooperate in arranging and publicising their services - an annual Eurolines timetable is published - comprising 160 lines which cover distances from the UK to Greece and from the Netherlands to Spain. Another such organisation is Europabus (a railway subsidiary) which operates in Germany.

Trends

In most EC-countries transport by private cars is increasing, following the growing demand for private mobility and the absence of adequate alternative public transport. Particularly in countries such as the Netherlands, the UK and Germany, transport by private car reached shares of 80% or more of the market in the early 1980's. Shares have increased further during the 1984-88 period. In these countries the booming growth in car transport has become a problem, not only for reasons of congestion, but also as a result of the

Table 3
Number of companies and coaches in some EC countries (1)

	Number of companies	Number of coaches	Average number of coaches per company
Belgique/België	600	3 000	5.0
BR Deutschland (2)	5 000	20 000	4.0
España (3)	9 000	26 000	2.9
France (4)	3 200	8 900	2.8
Italia	2 400	11 000	4.6
Nederland	287	3 638	12.6
United Kingdom	3 500	24 000	7.0

(1) Estimates for the period 1985-1987.
(2) In Germany, some 1 200-1 500 companies run both coach services and other tourist activities together, of which 1 000 are large companies. The other remaining companies occupy themselves principally with regular and occasional services.
(3) Some 10 400 of these 26 000 buses run on internal regular services. Another 6 000 vehicles are used by tour operators who often own the company as well.
(4) In France, one-third of these coaches are based in Paris and the surrounding area.
Source: Jacob Hofstra, Nationale Hogeschool voor Toerisme en Verkeer, Breda 12/88

Table 4
Stock of buses and coaches

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Belgique/België	19 560	18 948	18 744	17 866	16 947	16 550	16 250	15 869	N/A
Danmark	7 351	7 620	7 785	7 762	7 836	8 010	8 105	8 110	8 093
BR Deutschland	70 458	71 152	71 331	71 259	69 314	69 207	69 325	70 037	70 186
Hellas	18 011	18 493	17 701	17 591	17 841	18 237	18 485	18 748	N/A
España	42 631	43 303	42 996	43 759	41 161	41 593	41 874	43 002	43 991
France	65 000	66 000	69 000	68 000	62 000	64 000	65 000	65 000	65 000
Ireland	2 722	2 844	2 955	2 949	3 107	3 295	3 422	3 521	5 009(1)
Italia	58 149	62 168	66 688	71 017	71 981	76 296	77 891	82 100	N/A
Luxembourg	647	670	696	687	704	695	693	701	717
Nederland	11 200	11 400	11 500	11 600	11 500	11 600	11 400	12 000	11 700
Portugal	8 489	9 022	9 847	10 217	10 355	10 439	7 380	7 860	N/A
United Kingdom	78 291	76 593	74 963	74 928	74 992	74 743	76 268	78 200	N/A
EC 12	382 509	388 213	394 206	397 635	387 738	394 665	396 093	405 148	N/A
USA	N/A	N/A	N/A	N/A	583 671	593 527	593 728	602 055	N/A
Japan	N/A	N/A	N/A	N/A	230 063	231 228	232 516	234 137	238 021

(1) Including school buses
Source: EUROSTAT, International Road Federation (IRF)

growing consciousness of environmental issues.

In table 4 the stock of buses and coaches in each Member State is indicated. The growth rates of total stock throughout the years within the EC, but also in the USA and Japan have been very poor. For the EC the total stock increased by 0.8% annually between 1980 and 1987. Only Italy and Ireland were able to reach relatively high growth rates. In some EC-countries a negative annual average growth was achieved. For example Belgium achieved an annual average decline of nearly 3%.

Passenger transport by bus and coach - as is shown in table 5 - includes services offered by regular public bus services. Nevertheless, a tendency towards a modest overall growth can be observed. During the period 1980-88 the annual average growth rate reached a rate of 0.8% for the EC-10, which is equal to the growth in the total EC-stock of buses. Portugal and Spain recorded the highest individual growth rates, whereas Greece and Germany showed the most negative development throughout the 1980's.

In terms of absolute figures transport by bus and coach by the Italian population is the most intense with a total of 75 billion passenger-kms, followed by Germany, France and the UK respectively.

Tourist services

A large proportion of coach services is closely related to tourism. The services are generally combined with accommodation arrangements in so-called Inclusive Tours. This kind of tourism is very popular among lower and medium income households, as well as senior citizens, because of the lower prices offered by this transport in comparison to others. However, operators tend to offer high quality services on long haul routes in order to attract new customers and more passengers from train and air services.

Competition from other transport modes is considerable for long distances particularly air transport which takes a relatively large share of tourist transportation. In 1988, from the total number of passengers arriving in Greece, about three quarters travelled by air. In Spain air tourism had a

Table 5
Buses and coaches: passenger transport

Thousand million passengers-km	1975	1980	1986	1987	1988	Annual average growth 1980-1988 (%)
Belgique/België	9.6	9.1	9.5	10.0	10.0(1)	1.36
Danmark	5.7	7.3	9.0	9.0	8.7	2.22
BR Deutschland	58.7	65.6	53.1	52.9	52.4	-2.77
Hellas	4.8	5.8	5.0	4.8	4.8(1)	-2.77
España	26.9	28.1	33.5	35.2	37.5	3.67
France	28.9	38.0	39.8	42.2	43.2	1.62
Italia	42.3	57.8	70.5	72.7	75.1	3.32
Nederland	11.8	13.2	12.1	12.8	12.8	-0.38
Portugal	5.2	7.8	8.3	10.0	10.5	3.79
United Kingdom	55.0	45.0	41.0	41.0	41.0	-1.16
EC 10	248.9	277.7	281.8	290.6	296.0	0.80

(1) 1987 Data used again for 1988, since 1988 data are not available
Source: European Conference of Ministers of Transport, "Trends in the transport sector 1980-1988"

Table 6
Road passenger transport
Investments in infrastructure

(billion ECU of 1980)	1984	1985	1986	1987	Annual average growth (%)
ROAD					
Belgique/België	0.56	0.45	0.43	0.41	-9.87
BR Deutschland	4.73	4.82	4.95	4.79	0.42
Hellas	0.30	0.30	0.25	0.22	-9.82
Italia	2.21	2.44	2.80	2.92	9.73
RAILWAYS					
Belgique/België	0.21	0.22	0.19	0.18	-5.01
BR Deutschland	1.58	1.72	1.89	1.87	5.78
Hellas	0.03	0.05	0.04	0.04	10.06
Italia	1.27	0.98	1.52	N/A	9.40

Source: Transport Statistics for Europe 1990,United Nations

share of some 30%, in Portugal the share was about 15% and in Italy 9%. In recent years congestion in EC air transport has challenged its competitive position, benefiting other transport modes, including coaches.

EC legislation

The EC legislation has established three types of international coach services: occasional, shuttle and regular services.

Occasional and shuttle services are mainly tourist services. International regular services are subject to similar rules for national services (timetables, set routes and prices).

There is also an important category known as 'special regular services', which is for the transport of school children and employees to their place of work. Special regular services are principally cross-border, operating in frontier areas.

Only occasional international services are free from the requirement that prior authorisation must be obtained to run the service, from the State of departure, destination and often the States in transit.

In national coach transport, the categories of service vary from country to country and within certain States there is no category of shuttle services.

The degree of regulation of coach services varies greatly between each Member State. Certain Member States, such as the UK, have a very liberal system, where only qualitative controls govern the operation of a service (Transport Act). The Netherlands also have a relatively free system (Passenger Transport Law). However, in Spain the 1987 LOTT legislation prescribes very detailed provisions governing all road passenger transport.

The proposal for a regulation on common rules for the international transport of passengers by coach and bus, forwarded by the CEC to the Council on 15th April 1987, was intended to apply the principle of freedom in this sector.

Accordingly, the CEC has made two proposals. One is to introduce cabotage in road passenger transport, which will enable non-resident operators to carry out ad hoc passenger services within another Member State. A second proposal will enable operators from any Member State to run services between each State.

The CEC has also proposed changes in the EC legislation governing international coach services to introduce a certain liberalisation. Another proposal has been to abolish checks on the papers carried on coaches at internal borders, which should make it easier to establish and organise coach services and to reduce border delays.

Furthermore, a new Directive came into force on 1 January 1990, strengthening the existing provisions for becoming a passenger transport operator. In particular, it specifies the minimum financial requirements to ensure the viability of existing and potential operators, making the passing of a written examination compulsory for new entrants.

A parallel development to opening the EC market which will be of great assistance in raising standards of coaches and in ensuring the transparency of the market, is the introduction of a system of star rating for coaches set up by the International Road Transport Union (IRU).

The number of stars awarded to a coach indicates to the tour operator and potential customer the quality of a coach. This system is compulsory by law in Belgium, and the CEC showed some interest in having it adopted within the EC.

Investments

Most investments in coaches are for the replacement of existing capacity. Competition and legislation forces the operators to have buses and coaches with modern features to meet quality demand and compulsory standards.

In the future it is likely that more replacement investments have to be made. Buses and coaches will have to comply more with increasingly tough environmental protection standards set by authorities. This

implies that buses and coaches need to be adapted to meet new standards, which induces up-grading investments. Companies may also decide to replace old buses with new ones, as adaptation of old buses can be more costly.

Investment in infrastructure is important for the competitive position of the road transport sector. New road infrastructure will reduce congestion on roads. At the same time, investments in new railroad infrastructures will improve the performance of railways; this is expected to increase competition between the two transport modes. In table 6 infrastructural investments in roads and railways are indicated. Despite overall growth in road traffic, investment in the road infrastructure has decreased in recent years. This is due to limited availability of funds in most countries. In Italy however, the average growth in investments for both road and railways infrastructure was high. Germany and France are increasing investment in railway infrastructure as a result of the plans for new high-speed railway networks.

Outlook

The European integration will further stimulate transport in the coach sector as passenger mobility within the EC increases. Also competition in transport within the EC will increase due to cabotage possibilities. Moreover, governments are likely to discourage private car transport in order to reduce road congestion and air pollution. The opening of the Eastern European market will benefit the coach sector as most of the tourists coming from these countries choose this transport mode to reach tourist destinations in the EC.

As a result of the developments described, the sector will probably grow by 1% per annum in the coming years in terms of passenger-kms. This is above the current trend growth rate of 0.8%.

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Road freight transport

Favourable economic developments in the world economy during the 1980's had a positive impact on the volume of goods transported by road. Since 1983 international road traffic has grown considerably. Developments for both intra-EC traffic and third-country transport volume have been positive. The freight rates for international and national transport have been under pressure because of the growing number of internationally active road transport companies and also because of the suppression of tariff systems in international traffic. EC integration will inevitably lead to a further growth of intra-EC traffic. Community policy aims at eliminating physical barriers (diminishing border formalities and delays) as well as influencing the supply side of the market for road traffic (tariffs, licenses, technical standards, etc.) and harmonising taxes within the Community.

Description of the sector

The goods-haulage sector includes units exclusively or primarily engaged in the transportation of goods - regular or otherwise - by lorries or similar vehicles e.g. tractors, articulated vehicles, lorry-trailer combinations and road trains. The market for transport of goods by road is organised by a national regulatory framework, Community measures and bilateral agreements between Member States. International road transport is submitted to bilateral authorisations which are gradually being replaced by multilateral authorisations before being completely removed. Certain bilateral flows (such as between Benelux countries or for special categories of goods) are exempt from authorisations. Cabotage, that is the carrying out of domestic movements in a Member State different from the Member State of registration of the vehicle, was introduced recently on an experimental basis.

The market consists of many small transport companies.

In most EC countries the number of road transport undertakings is slowly decreasing, which indicates a move towards some co-operation between companies or concentration in the sector.

The Member States differ considerably in the number of hauliers, the evolution of

Table 1
Trends in National and International Intra-Community traffic 1983-90

(billion tonnes-km)	(1) 1983	(1) 1984	(1) 1985	(1) 1986	(2) 1986	(2) 1987	(2) 1988	(2) 1989	(2) 1990
National	417	427	435	455	538	571	615	664	704
International Intra-Community	80	85	88	91	114	125	141	158	172
Total	497	512	523	546	652	696	756	822	876

(1) Basis: EC 10
(2) Basis: EC 12
Source: Commission of EC, DG VII

this number, and the distinction made between own account carriage and haulage for hire and reward. Member States have different market access rules for long distance and short distance haulage respectively.

Current situation

The road-transport sector is characterised by small and medium sized operators in the south of the EC and larger operators in the north-west. Since 1983 EC road transport has grown.

The increase of intra-EC traffic is a result of the intensification of trade among Member States. For the EC-12 the steady growth of the early 1980's has accelerated somewhat in the last few years. In 1990, intra-EC traffic grew by 8.9%, against growth percentages close to 5% in the early 1980's. With the advent of European integration, growth rates are expected to rise further.

Especially in Southern Europe strong economic growth is likely to intensify intra-EC road traffic. Moreover, the unification of Germany will entail the development of the EC road transport sector.

National and intra-EC traffic

As far as national road traffic is concerned, it can be noted that of all Member States, the United Kingdom had the highest share in the total-kms of road traffic, namely, 21%, followed by Italy with 20% and the Federal Republic of Germany with 18%. The United Kingdom also accounted for the highest growth figure in 1988. Belgium followed with a considerable growth of 12.9%, ahead of France, the Netherlands and Portugal each accounting for a 10% increase in tonne-kms. Greece and Ireland were the only two Member countries to record negative growth.

In 1988 the total amount of tonne-kms achieved by merchandise road transport among EC countries was 141 000 million, accounting for nearly 19% of total tonne-kms. The increase of this intra-EC traffic of 12.8% in 1988 against 1987 already indicates where growth can be expected in the coming years.

The European integration will undoubtedly enhance the proportion of road traffic among Member States as trade is further liberalised and harmonised.

In terms of intra-EC road traffic, Greece is among the fastest growers: at a growth of 29% in 1988 it was the runner up behind Luxembourg. France also recorded a high growth rate, registering almost 24% more in 1988 than in 1987.

Only Denmark appeared to be unable to take advantage of the favourable trade conditions. It was the only country to record a decrease in tonne-kms. Of particular note is the leading position of the Netherlands in intra-EC road transport; more than half the country's total tonne-kms was derived from intra-EC traffic. France and the Federal Republic of Germany also took high shares of international road transport represented but a minor proportion for their total traffic in tonne-km.

Total road traffic between the Netherlands and the Federal Republic of Germany is very intense at 17.4 million tonnes of transport from the Netherlands to Germany and 19.2 million tonnes in the opposite direction. The same intense road traffic and even higher growth rates can be observed between Belgium/Luxembourg and France. However, in the latter case the traffic relations are far less unbalanced.

Transport increased exceptionally fast in Spain and Portugal. In fact, transport to the Iberian peninsula grew by more than 20%.

Costs

Liberalisation and harmonisation will affect supply in several ways. Trade between Member States and thus intra-EC road traffic will increase.

Competition between hauliers from different EC-countries will intensify, pushing freight rates downwards.

For the countries accounting for most of the road transport, the development of costs is illustrated. As table 3 shows, total

Table 2
Total international intra-EC traffic in mio tonne-kilometres: year 1988 and % change 1987 (inward + outward + cross-trades)(mio t-km)

From	To B	To DK	To D	To GR	To E	To F	To IRL	To I	To L	To NL	To P	To UK	EC12
Belgique/België		275	3 738	91	1 162	5 720	30	2 553	286	2 326	88	405	16 674
%		+10.0	+11.6	+49.2	+41.2	+20.4	42.9	+12.3	+18.2	+7.7	-29.6	0	
Danmark	130		1 594	97	139	451	11	501		326	51	103	3 403
%	+11.1		+35.9	+4.3	+3.0	+19.6	-54.2	-7.0		+10.9	-3.8	-79.0	
BR Deutschland	3 210	1 475		840	2 552	5 947	54	6 050	296	6 807	512	1 011	28 754
%	+14.8	4.3		+37	0	+6.3	-52.9	+6.1	+30.4	+10.9	+6.9	+4.6	
Hellas	59	44	958		9	157		72		226		109	1 634
%	+31.1	+22.2	+23.8		-86.0	-8.7	0	-13.3	-100	+43.0	-100	0	
España	912	197	3 228	13		4 667	29	1 394	5	1 075	758	1 580	13 858
%	+32.6	+4.8	+19.2	+325		+7.7	-46.3	-2.5	-54.5	+6.5	-16.8	-8.3	
France	4 153	406	6 494	237	3 820		73	5 896	166	2 064	644	1 759	25 712
%	+12.5	+0	+11	+66.9	+31.1		+69.8	+23.2	+95.3	+13	+17.5	+3	
Ireland	10	6	83	1	18	128		41		20	5	205	517
%		-61.5	-53.8	+31.7	0	-10	+23.1		-4.7		+222.2	0	-7,2
Italia	1 929	355	6 625	141	2 128	5 841	98		54	2 228	621	2 019	22 039
%		+15.2	-4.8	+8.9	+29.4	+51.4	+31.9	+92.2		-19.4	+6.1	+27.5	+7.5
Luxembourg	226	1	410	3	3	205		61		87	2	23	1 021
%		+16.5	+100	+15.5	+50	-82.3	+11.4	0	-6.2		+13.0	0	+35.3
Nederland	2 042	585	7 373	295	1 301	3 268	42	3 690	42		218	638	19 494
%		+9.5	+6.4	+11.9	+52.8	+6.6	+15.7	+55.6	+17.2	+7.7		+44.4	+16.2
Portugal	56	76	329		684	533		292	5	143		134	2 252
%		-33.3	+49.0	+8.6	0	+28.8	+7.2	0	+28.1	+66.7	+39.0		+36.7
United Kingdom	179	67	1 092	123	999	1 071	235	1 445	4	319	134		5 668
%		-10.0	-72.1	+21.1	+50	-4.5	+0.1	+23.0	-0.1	-33.3	+17.3	+5.5	
EC-12	12 906	3 487	31 924	1 841	12 815	27 988	572	21 995	858	15 621	3 033	7 986	141 026
%	+13.4	-0	+13.4	+41.6	+19.4	+15.0	+11.5	+11.4	+26.0	+10.4	+5.2	-0.02	+12,8

Source: Annual Report 1988, Directorate-General for Transport

cost inflation was highest in Germany at an average growth of 3.4%, followed by Denmark and France at average growth rates of 3.2%.

As fuel costs decrease for all countries shown, the greater part of cost inflation must be attributed to wage increases.

With the rise of fuel prices it is expected that margins will narrow still further.

Investments

Table 4 represents replacement and extension investments made in the EC-10 countries. The figures are not absolute but reflect the number of investing companies as a percentage of all firms. Among the different types of transport, investments in inland waterways are of relatively minor importance.

The investments in railway transport are developing much faster. Not only investment in high-speed trains but also that in the improvement of the overall quality of railroad transport may become a serious threat to the road haulage sector.

Moreover the problems facing road traffic in the Alps may increase competition from the railways to the road haulage sector.

The Channel tunnel will lead to changes in transport flows and also logistic locations.

Industry structure

The turnover by single company is highest in the Netherlands. Luxembourg is not fully comparable because the country is small and the part of the turnover that is represented by cross-border transport is relatively large.

Of the other countries, the Netherlands and Belgium have a transport sector that is more than proportionate compared with Germany, France and the UK.

Comparison of market shares confirms the strong competitive position which the Netherlands hold in intra-EC road freight, in relative as well as in absolute terms.

Belgium is also well placed on the intra-EC market.

The intra-EC market shares of Germany and France are also high, but compared to their national traffic their contribution to intra-EC traffic is of minor importance.

Italy and Spain are the other countries where intra-EC traffic is significant to the sector.

The UK can be expected to increase its intra-EC market share after the opening of the Channel tunnel.

This increase will probably affect competition between transport modes - sea and air freight - more than competition between UK and other road hauliers because

Table 3
Yearly evolution of total costs per nationality of hauliers, in ECU

	Belgique/België/ Luxembourg	Danmark	BR Deutschland	France	Nederland	United Kingdom	ALL
1982	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1983	101.8	110.2	109.0	108.5	108.6	100.4	106.4
1984	101.8	108.2	112.2	111.3	108.8	111.7	109.0
1985	110.1	118.4	115.5	120.1	111.0	111.9	114.5
1986	112.8	117.1	119.0	124.2	117.7	114.1	117.5
1987	112.1	119.7	119.6	121.1	119.3	98.0	115.0
1988	113.3	121.3	123.1	118.5	123.0	107.2	117.7
1989	114.4	124.3	125.8	123.8	123.3	120.7	122.1
1988	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1989	101.0	102.2	102.5	104.5	100.2	112.6	103.7
Average (average growth rate 82-89 in %)	+2.0	+3.2	+3.4	+3.2	+3.1	+3.1	+2.9
Fuel costs							
1988	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1989	99.9	105.9	98.4	109.0	102.0	108.0	104.1
Average (average growth rate 82-89 in %)	-3.8	-2.9	-2.2	+0.2	-3.5	-0.1	-2.1
Wages							
1988	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1989	100.7	102.7	102.5	103.2	99.3	112.9	103.3
Average (average growth rate 82-89 in %)	+3.3	+4.8	5.7	+5.4	+5.1	+3.6	+4.6

Source: Annual Report 1988, Directorate-General for Transport

the latter also stand to profit from the Channel tunnel.

The Community's total fleet of nearly 9 million vehicles is small compared to the USA's, but with the completion of the Internal Market the increase of the total weight of vehicles may influence their total number. Spain, the UK and Italy possess the most goods-carrying vehicles; in each country almost 2 million were registered in 1988. However, the picture changes when we look at the use of these vehicles.

For Spain, the UK and Italy, utilisation of the vehicles lies below the EC average of 90 000 tonne-km per year.

The Netherlands and Luxembourg, at over 400 000 tonne-km a year, use their vehicles the most intensively, followed by France (330 000 tonne-km a year) and Belgium (280 000 tonne-km a year).

Table 4
Average % of firms having made investments

	1982	1983	1984	1985	1986	1987	1988
Belgium/België	35	43	41	43	45	49	49
Danmark	41	50	54	56	53	47	43
BR Deutschland	32	42	40	38	47	47	45
Hellas	32	37	34	30	33	39	37
France	36	30	32	30	34	38	37
Ireland	23	36	46	46	39	44	58
Italia	23	25	28	29	33	39	43
Luxembourg	33	36	39	48	53	70	70
Nederland	44	44	58	55	57	56	58
United Kingdom	61	62	71	69	45	N/A	86
EC-10	35	36	38	37	41	43	44

Source: Annual Report 1988, Directorate-General for Transport

Geographic variance

In 1986 the total amount of international transport between EC Member States was 446.9 million tonnes.

The EC countries in the North-West region - the Netherlands, Belgium, the North-Eastern regions of France and the Federal Republic of Germany - accounted for 87.2% of the total transport to other Member States and 90.2% of total transport from other Member States.

In Germany, France and the Netherlands freight road transport represents nearly

70% of the total merchandise transport, while in other countries such as Italy, Greece and Denmark, the percentage amounts to more than 90%.

This difference can be partly explained on topographical grounds (Greece) partly by the low degree of efficiency of alternative transport modes (Italy) and partly by the low level of public investment in rail and inland waterways (Greece, Denmark).

Hauliers are paying special attention to the developments in Eastern Europe. Recent political changes will inevitably lead to a more market-orientated economy, which opens prospects for EC members.

EC policy

The White Paper which was adopted in 1985 contains the measures to be taken to strengthen the European internal market, in three separate policy areas:

- measures to eliminate physical barriers such as border formalities;
- measures influencing the supply side;
- harmonisation of value added taxes and excise duties.

Table 5
Enterprises and employment

		Number of enterprises	Turnover (excl.VAT) Mio ECU	Gross value added at market prices (excl.VAT)	Number of persons employed
Belgique/België	1987	7 869	4 131.6		(1) 29 567
BR Deutschland	1986	39 575	15 039.7		(2) 151 072
France	1986	29 005	13 776.5		
Italia	1981	95 766			212 282
Luxembourg	1987	289	1 155.0	69.1	2 057
Nederland	1987	8 074	4 548.3	2 971.8	79 400
Portugal	1982	3 529	261.1	110.6	14 862
United Kingdom	1987	34 873	12 760.2		(2) 259 000

(1) Number of wage and salary earners, 1986
(2) Number of wage and salary earners, 1988
Source: Eurostat

The abolition of border formalities will prevent unnecessary delays at the border and thus enhance productivity figures.

The issue of authorisations, the fixing of tariffs and driving times, the imposing of technical standards and taxes on motor vehicles, are actions that can affect the supply side of the market, for instance, the number of vehicles on the road.

The European Minister for Transport has already decided to increase the number of authorisations issued by 40% in 1988 and 1989. A similar proposal for the period 1990-1992 has been put forward by the European Commission.

The Ministers also decided upon the elimination of all quotas as from 1st January, 1993. From then on the authorisation to enter the market will depend on qualitative criteria.

On 1st January 1990, the old tariff system within the Community was replaced with a new one which is based on free price fixing.

By improved coordination the Community is trying to improve the observance of social measures, e.g. to extend its span of control, to prevent drivers from neglecting the measure dating from November 1985 which regulates their hours of

Table 6
Share of the market held by the hauliers, 1988

	National			International Intra-Community			Total		
	1000 Mio. tonne-km	88/87 (%)	Country Share (%)	1000 Mio. tonne-km	88/87 (%)	Country Share (%)	1000 Mio. tonne-km	88/87 (%)	Country Share (%)
Belgiques/België	12.4	12.9	2	17.1	10.5	12	29.5	11.3	4
Danmark	9.1	2.8	1	4.6	-1.8	3	13.7	1.5	2
BR Deutschland	110.8	5.7	18	23.1	11.4	16	133.9	6.6	18
Hellas	12.4	-5.4	2	2.6	29.0	2	15.0	-0.6	2
España	89.7	5.8	15	14.8	0.6	10	104.5	5	14
France	97.6	10.5	16	25.4	23.8	18	123.0	13.1	16
Ireland	3.9	-1.0	1	1.0	8.7	1	4.9	0	1
Italie(1)	121.0	3.0	2	15.4	15.2	11	(1) 136.4	4.4	18
Luxembourg (1)	0.3	8.0	0	1.6	35.6	1	(1) 1.9	26.7	0
Nederland	21.9	9.6	4	25.8	12.4	18	47.7	11.4	6
Portugal	9.5	9.6	2	2.2	3.8	2	11.7	9.3	2
United Kingdom	126.7	15.3	21	7.4	8.2	5	134.1	14.8	18
EC 12	615.3	7.7	100	141.0	12.3	100	756.3	8.6	100

(1) Provisional data
Source: Commission of EC, DG VII

Table 7
Number of goods vehicles, 1988

	Number of vehicles	Range (mio tonne-km/ vehicle)	Country Share (%)
Belgique/België	(1)106 507	0.28	1
Danmark	(2)235 249	0.06	3
BR Deutschland	1 327 638	0.10	15
Hellas	(3)602 086	0.02	7
España	1 975 817	0.05	22
France	(4)375 000	0.33	4
Ireland	118 764	0.04	1
Italia	1 906 000	0.07	22
Luxembourg	4 406	0.43	0
Nederland	114 200	0.42	1
Portugal	(1)78 600	0.15	1
United Kingdom	1 951 000	0.07	22
EC 12	(5)8 846 074	0.09	100
USA	(1)41 118 762		
Japan	(6)21 440 494		

(1) 1987
(2) Including vans over 2 tons
(3) 1985
(4) Including vans with over 5 gross weight tons
(5) Estimation
(6) Including three-wheeled vehicles
Source: IRF

Table 8
International EC transport (mio. tonnes)

Means of transport	Total	NW Europe (1)		Other EC-12	
		To	Transport From	To	Transport From
Road	189.0	155.7	157.6	33.3	31.4
Inland waterway	192.6	191.4	191.1	1.2	1.5
Railways	65.3	42.5	54.4	22.8	10.9
Total	446.9	389.6	403.1	57.3	43.8

(1) Benelux, Germany, France
Source: Eurostat

driving.

Plans to harmonise taxes and excise duties have remained without result.

For the value added tax no single EC tariff is to be expected for the EC; a more realistic expectation is that of ranges for the existing high and low tariffs.

Other Community measures that may affect the road transport of merchandise are associated with EC policy on environment and infrastructure. In an attempt to express the close relation between traffic and environment, the principles of that policy have been reformulated.

Competition among different types of transport should not be based on pure business-administrative arguments, but also on external costs, that is, the implications for the environment, congestion costs and safety. Hence, a higher tax on road transport may be implemented in the future.

Other measures are especially aimed at improving the infrastructure of economically less developed areas. Another important aspect of freight transport is cabotage, which is currently not permitted in road haulage by any host State in Europe.

The decision which the EC Transport Council has made, after long discussions, about cabotage therefore constitutes a real break-through. During the transitional period (1990-1992) a quota of 15.000 allowances with a validity of two months - is to be distributed among the 12 Member States and cabotage will be submitted to certain national rules e.g. tariffs and taxes.

Outlook

Liberalisation and harmonisation are the two main themes for '1992. The European integration and the presumed ensuing economic growth will affect the volume of total transport.

Effects can also be expected from the restructuring of means of transport following altered relations in terms of costs and time, and from the redistribution of flag-shares among transport companies of different Member States due to changed relative cost levels.

For hauliers the European integration may produce some general advantages such as an increased transport volume, more third-country transport, cabotage, simplified foreign establishment, and co-operation with foreign transport operators.

As far as the environment is concerned, the council is expected in the near future to adopt some obligatory rules to improve the quality of vehicles and to define other conditions necessary to reduce the environmental impact of road haulage.

Stronger competition may be expected from railway transport as investment in high-speed trains and railroad sections increases. Meanwhile developments in Eastern Europe may provide opportunities for trade, and thus traffic, to intensify.

Competition from Eastern European Countries may become relevant if their com-

Table 9
Outlook

	1988	1989	1990	91/90	92/91
National goods traffic (1000 mio tonne-km)	615	664	704	6%	6%
Intra-EC goods traffic (1000 mio tonne-km)	141	158	172	10%	11%
Total (1000 mio tonne-km)	756	822	876	7%	7%

Source: NEI

parative advantage of low wages is coupled with an increase in the quality of service. Intra-EC traffic and traffic with third countries will grow significantly faster than national traffic.

One reason is that hauliers can react to future developments faster than other modes of transport because the re-routing of existing capacity requires little investment. Only in the medium to long term will investments in other modes of transport make these latter become competitive with the road haulage sector.

Written NEI: Nederlands Eonomisch Instituut
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Inland waterway transport

About 40 per cent of all transport between EC Member States is effected by inland waterway (measured in tonnes). The economic crisis in the early 1980's brought about a stagnation of demand and even a decline in some years. Recent restructuring of the industry has led to the replacement of a large number of small old boats by large modern units which operate with shorter turnaround times.

Thus, even though the loading capacity went down, the total transport capacity has increased in recent years; there is now an excess capacity which is currently estimated at about 20 per cent.

To abolish the structural overcapacity, a Community scrapping scheme came into force on 1 January 1990; moreover, because of improved demand prospects, prices are expected to go up and the sector's profitability is likely to improve.

The union of the Federal Republic of Germany and the German Democratic Republic and the opening up of other East-European economies will undoubtedly enhance trade with those countries provided the infrastructure is improved.

Sector description

This class includes units exclusively or primarely engaged in the transportation of passengers and goods on rivers, canals, lakes, lagoons and within river ports.

Also to be clasified under this heading are units exclusively or primarely engaged in the operation of tugs and push boats on inland waterways.

The sector of inland waterway transport consists of companies operating ships of various sizes to convey goods throughout Europe on the available inland waterway network.

Goods are mainly of the bulk type, but other types of goods such as containers and passenger cars become more and more important.

Passenger transport on inland waterways is only incidental, for instance leisure trips or ferries.

Table 1
Total traffic on Community network, 1983-88
Volume transported by network (1)

(1000 tonnes)	1983	1984	1985	1986	1987	1988	1989	Growth rate 1989/83	Growth rate 1989/88
Belgique/België	87 105	94 227	89 439	91 288	90 956	96 008	96471	10.8	0.5
BR Deutschland	212 353	223 966	210 401	215 246	207 548	218 564	219485	3.4	0.4
France	66 085	63 255	59 353	58 486	56 968	60 340	56937	-13.8	-5.6
Luxembourg	1 997	2 128	1 761	2 021	1 922	2 134	2055	2.9	-3.7
Nederland	214 347	221 298	221 479	238 116	240 671	250 486	257822	20.3	2.9
EC 5	384 550	396 637	380 443	397 230	395 062	410 656	N/A	N/A	N/A

(1) For each country, the figures are: import + export + national transport.
For EC 5,the figures are:total national transport + total export.
Source: Eurostat; UN, Transport Statistics for Europe, 1990 Annual Report

The network

The Rhine, being navigable over a distance of 1 000 km - from Basel in Switzerland to the North Sea - is clearly the backbone of the EC waterway system.

Other rivers like the Meuse, the Schelde and the Elbe are interconnected with the Rhine by means of canals navigable for vessels of at least 1350 tonnes, the so-called Europe, class IV, standard vessel.

Further, a coherent network has been created of waterways navigable for units with a loading capacity from 1 350 to 10 000 tonnes (pushed convoys on the Rhine and certain other sections) which covers most of the Federal Republic of Germany, the Netherlands, Belgium, Luxembourg and the northern and eastern frontier zones of France.

This network will be extended to Eastern Europe in 1992 if the capacity of the Rhine-Main-Danube canal also supports the heaviest loaded vessels. Except for this route, a northerly transit to Eastern Europe between the Netherlands and Germany is also possible through the Mittelland Kanal. It is not certain right now whether measures will be taken to improve its capacity.

In the French hinterland, the rivers Seine and Rhône, being navigable for pushed convoys of 5 000 tonnes, play an important role. However, to date, these rivers are only connected with the main European network by narrow canals.

Apart from local transport operations on certain rivers in the UK, Italy and Portugal, inland waterway transport does not play a role in any of the other Member States.

Current situation

In 1980 and the following years the effects of the economic crisis hit almost all sectors of the economy and in particular those sectors that generate massive bulk transport, such as the building industry (sand and gravel transports), the steel and chemical industry (ore, coal and chemicals) and the energy sector (oil products, coal). These commodities account for more than 70 per cent of total inland waterway transport.

Since 1983 demand has recovered slightly. After some years of stabilisation around the figure of 395 million tonnes, in 1988 the total volume transported exceeded 410 million tonnes for the EC 5, (see table 1).

In 1988 the Netherlands was the absolute leader in inland waterway transport, totalling a transported volume of more than 250 million tonnes, the Federal Republic of Germany ranking second.

Those positions are also reflected in the number of people employed in both countries.

In 1987, 14 090 people were employed in the Netherlands in inland waterway transport; in 1986, the number of wage and salary earners in this sector amounted to 11 707 in the Federal Republic of Germany.

In 1987, international transport represented 47 per cent (186 million tonnes) of the total volume carried on inland waterways in the Community.

The remainder represents the sum of domestic transport in Belgium, Germany, France and the Netherlands.

Production of transport services

For all EC countries total traffic amounted to nearly 427 million tonnes, an increase of 3.9 per cent over the previous year.

Only Italy reported a decrease in total traffic. Total tonnes/km were 85 752 million, an increase of 4.9 per cent over 1987.

France has recovered from the steady decrease during the early 1980's, recording a growth in volume of 6.7 per cent in 1988.

Measured in tonnes transported, inland waterways carry 38.6 per cent of all inter-

Table 2
Freight transport on the Rhine

(1000 tonnes)	1980	1987	1988	Growth rate 1988/87 (%)	Growth rate 1988/80 (%)
Total goods carried	282 721	276 430	292 942	5.97	0.44
International transport	170 251	172 993	188 047	8.70	1.25
Of which between the Netherlands and the Federal Republic of Germany	129 894	132 445	138 482	4.56	0.80
Of which transit through FRG	13 948	13 266	14 582	9.92	0.56
National transport	112 470	103 437	104 895	1.41	-0.87
Total tonne-kilometres (Millions)	56 873	58 038	60 375	4.03	0.75

Source: UN, Transport Statistics for Europe, 1990 Annual Report

national transport between EC Member States. The figures for road and rail are 48 and 13 per cent, respectively (EC 12).

Table 2 illustrates the importance of the Rhine as a route for inland waterway transport. Total goods carried amounted to 293 million tonnes in 1988, an increase of almost 6% over the previous year. International transport accounted for 64% of this volume, with national transports absorbing the remaining 36% share.

Of international freight transport on the Rhine, almost 66 per cent took place between the Netherlands and the Federal Republic of Germany excluding transit traffic. Total tonne-kilometres increased by 4 per cent over 1988, equalling a total of 60 000 million. The figures show that growth was considerably faster in 1988 than in the years between 1980 and 1987, which clearly indicates the recovery from the economic crisis of the early 1980's.

Trends in capacity

The Community inland waterway fleet has a carrying capacity of 12.5 million tonnes. The Dutch fleet accounts for 47 per cent of the total capacity, while the German fleet holds the second position with 26.5 per cent. The Netherlands and the Federal Republic of Germany were the only countries that recorded an increase in fleet capacity.

In the recent past a large number of small old boats have been replaced with large modern units.

That trend still continues. Between January 1979 and January 1988 the total number of vessels went down by 23.6 per cent whilst the carrying capacity was reduced by 5.6 per cent.

Modern vessels are more productive in the sense that they operate at shorter turn-

Table 3
EC fleet in number of vessels and carrying capacity

(1000 tonnes)	Fleet	1979(1)	1989(1)	Growth rate 1989/88 (%)	Growth rate 1989/79 (%)	Fleet share 1989 (%)
Belgique/België	Vessels	3 321	1 947	-11.9	-41.4	12.9
	Carrying capacity	1 955	1 422	-13.7	-27.3	11.4
BR Deutschland	Vessels	4 230	3 060	-0.1	-27.7	20.3
	Carrying capacity	3 859	3 324	2.3	-14.1	26.5
France	Vessels	5 525	3 843	-10.5	-30.4	25.5
	Carrying capacity	2 618	1 905	-8.9	-27.2	15.2
Nederland	Vessels	6 631	6 206	-0.2	-6.4	41.2
	Carrying capacity	4 840	5 880	4.1	21.5	46.9
EC 4	Vessels	19 707	15 056	-4.6	-23.6	100.0
	Carrying capacity	13 272	12 531	-0.8	-5.6	100.0

(1) At January 1st
Source: Eurostat; UN, Transport Statistics for Europe, 1990 annual report

Table 4
Share of private owner operators in the National Fleets, 1988 (1)

(%)	Share in number of ships	Share in carrying capacity
Belgique/België	52	86
BR Deutschland	50	38
France	61	63
Nederland	71	67

(1) At 1/1/88
Source: Commission of EC, DG VII

around times, which has boosted the total transport capacity of the fleet even though the loading capacity went down.

Since 1980 a structural imbalance between supply and demand has been causing serious problems in the inland-waterway sector.

The most important causes of that phenomenon are the downward trend in demand in the period 1980-83 and the ongoing productivity increases due to modernisation of the fleet.

The surplus capacity is now generally estimated at about 20 per cent of the Community fleet.

The overcapacity has a negative effect on the evolution of prices on the free market. For example: for dry cargo, Rhine transport prices in 1988 were still on the level of 1979, whilst costs have increased in the same period by more than 50 per cent.

EC rehabilitation programme

To remedy the situation, the Council, following a proposal of the Commission, established in May 1989 an EC capacity-regulation system entailing:

- measures to set up and coordinate the functioning of national scrapping schemes by harmonising the basic principles and procedures throughout the Community;
- provisions to prevent the impact of a coordinated scrapping action from being cancelled out by limitations on the bringing into service of new vessels.

The Swiss authorities have simultaneously introduced similar measures for the Swiss fleet. The scheme intended to eliminate 10 per cent of the dry-cargo fleets and 15 per cent of the tanker fleets; at the end of 1990, around 1600 vessels with a total loading capacity of more than 1.000.000 tons were withdrawn from the inland waterway markets.

Market structure

The inland-waterway sector is characterised by the existence of a large number of private owners mostly operating only one vessel, with the owner's family living on board.

Large shipowner companies exploiting fleets of 20 to 100 vessels mainly operate on the Rhine and its branches.

On this market there are also cooperatives of private owner operators working together to compete with the shipowner companies for large-scale contracts.

The international Rhine market, which covers more than 75 per cent of total international transport, has a completely free market regime.

That means: free pricing, free access to the market for all companies registered in Rhine and EC States, no authorisations required.

The domestic markets and part of international transport other than on the Rhine, are subject to obligatory tariff regulations and traffic-sharing systems.

Outlook

Under the influence of the improved economic situation, demand for inland waterway transport has shown an upward trend since 1988, in particular in international traffic. As the economy is expected to continue growing in the EC for some years to come, the growth of total traffic will also hold.

A positive injection for inland waterway transport can be expected from the European integration in 1992, when borders disappear and trade among Member States is further intensified.

The developments in Eastern Europe will affect traffic in two ways. Firstly, positive developments are to be expected from the union of Germany, and secondly, the economic and political developments of Eastern Europe in general also promise market opportunities and hence intensifying trade.

Inland-waterway transport can take advantage of these developments in particular if the infrastructure can accommodate the largest vessels.

However, the evolution of demand so far appears to have had no significant in-

Table 5
Inland watering transport Forecasts

	1988	1989	1990	91/90	92/91
Total traffic					
Volume (mio tonnes)	411	425	435	2%	2%
Tonnes/kilometres (mio)	85 752	89 000	91 000	3%	3%

Source: NEI

fluence on the price level and hence on the profitability of the sector.

The general expectation is that the EC scrapping system in combination with the present trend in demand will produce a new equilibrium between supply and demand in the near future.

This would lead to a better utilisation of the vessels that will stay on the market and also to a higher revenue level per tonne.

The volume of total traffic is likely to continue growing with a moderate growth rate. The transport distance is likely to grow at a higher growth rate due to EC integration and Eastern European developments.

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Shipping

The recovery in the shipping industry already noted in last year's Panorama has continued in 1989. In addition to the growth in volume, shipping rates have also augmented.

The EC fleet has suffered in recent years from a lack of investment and has had difficulties in remaining competitive on world markets. The proportion of new tonnage in the EC fleet is now lower than in most of its competitors. All countries will have to renew a large part of the tanker and bulk fleets in the 1990's

Sector definition

NACE 74 includes units exclusively or primarily engaged in the transportation of passengers and goods in sea-going and coastal vessels. Also classified under this heading are units exclusively or primarily engaged in the transportation of passengers and goods in the operation of sea-going tugs.

Sea transport refers to shipping on long sea routes, coastal shipping refers to the conveyance of passengers and goods between national or European ports and those in the Baltic Sea, the Black Sea and the Mediterranean.

The industry is very fragmented; there are major diversified liner companies but also one-vessel captain-owners. There are large producers who carry their own cargoes, and major ship-owners specialised in bulk shipping or in the rental or leasing of ships.

Current situation

The average yearly growth rate of world trade was of 7.5% in real terms during the eighties. Seaborne trade grew correspondingly, by 5.5% in volume and 6% in tonne-miles.

This growth, in combination with the low price of oil, was enough to absorb all the excess shipping capacity. The pattern of goods carried has changed considerably since 1979.

Although growing by 9% in 1988/89, the oil trade was still well below the levels of 1979. Dry cargo, particularly coal and other goods -including minor bulk, containers, gas and chemicals- account for the overall growth.

In 1989 average charter rates for containerships were 17% higher than in 1988, and demand for the larger vessels, around 2000 TEU, was particularly strong (TEU is the capacity unit in the container trade, being equivalent to a 20-foot-long standard container). For some time the average weight of a loaded container has been rising as a result of the miniaturisation of industrial products.

This has led to a demand for ships with a higher ratio of dwt/TEU. Rates in this market are now considered to have levelled out, and no great change is expected in the near future.

Table 1
Development of world seaborne trade

	Million tonnes			Billion Tonne-miles		
	1979	1983	1989	1979	1983	1989
Crude Oil	1 497	930	1 135	9 452	4 478	5 620
Oil Products	279	282	335	1 045	1 080	1 490
Iron Ore	327	257	375	1 599	1 320	1 965
Coal	159	197	315	786	1 057	1 780
Grain	182	199	195	1 026	1 135	1 110
Other Goods	1 270	1 225	1 540	3 605	3 510	4 270
Total	3 714	3 090	3 895	17 513	12 580	16 235

Source: Fearnleys Review 1989

available fleets, and as a result of the continuing growth in seaborne trade, rates for the other sectors were also firm.

Tanker rates fell in the early part of 1989 but recovered at the end of the year. Rates for capsize bulk carriers were firm but stable. The handy size and general-cargo markets, however, were adversely affected by the political turmoil in China.

Short sea trade

The quantity of cargo moving within Europe is immense. Including traffic with Eastern Europe and North Africa, it amounts to about 300 million tonnes of dry bulk and 490 million tonnes of liquid bulk in international trade. The latter figure includes 140 million tonnes of crude oil shipped to Western Europe from Middle-East pipelines which terminate in east Mediterranean ports.

Additionally, about 60 million tonnes of cargo are transhipped at European ports to or from smaller vessels.

About 300 million tonnes are carried in West European trades, of which 210 million tonnes represents trade among Member States.

In 1983, EC flag vessels had a share of 69% in trade among Member States against 40% in trade with developing countries.

The corresponding percentages in 1986 were 65% and 40%, respectively (the Federal Republic of Germany, the UK, Belgium and the Netherlands only).

European short-sea trades still have the characteristics of regional markets. Mediterranean trade consists mostly of national traffic, which is confined to national flags, and international traffic across the Mediterranean to North-African countries subject to some sort of regulation. Therefore, in these trades there is not always open competition. By contrast, in and around the North Sea there is fierce competition between short-sea fleets owing to the UK's national trade being open to all flags.

The Federal Republic of Germany, the Netherlands and Denmark dominate the international short-sea trades.

The short-sea freight market tends to follow the market for larger vessels, albeit usually with a time lag of several months. Therefore a gradual increase in freight rates and an improvement in the volume of short-sea trades are expected. Short-sea owners dominate the specialised trades under European flags, many owners of larger vessels having opted out of the trade under these flags. Specialised trades include chemical vessels, liquid-gas tankers, reefer trade, car carriers, the carriage of heavy lifts, and chartered containers.

Markets for the liquid-gas and reefer trades are much less volatile than those for tankers and bulk carriers, because owners either charter their vessels to traders or join the freight pools of large operators. The freight market for these specialised trades started to recover in 1986, but heavy-lift shipping only started its slow recovery in 1989.

About half of the 22.8 million TEU shipped in deep-sea container trades in 1987 was carried on trade routes to and from Europe (including non-EC countries).

The short-sea trade within Europe generated a further 3.8 million TEU of container traffic, equivalent to 41% of the combined short-sea trade of Europe, North America and the Far East.

Seaborne trade

Seaborne trade between the EC and developing countries amounted to approximately 1 000 million tonnes in 1983, equivalent to 30% of the estimated international seaborne trade of 3 090 million tonnes in that year. As regards major bulk commodities, in 1987 the Community had a share of 39% in world seaborne imports of iron core, 34% of coal, 8% of grain, 31% of bauxite, alumina and phosphate, and about 34% in the seaborne crude-oil trade of 970 million tonnes.

In the important Far East/Europe trade route, outsiders (non-conference liners including the Trans Siberian Railway) carry about 40% of the liner trade; EC conference members about one half of the remaining 60%.

Larger shares of up to 50% are obtained by outsiders in the trade with the USA, which imposes more restrictions on conference lines than the EC.

In general-cargo trades with many developing countries, particularly those in Africa and Latin America, conference trade is often divided in accordance with the 40:40:20 formula of the Unctad Code, whereby the national carriers in the trade between two countries each have a share of 40%, the remaining 20% to be divided among cross traders.

Ports

Rotterdam is still by far the largest port, followed by Marseille and Antwerp.

London and Hamburg are the only two cities which did not take advantage of the increase in seaborne trade and the recovery of the world economy during the period 1985-1989.

Employment

National governments and the European Commission want to maintain a Community fleet not only for strategic and commercial reasons but also because of its contribution to the European economy in terms of income, employment, the balance of payments, etc. Employment has decreased from about 250 000 crew members in 1980 to about 146 000 in 1989.

The decrease is due to the movement away from Community flags to open registers where manning costs tend to be low.

Table 3 shows that the share of foreigners employed was especially large in the Netherlands and in Germany.

In many cases the shift away from the national flag was accelerated by strike actions which caused wages to increase in several countries. In addition to those employed directly in the shipping industry, many more are employed in associated activities, such as insurance, shipbuilding, ports, etc.

Table 2
Top Ten Seaports of the EC

Country		Total traffic mio. tons 1987	Index 1985=100
Nederland	Rotterdam	255.0	104.3
France	Marseille	91.3	102.1
Belgique/België	Antwerp	91.1	105.7
BR Deutschland	Hamburg	56.7	95.3
France	Le Havre	51.1	104.9
United Kingdom	London	44.2	95.1BR
United Kingdom	Tees-Hartlepool	33.5	110.9
France	Dunkerque	32.4	100.6
Deutschland	Bremen-Bremerhaven	30.0	100.7
Nederland	Amsterdam	29.6	114.7

Fleet capacity

The world merchant fleet grew by 2.6% in dwt in 1989, but is still 6% below its total at the beginning of 1982.

In 1989 orders for new vessels increased by more than 49% (in CGT), which indicates that many shipowners felt the economic conditions were right to invest in replacing their fleet. New orders were especially placed for dry-cargo ships (90% increase in CGT against 1988) and oil tankers (232% increase in CGT against 1988) to follow the prospects of world seaborne trade.

The increase in new orders in 1989 demonstrates that the shipowners have started to replace the older vessels in their fleet, although the shares of 0 to 9 year old vessels decreased for all types and areas compared to 1988. Apparently the average age of the EC fleet is still high, but most EC shipowners have an excellent safety record.

Stringent regulations by Member States and port state control, initiated by the EC, but applied in the whole of Western Europe, contribute to the low level of accidents in which EC vessels are involved.

Table 4 gives the shares of country groups in the main types of vessels in the world fleet. Compared to 1988, EC shares dropped for almost all types of vessels. By the end of 1988, the EC had a share of 16.2% in the world Oil-tanker fleet and a

Table 3
Shipping industry
Employment, 1989

(number)	Total	Of which own nationality	%
Belgique/België	2 539	2 002	78.8
Danmark	9 370	8 154	87.0
BR Deutschland	15 077	11 816	78.4
Hellas	30 150	25 100	83.2
España (1)	19 873	19 873	100.0
France	11 230	10 870	96.8
Ireland	1 365	1 103	80.8
Italia	25 237	25 237	100.0
Nederland (1)	9 680	7 095	73.3
Portugal	1 790	1 790	100.0
United Kingdom	19 335	17 831	92.2
EC	145 646	130 871	89.9

(1) 1986 figures
Source: National Shipowner Associations

Table 4
World fleet by type and area shares, 1989 (1)(2)

Type of vessel	Total fleet mio dwt	EC %	Other OECD %	Open registry %	State trading %	Others %
Oil tankers	244.9	16.2	19.0	42.3	3.5	18.9
Chemical carriers	6.1	15.1	27.9	35.9	1.5	19.6
Liquid gas tankers	14.5	13.9	40.3	24.9	2.0	19.0
Bulk carriers	185.4	14.5	13.6	32.8	6.4	32.7
Oil/bulk/ore	38.1	13.1	13.5	49.5	4.2	19.7
General cargo						
Multi-deck	68.1	11.9	13.2	21.5	18.4	35.0
Single-deck	34.5	8.6	16.6	33.0	11.7	30.1
Cellular container(3)	24.5	25.1	22.2	21.3	3.2	28.3
Ferries (4)	7.9	31.4	34.7	8.4	8.4	17.1
Passenger vessels (4)	2.6	30.1	15.8	39.5	11.9	2.8
Cruise vessels (4,5)	2.4	25.1	10.2	50.1	12.4	2.2

(1) At 1/1/89
(2) Vessels of 300 gross registered ton (grt) and over
(3) Percentages derived from total capacity of 1.4 million Twenty-feet Equivalent Unit (TEU)
(4) Expressed in million grt
(5) 1987 data
Source: ISL Bremen

share of 14.5% in the world Bulk-carrier fleet. In the general-cargo trade with multi-deck and container vessels, EC companies no longer have their once dominant position. Their share in the carrying capacity of the world container fleet decreased by almost 27% to a level of 25.1%.

In the world passenger and ferry fleets, especially those of the car/passenger ferry type, the EC share dropped to a level of 30.1%, more than 2% lower than the 1988 share. The United Kingdom with its many ferry services to Ireland and the Continent had the largest share of 23% in the GRT of the EC ferry and passenger fleet in 1988, followed by Greece and Italy. In cruise vessels, North America offers the largest market. The UK had with 45% by far the largest share in the EC tonnage, again followed by Greece and Italy.

Table 5 demonstrates the decline of the European fleet in 1989 except for that of Ireland. The total fleet of Spain, measured in 1 000 dwt, was even reduced by 12.6% in that year. The reduction in the Community fleet during the 1980's has been compensated to some extent by an increase in the tonnage in open registers, owned by EC nationals, from 38.5 to 64.2 million dwt between 1981 and 1987. Although the world total oil-tanker fleet increased by 1.7%, the EC share dropped by nearly 8% to 39.7 million dwt.

In terms of tonnage, Greece has the largest fleet among EC members. Although it decreased from 73.5 to 42.8 million dwt in 1987 and continued the downward trend to 38.5 million in 1989, its share in the EC fleet remained rather stable at 41.6% in 1989. Moreover, Greek nationals owned in 1987 45.2 million dwt or 70% of the EC-owned fleet registered under flags of convenience.

Regarding the main fleets of other OECD countries, in early 1989 Japan had with 43.9 million dwt a larger fleet than Greece. The American and Norwegian fleets of 27 and 19 million dwt, respectively, together counted for not much less than the combined fleet of over 52 million dwt of the other EC countries.

Table 5
Merchant fleet by flag January 1st, 1988 and 1989
(ships of 300 grt/gt and over)

EC	no. of ships		1000 dwt		change	share of total	
	1988	1989	1988	1989		1988	1989
Belgique/België	91	87	3 310	3 198	- 3.4	3	4
Danmark	421	402	6 395	6 336	- 0.9	7	7
BR Deutschland	800	697	4 791	4 606	- 3.9	5	5
Hellas	1 516	1 458	41 088	38 491	- 6.3	42	42
Espana	519	463	7 538	6 588	- 12.6	8	7
France	247	225	7 112	6 526	- 8.2	7	7
Ireland	59	66	144	165	14.8		
Italia	862	801	11 557	11 104	- 3.9	12	12
Luxembourg	1	1	3	3	0		
Nederland	515	486	4 056	3 980	- 1.9	4	4
Portugal	72	69	1 549	1 399	- 9.7	2	2
United Kingdom	671	629	11 026	10 077	- 8.6	11	11
EC	5 774	5 384	98 569	92 473	- 6.2	100	100

Source: ISL Bremen 1989

Investment

Operating at nearly full capacity, a large share of the EC fleet is older than 9 years and consequently due for replacement. EC shipowners are confronted by two problems. Firstly, returns have been under pressure for the last decade, making investments harder to finance. Secondly, the trend towards more customised shipping and more flexible operating procedures calls for ships which incorporate the latest technology in shipbuilding and thus for more investments in new ships.

These developments will make the future for EC shipowners more difficult.

The EC fleet has suffered in recent years from a lack of investment and difficulties

in remaining competitive on world markets. The proportion of new tonnage in the EC fleet is now lower than that of most of its competitors. The difference in age is particularly striking in comparison with the fleets of other OECD countries. While in the other OECD countries all fleets increased, only the container fleet of the Community grew, and by no more than three vessels in 1989/89.

The shares of 0-9 year old vessels decreased for all types and areas.

The lack of capital investment is partly attributable to the low freight rates for most types of trade. Freight rates for dry and liquid bulk cargoes have been extremely poor since 1981.

Tanker rates started a slow recovery in 1986, those for bulkers began to improve towards the end of 1987. The improvement continued through 1988 and 1989, albeit with fluctuations.

Owing to the slow growth of world trade in the mid-1980's, combined with a considerable build-up of the container fleet by such companies as Evergreen from Taiwan and the now closed down US Lines, many trade routes were over tonnaged, with the resulting downward pressure on freight rates. EC shipowners survived that period but lost their market shares.

They hardly figured in the Trans Pacific trade, but have succeeded in maintaining a fair share in the general cargo trades to and from Europe. Many EC shipowners have already ordered, or are about to order, new container tonnage in anticipation of further improvements, particularly in traffic to and from Eastern Europe.

EC shipping companies

Table 7 shows the principal shipping companies of the EC in terms of container capacity, of which P&O of the United Kingdom is by far the largest, with a turnover of about 5 500 million ECU; however, only 21% of this amount is made in the shipping division. In Denmark, the privately owned Maersk line controls about 73 000 TEU (over 5% of world container tonnage), making it the second largest operator of container ships after Evergreen.

Institutional features

Traditionally, there used to be a clear division between the deep-sea and short-sea trades; nowadays deep-sea and short-sea operators are often subsidiaries of the same transport group. Most companies have a strong national base. However, transnational cooperation has always flourished with the establishment of conferences, freight pools and consortia. Still, competition is lively and the EC policy aims at preserving open access to the industry. In the deep-sea liner trades, this has enabled many outsiders and forwarding companies, acting as NVOCCs (non-vessel owning common carriers), to challenge the established conference lines. Given the very long duration of the recession in shipping, EC owners, with their high manning costs under national flags, would have been forced out of most trade, if no cost-saving measures had been made by their governments such as invest-

Table 6
Fleet by major type and area, including share of 0 to 9 year-old-vessels, 1989 (1)

(Million dead weight ton (dwt))	Oil tankers total fleet	Share of 0-9 years (%)	Bulk carr. tot. fleet	Share of 0-9 years (%)	Containers tot.fleet (2)	Share of 0-9 years (%)
EC	39.7	18.2	26.8	41.4	347	42.9
Other OECD	46.4	25.5	25.2	68.3	307	54.7
State-trading	8.7	30.4	11.9	40.3	44	63.9
Open registry	103.7	17.3	60.8	40.3	294	68.9
Others	46.4	18.1	60.6	49.5	390	51.7
World	244.9	19.6	185.4	47.3	1382	52.9

(1) At 1/1 1989
(2) Expressed in 1 000 twenty-foot equivalent unit (TEU)
Source: ISL Bremen

Table 7
Major EC liner companies, 1988

Container capacity (Twenty-foot equivalent unit (TEU))

Company	Country	Owned	Chartered	(1)Ordered	Total number of employees
CMB	Belgique/België	23 500	11 500	-	4 100
EAC	Danmark	10 000	-	-	14 425
Maersk	Danmark	57 000	16 000	46 500	N/A
Hapag Lloyd	BR Deutschland	40 000	20 000	28 300	2 700
Hamburg Sud	BR Deutschland	13 000	-	8 000	2 250
CGM	France	30 000	-	5 400	9 500
SNCDV	France	15 000	-	-	5 700
Lloyd Triestino	Italia	7 000	4 500	14 500	N/A
Nedlloyd	Nederland	44 000	24 000	-	20 340
P & O	United Kingdom	43 000	-	7 200	55 000

(1) 6/89
Source: European Ship Owner Association, Annual Report 1988

Table 8
Forecasts

	1989	1990	91/90	92/91
World seaborne trade (1)	3 895	3 960	4%	4%
Fleet No. (2)	13 207	13 000	2%	2%
1000 GRT	60 473	60 000	2%	2%
Employment (1000)	145	139	-4%	-4%

(1) million tonnes
(2) EC 12
Source: NEI

ment allowances and government-supported research to advance automation and innovation. Some countries have tried to mitigate the owners' plight further by creating offshore registers or similar schemes which allow employment by foreigners at lower wages and of nationals at reduced levels of taxation, often in conjunction with permission to reduce crew levels. France has such an offshore register in Kerguelen, the Netherlands in the Dutch Antilles and the UK in Bermuda and the Isle of Man. In 1988 Denmark introduced a separate international register for Danish vessels, and Germany authorised a similar scheme in 1989. Those initiatives have now been followed with a proposal from the European Commission to introduce EUROS as a European register. Vessels already entered on national registers would also be registered in EUROS, in which case they would also be entitled to participate in the cabotage trades of Member States and in the shipments of EC food aid to developing countries.

State aids granted to shipowners in respect of EUROS vessels would be judged more favourably by the European Commission because they would be assumed to meet the stated objectives of Community shipping policy, inter alia employment of a large number of EC seafarers. The UK was the only member which reduced the level of aid to shipowners, by discounting the 100% free depreciation allowance.

There are variations among Member States regarding their approach to shipping; the Mediterranean countries are generally well placed in bulk shipping and (with the exception of Greece) rely strongly on State-ownership, particularly in the liner trades. The Northern Member States have a long tradition of privately owned liner companies which have often developed into diversified groups. Many of these companies have reduced their stake in the bulk trades. There are, particularly in the UK, still many independent or oil-company-controlled tanker and dry-bulk shipping companies, but most of their deep-sea tonnage is registered abroad. Governments have offered throughout the years incentives to owners to keep their vessels under national flags. Nevertheless an increasing number of vessels owned by EC nationals have been transferred to open registers. Initially these registers were used to avoid tax liability, but in the last few years cost reduction (particularly of manning costs) has been the main motive. The open registers are those of Liberia, Panama and Cyprus.

Outlook

European shipowners are becoming more confident not only on account of the gradual market recovery, but also because they expect that 'Europe 1992' will stimulate economic growth in the EC with a resulting increase in the Community's share in world trade. The four regulations adopted by the Council of Ministers at the end of 1986 regarding freedom to provide services, exemption of the anti-cartel rules for conferences, unfair pricing practices and free access to cargo may contribute to the removal of restrictions and to fairer pricing in the liner trades. Finally, the clearly expressed aim for the European Parliament, the Council of Ministers and the European Commission to work towards an efficient and competitive Community shipping industry should also enable EC shipowners to regain a major role in world shipping using ships registered in the Community. The proposed EUROS register should contribute to that end. EC seaborne trade is expected to grow at a steady rate in the next few years as a result of the positive development of the world economy.

The world fleet on the other hand will not increase but will remain at a stable tonnage of about 60 million GRT. The composition of the world fleet, however, is expected to change as many shipowners will find the economic conditions favourable enough to replace some older parts of their fleet. Employment will continue the trend it has followed for the last couple of years and decrease further at a yearly rate of 4%. As a result of the political and economic changes in Eastern Europe it is to be expected that those countries will allow more market-oriented activity, which will lead to freer and fairer competition with the other shipping countries. The union of the Federal Republic of Germany and the

German Democratic Republic will guarantee the latter country to act according to the Community rules in the near future.

The container trade will see major changes in the coming years as a result of the trend towards integrated transport companies, offering total distribution service from manufacturers to final customers. This will be possible by using the latest communication and information technologies, particularly electronic data interchange. Some European companies are actively engaged in extending European distribution networks to meet the new requirements for intermodal transport.

A large part of the tanker and bulker fleets will have to be renewed in the 1990's and doubts have already been expressed as to whether banks will be prepared to finance the huge investments involved. The availability of both finance and reputable shipowners may enable the EC to play again a larger role in bulk transport. The vessels involved will be of proven design (there being no new technology under consideration) but there may be a new tendency towards larger vessels.

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Air transport and airlines

The 1980's were the first decade in which the main driving force behind the air-transport industry was not technological progress, but structural change. Airline marketing and product distribution, finance and corporate structures evolved to reflect the mass markets which had grown out of earlier developments. However, some aspects of the airlines' operating environment failed to keep pace. The physical infrastructure - airports and airways - within which the industry operates, has come under increasing strain in the last three years and now appears inadequate to accommodate the substantial growth in demand expected until the end of the century. The same growth is also likely to generate resource problems, notably equipment and manpower and in particular pilots and ground engineers.

In the latter part of the 1980's, the impending single internal market increasingly conditioned strategic thinking. The EC's vision of liberalisation in Europe involves an interim period between a regulated, protected regime and a competition-based single market. Strategic actions - such as acquisitions and cooperation of the European airlines, are monitored very carefully.

The European airlines have responded quickly to the potential for increased inbound business and leisure travel to Eastern Europe. The cumulation of the effects of 1993 and the changes in Eastern Europe will generate a "mobility revolution" in which EC airlines are well placed to play an important role.

Table 1
AEA total scheduled traffic by carrier of Member States, 1989 (1)

	Passengers Number (mio)	Of which intra-European (mio)	Load factor (%)	Revenue (mio ECU)	Freight (tonne-km) (mio)	Revenue (mio ECU)	Total revenue (mio ECU)
Aer Lingus	3.8	2.9	72.8	396.9	117.8	25.2	422.1
Air France	16.1	7.7	70.5	3 358.9	3 261.5	359.5	3 718.4
Alitalia	10.3	4.4	64.0	1 831.5	1 107.3	275.7	2 107.2
British Airways	23.2	11.3	71.1	5 587.6	2 183.3	494.7	6 082.3
Iberia	14.9	5.4	69.6	1 999.8	724.6	192.2	2 192.0
KLM	6.5	3.2	71.4	1 901.2	1 990.8	676.4	2 577.6
Lufthansa	18.8	8.5	66.2	4 355.3	3 839.8	734.3	5 089.6
Luxair	0.3	0.3	52.5	31.1	0.5	1.3	32.4
Olympic Airways	6.6	1.6	68.9	568.6	103.1	34.9	603.5
Sabena	2.8	1.8	64.8	698.1	660.6	171.0	869.1
TAP Air Portugal	2.8	1.5	67.9	496.6	159.9	61.7	558.3
UTA	0.8	0.0	68.5	425.8	528.2	110.3	536.1
Total	106.9	48.6		21 651.4	14 677.4	3 137.2	24 788.6

(1) The data refer to both domestic and world-wide international traffic.
Source: AEA Statistical Yearbook 1990

Sector definition

Air transport and airlines include units exclusively or primarily engaged in the transport of passengers and goods by air on scheduled or chartered services. Under the same heading come helicopter and air-taxi services, local pleasure-flight operators, etc. The town offices of airline companies are also included. Not included, however, are units exclusively or primarily engaged in aerial advertising (NACE 838), aerial spraying (NACE 01) or aerial photography (NACE 983) and not transporting passengers or goods.

Air traffic (excluding military air movements) is divided between the commercial sector and general aviation. General aviation, which will not be considered here, includes private planes, air taxis and aerial surveying flights. Although the share of general aviation activity in total flights may still be considerable, it is increasingly restricted as traffic density increases and capacity limits are put under stress.

Commercial aviation is divided into passenger travel and air freight, which includes regular air freight, courier transport and air mail.

Table 2
Ratio-analysis for total scheduled traffic

	Passenger revenue/ Passenger carried (ECU)	Freight revenue/(1) tonne-km	Passenger revenue/ Total revenue (in %)
Aer Lingus	104.4	0.2	94.0
Air France	208.6	0.1	90.3
Alitalia	177.8	0.2	86.9
British Airways	240.8	0.2	91.9
Iberia	134.2	0.3	91.2
KLM	292.5	0.3	73.4
Lufthansa	231.7	0.2	85.6
Luxair	103.7	2.6	96.0
Olympic Airways	86.2	0.3	94.2
Sabena	249.3	0.3	80.3
TAP Air Portugal	177.4	0.4	88.9
UTA	532.3	0.2	79.4
Total	202.5	0.2	87.3

(1) Only freight carried on passengers services.
Source: AEA

Current situation

The demand for air transport is strong, but growth is jeopardised by restrictions on the supply side, notably infrastructural capacity and resources of manpower and equipment. The competitive environment is rapidly changing. Firstly, the EC liberalisation policy is expected to increase competition among air carriers. Secondly, growing congestion in air travel makes long-distance rail travel more competitive, especially with the creation of high-speed train networks.

Production

In 1989, the total number of passengers carried by the airlines mentioned in table 1 increased by 5.8%. Total passenger revenue grew by 6% in 1989. The growth figure for air freight in tonne-kilometres was even higher: 7.6%, in accordance with the growth trend prevailing since 1985. In revenues there was a drop of more than 4% for air freight. Air France, Sabena and UTA suffered losses in freight revenue. The downward trend of freight revenues is

reflected in the lower overall freight yield per tonne-kilometre. From 0.265 ECU per tonne-km in 1988, the yield fell to 0.21 ECU per tonne-km in 1989. KLM, British Airways, Lufthansa and Iberia saw their freight revenues increase, but with them, too, growth in tonne-km exceeded that in revenue. Despite the losses in freight revenue, overall revenues increased by more than 9%. A notable feature of the 1989 airfreight results was the resurgence of traffic on all-cargo aircraft, up 22% for long-haul services. This took the proportion of traffic by this mode up to 28.5% of the total - the highest rate in ten years. Revenues from passenger transport accounted for more than 85% of total revenue, an indication of the relatively minor role of freight transport. Table 1 shows recent AEA data for the most important Member State airlines. Four airlines - Air France, British Airways, Iberia and Lufthansa - absorb 68% of total passengers carried for scheduled flights. Since its merger with BEA and BOAC, British Airways has been number one in international passenger flights, Lufthansa and Air France ranking second and third, respectively. Almost half of total passengers carried on scheduled flights have another Member State as their destination.

The ratings are different for freight. Lufthansa - the German airline - is by far the largest air freight transporter, accounting for 3 839 million tonne-kilometres in 1989. British Airways, second runner up after Air France, registered 2 183 million tonne-kilometres. Remarkable is the fourth position of KLM at almost 2 000 million tonne-kilometres in 1989, stressing the importance of Schiphol-Amsterdam airport as a centre of air freight. This relatively strong position of the Dutch airline in air freight is reflected in the lowest passenger revenue related to total revenue, despite a high revenue per passenger carried (see table 2).

Table 3
IATA member's ranking: Top 20, 1989
Scheduled passenger-kms flown (total)

Rank	Airline	Passenger-kms (million)
1	Aeroflot	227 728
2	American Airlines	118 252
3	United Airlines	111 993
4	Continental Airlines	62 402
5	British Airways	60 758
6	TWA	56 937
7	Japan Air Lines	53 182
8	Pan American	47 249
9	USAir	40 445
10	Air France	36 734
11	Lufthansa	36 133
12	All Nippon	28 657
13	Qantas Airways	26 177
14	KLM	24 931
15	Air Canada	23 917
16	Iberia	21 035
17	Alitalia	20 814
18	Eastern Airlines	18 655
19	Korean Air	17 923
20	Canadian Airlines International	17 521

Source: IATA Yearbook 1989

Among the top 20 IATA member airlines, measured in scheduled passenger-kms flown, the largest Community airline - British Airways - ranked fifth. Air France and Lufthansa followed in tenth and eleventh position, respectively. Ranking of IATA members: Top 20, 1989

Most EC non-scheduled operators are concentrated in the United Kingdom. The latest information shows a strong decrease in the number of passengers carried by two major charter airlines, Dan-Air (by 23%) and Air Europe (by 22%).

In the Federal Republic of Germany, Aero-Lloyd, Condor, LTU and Hapag-Lloyd were the largest charter companies, together carrying more than 10 million passengers.

Trade

Table 5 gives intra-EC passenger movements by scheduled airlines. The United Kingdom, France and Germany are the main countries, in origin as well as in destination. Not surprisingly, the most intensive air passenger traffic took place between the United Kingdom and the rest of the Member States. The air traffic between France and the United Kingdom amounted to almost 2 million passengers in 1989, a number that will certainly be affected by the opening of the Channel tunnel in 1993. For air traffic in general, but especially for that between France and its neighbouring countries, the question arises of what will happen when the TGV-infrastructure is extended to these neighbour countries.

Routes

EC airlines continued to expand their worldwide networks in 1989, with increased frequencies on established routes,

Table 4
Air transport
Non-scheduled operators

Airline	Member State	Passengers carried (thousand)	Fleet	Personnel	Report year
Aero-Lloyd	D	1 376	15	620	1989
Air 2 000	UK	860	4	275	1988
Air Europe	UK	2 028	36	2 055	1989
Air Europa	E	1 953	9	702	1988
Air UK (leisure)	UK	226	3	N/A	1988
Britannia A/W	UK	6 100	42	3 150	1988
Caledonian A/W	UK	2 320	N/A	450	1987
Conair	DK	731	3	415	1988
Condor	D	3 134	26	1 427	1988
Dan-Air	UK	4 471	46	4 135	1989
DLT	D	551	24	486	1988
Euralair	F	404	4	N/A	1988
Germania	D	504	N/A	150	1987
Hapag-Lloyd	D	2 295	13	1 115	1988
Hispania	E	N/A	N/A	250	1987
LTE	E	351	2	171	1988
LTU	D	3 555	14	1 611	1988
LTU-Sud	D	424	3	N/A	1988
Maersk Air	DK	1 291	13	N/A	1988
Martinair	NL	1 183	9	1 270	1988
Minerve	F	750	11	615	1988
Monarch Airline	UK	2 468	14	900	1988
Orion Airways	UK	N/A	N/A	687	1987
Sobelair	B	701	5	110	1988
Spanair	E	455	4	N/A	1988
Sterling	DK	1 981	18	1 384	1988
TEA	B	N/A	N/A	115	1988
Transavia	NL	1 100	13	607	1988

Source: Air Transport World, 06/89; ICAO; IATA Yearbook 1989

individual carriers extending their geographical coverage, and a number of cities served for the first time. On the busiest European routes, the general trend was to maintain frequency levels while increasing aircraft size, to achieve capacity increases within the constraints of a congested infrastructure. European regional services maintained their rate of growth relative to the increase in trunkline services. Developments included a significant expansion of Sabena operations from Brussels to secondary points, while Air France increased by four the destinations available from Mulhouse.

On the North Atlantic, the New York area was further served by Air France and UTA, whose operations opened up nine new gateways in the French provinces. In Canada, destinations added were Halifax and Ottawa, both by KLM. Alitalia's US product will be enhanced by the addition of Miami, and Newark continues to attract new service; British Airways, Lufthansa and TAP all included it in their summer 1990 schedules. Baltimore was introduced as a US destination by KLM.

The Far East, and particularly the Japanese market, continues to be a key area of development. In 1990 Olympic started serving Tokyo, while Sabena transfered its transpolar service to a more direct trans-Siberian routing. The Europe-Japan route will shortly overtake Canada to become the second-largest long-haul market after the US for AEA carriers. The market suffers nonetheless from severe capacity restraint, largely due to the heavily congested airports of Tokyo and Osaka. A new offshore Osaka airport will probably offer some relief.

As far as Eastern Europe is concerned, the developments in six Comecon coun-

Table 5
Number of passengers by Member State flown on AEA airlines, 1989 (1000's)

From / To	B	DK	D	GR	E	F	IRL	I	L	NL	P	UK	Total
Belgique/België		83	245	67	187	236	36	219	4	84	72	470	1 703
Danmark	84		336	39	91	165	20	110	0	132	29	306	1 312
BR Deutschland	246	331		280	521	952	64	815	0	383	142	1 684	5 418
Hellas	71	42	310		58	143	0	279	0	104	7	239	1 253
España	193	97	545	58		673	11	510	5	213	187	895	3 387
France	239	180	996	137	651		99	1 003	4	360	235	1 984	5 888
Ireland	29	20	66	0	11	99		19		52	7	1 449	1 752
Italia	219	106	819	266	510	1 014	19		3	244	86	838	4 124
Luxembourg	5	0	0	0	6	4	0	3			10	22	50
Nederland	84	130	388	96	210	349	51	251	0		71	711	2 341
Portugal	70	32	153	7	189	226	7	83	9	69		257	1 102
United Kingdom	422	309	1 706	238	896	1 851	1 465	850	25	717	251		8 730
Total	1 662	1 330	5 564	1 188	3 330	5 712	1 772	4 142	50	2 358	1 097	8 855	37 060

Source: AEA

Table 6
Synoptic view of development of intra-Community air services operated by Community airlines (number)

From	Routes			With multiple designation			With Community fifth freedom		
	1989	1988	1987	1989	1988	1987	1989	1988	1987
Belgique/België	54	44	45	2	1	1	2	1	0
Danmark	42	38	37	2	0	0	1	1	0
BR Deutschland	189	184	173	9	7	7	4	3	0
Hellas	37	36	39	1	0	0	0	0	0
España	126	118	108	5	4	2	0	0	0
France	168	154	153	3	3	2	3	0	1
Italia	131	110	99	2	1	1	1	0	0
Ireland	44	42	43	5	3	2	2	0	0
Luxembourg	20	17	15	0	0	0	2	2	1
Nederland	64	69	65	6	7	7	1	1	0
Portugal	48	42	33	1	2	2	0	0	0
United Kingdom	195	186	178	28	24	24	6	2	0
Total	1 118	1 040	988	64	52	48	22	10	2

Source: OAG (Official Airlines Guide)

tries will loosen the constraints on the local travel market, although it will be a long time before the purely numerical of these markets is translated into a significant impact on the overall demand for air transport in Europe. For the immediate future most EC airlines are planning to upgrade their Eastern Europe product with new destinations and increased frequencies on existing routes.

Table 6 demonstrates the growth in intra-EC air services during the last three years. While the growth of intra-EC routes was 5% in 1988 against 1987, in 1989 the number increased by 7.5% against 1988.

The Community fifth freedom relates to freedom to pick up passengers in an EC Member State other than the state of registration of the carrier and transport them to another EC country. The number of intra-EC air services operated according to the fifth freedom is still small, but rapidly growing.

AEA activity as far as the intra-EC air-freight is concerned, as distinct from short-haul traffic fed to intercontinental services, concentrates on maintaining the market share in the face of strong competition from integrated express operators. These carriers, the largest of which are all non-European companies, have established themselves in the small-package sector which, through a process of de facto deregulation, has allowed them almost total operational freedom within the EC. Their current policy is to expand into flag carriers' traditional markets of more general cargo at greater weights.

Employment

Total employment with the main Community airlines increased by 5%. All major airlines recorded growth, British Airways ranking first as employer of more than 50 000 people, followed by Lufthansa and Air France. As productivity figures are observed, an overall increase can be noted of 4% against 1988.

Investment

In 1989 a substantial increase of 77 aircraft joined the EC major airlines' fleet, taking the total inventory for 12 airlines up to 847 units. Notable additions were the first B747-400s, operated by British Airways, KLM, Lufthansa and UTA, and the 400 series of B737 with Air Lingus and KLM. The Fokker 50 fleet was boosted by

Table 7
Air transport
Employment, 1989 (1)

(1000 ECU)	Employees	Fleet	Aircraft on order	Employees/ airplane	Revenue/ employee(2)
Aer Lingus	6 612	29	14	228	60.0
Air France	39 111	111	15	352	85.9
Alitalia	19 832	83	100	239	92.4
British Airways	50 959	211	63	242	109.6
Iberia	29 001	86	62	337	69.0
KLM	25 000	69	41	362	76.0
Lufthansa	43 565	147	27	296	100.0
Luxair	1 070	8	5	134	29.1
Olympic Airways	12 167	38	0	320	46.7
Sabena	7 340	28	1	262	95.1
TAP Air Portugal	9 711	26	7	374	51.1
UTA	6 787	11	8	617	62.7
Total	251 155	847	343	297	86.2

(1) The data refer to both domestic and world-wide international traffic.
(2) Revenues on freight services excluded.
Source: AEA Statistical Yearbook 1990

Table 8
Airlines operating scheduled intra-Community services by Member State, 1990

Member States	Carrier	Code	Services to Member State
Belgique/België	Sabena	SN	All
Danmark	SAS	SK	Not L
	Sun-Air	EZ	D
	Newair	WA	UK
	Sterling Airways	NB	L
	Cimber Air	QI	UK, D, F
	Maersk Air	DM	UK, D
BR Deutschland	Lufthansa	LH	Not L
	Hanse Express	HX	B, NL, UK
	Nurnberger Flugdienst	NS	B, I, NL, F
	Naske Air	HC	F
	Air Bremen	HR	B, DK, UK, NL
	RFG-Regionalflug	VG	F, UK
	Aero-Lloyd	YP	UK, F
Hellas	Olympic Airways	OA	B, DK, D, F, I, NL, E, UK
España	Iberia	IB	All
France	Air France	AF	Not L
	Flandre Air	IX	D
	Air Vendee	VM	B, UK, NL, E
	Air Littoral	FU	I, E, UK, NL
	Brit Air	DB	UK, IRL
	TAT-Export	IO	UK, E
	Air Exel	VJ	B
	Novajet	NL	D
	Alsair	LJ	NL
	Aigle Azur	ZI	UK
Ireland	Aer Lingus	EI	B, DK, D, F, I, NL, E, UK
	Ryanair	FR	D, UK
Italia	Alitalia	AZ	Not IRL
	Alisarda	IG	D, F
	Ati	BM	UK, F, D, GR
	Transavio	TD	F
	Avianova	RD	D, E
Luxembourg	Luxair	LG	DK, D, GR, F, I, NL, P, E , UK
Nederland	KLM	KL	Not IRL & L
	NLM Dutch Airlines	HN	B, D, UK
	Netherlines bv	WU	F, L, UK, D
	Transavia	HV	UK
	Flexair	VV	UK
	Dynamic Air	QG	F
Portugal	TAP Air Portugal	TP	All
United Kingdom	British Airways	BA	All
	Air UK	UK	B, F, NL
	Birmingham Executive Airways	VB	DK, D, I, NL
	Dan-Air Services	DA	F, IRL, NL, P, E
	British Midland	BD	F, NL, IRL, B
	Brymon Airways	BC	IRL, F, NL
	Suckling Airways	CB	NL
	Britannia Airways	BY	P, E, GR
	Monarch Airlines	ZB	E
	Air Europe	AE	B, D, F, P, E, DK, I, NL
	Eurocity Express	II	F, NL, B
	GB Air	GT	P
	Capital Airlines	BZ	IRL
	Loganair	LC	IRL, B
	Region Airways	JA	NL, B, F
	National Commuter Airways	NK	B

Source: OAG (Official Airlines Guide)

deliveries to Aer Lingus and Luxair. At the end of 1989 the number of aircrafts in order was 323, which meant an increase of 24% against 1988. Eighty of these, mainly the short-haul types, were destined for Alitalia.

Industry structure

Table 8 lists all the airlines in the Community that were operating intra-EC scheduled services during summer 1989. There are 54 airlines on this list of which 19 are British. Perhaps more significantly, there are five Member States where the intra-EC services are operated only by flag carriers. Table 9 shows ownership structures; it indicates government participation in the flag carriers and participation by flag carriers in daughter airline companies. Five flag carriers, Aer Lingus, Air France, Olympic Airways, TAP and Iberia are 100% government owned. Table 10 gives an indication of the market structure of each Member State in terms of number and size of firms.

Industry cooperation

With liberalisation looming, most airlines try to expand their markets. When bilateral agreements and protection of flag-carriers falls away, domestic markets will no longer suffice to provide a large enough basis for competitive operation. Most major airlines are presently seeking some kind of cooperation or joint venture with other major airlines and to acquire smaller and regional airlines to serve as a feeder for their major routes. Table 11 gives an overview of airline equity alliances. Another area of cooperation are computer reservation systems (CRS). The CRS enables travel agents to provide a vastly improved global reservation service. They will be able to call up all flights on any particular route displayed in the order of priority called for by the European Civil Aviation Conference. The new ECAC ground rules provide a significant increase in protection for the passenger. Additional features of the CRS are price information and immediate confirmation of reservations. An extensive CRS system also provides a

valuable statistical database, enabling the airlines greater flexibility and efficiency in the provision of promotional fares.

In mid-1987 European Airlines started two separate systems, Galileo and Amadeus as a reaction to US systems (Sabre: AA, Apollo: UA, Worldspan: TWA, Northwest and Delta). Amadeus was set up by Air France, Iberia, Lufthansa and SAS. Since then eight more airlines partners with shareholding have joined: Adria Airways, Air Inter, Braathens, SAFE, Emirates, Finnair, Icelandair, JAT and Linjeflyg. Galileo was set up by KLM, BA and Swissair and is later joined by Alitalia, Austrian Airlines Air Lingus, TAP, Olympic Airways and Sabena. As well as competing, the systems are now increasingly interactive. Galil o's founder KLM has become a service partner in Amadeus. Galileo has purchased a share in the Covia Company that operates Apollo, Covia has purchased a share in Galileo. Recently Amadeus reached an agreement with Sabre to establish an exchange of technology.

Table 9
Ownership of European Community airlines, 1989

Airline	Member State	Stakes in the company	(%)
Aer Lingus	IRL	Government	100.0
Air France	F	Government	99.4
Alitalia	I	Government	77.6
British Airways	UK	Private	100.0
Iberia	E	Government	99.8
KLM	NL	Government	36.7
		Private	63.3
Lufthansa	D	Government	65.0
Luxair	L	Government	20.9
		Private	79.1
Olympic Airways	GR	Government	100.0
Sabena	B	Government	54.7
		Private	45.3
SAS	DK	Government	50.0
	(+ Sweden & Norway; ratio 2:3:2)		
		Private	50.0
TAP Air Portugal	P	Government	100.0
UTA	F	Air France	54.6
		Private	45.4

Source: Various, including Interavia, 10/89; Air Transport World Airline Business.

Congestion

The problem of airport and airspace congestion, which first manifested itself in 1987, worsened again in 1989, when 23.8% of international departures in Europe were delayed by more than 15 minutes. Changes to airlines' operating patterns involving additional cover aircraft and extended flight-sector and turnaround times have - at considerable cost - reduced the cumulative impact of delay. At the same time, improvements have been achieved in identified problem areas, largely through coordinating action initiated by Eurocontrol's European Coordination Team.

Increasing congestion at a large and growing number of Europe's major airports also imposes a heavy burden on the industry. Overcrowded terminal facilities inconvenience the traveller; inadequate runway capacity, often the result of operating inefficiencies, adds to the problems of delay. As regards the development of substantial new airport capacity, the airlines must accept the unlikelihood of major developments in more than isolated cases. Environmental constraints not only on new airport projects, but also on new runways at existing airports, will severely limit such development.

EC policy

As post-1992 Europe begins to take shape, so does the framework within which Community air transport will operate. The policies currently being implemented are the second phase of a three-stage process, the final part of which will be the package of measures which completes the single market for air transport.

The liberalisation process has centred around three areas of policy: capacity, pricing and market access. In the case of capacity, the task has been to progress from a bilateral regime in which the product offered between two states is determined by negotiation, and increased according to mutually agreed principles, to a system of unilateral capacity increase without restriction. The transfer is being achieved by a phased approach to permissible capacity imbalance; currently, carriers of one state may add seats in a country-pair market up to 60% of capacity. With the adoption of the second package, the rate at which flexibility is introduced will accelerate, although in practical terms, the current level represents virtual de-restriction in most bilateral markets.

Liberalisation of tariffs is pursued through a policy of fare zones, expressed in percentages of the normal economy fare within which tariff applications will be automatically approved. In the period up to 1993, the policy is one of gradual simplification and extension of the process; thereafter, fare approval will be automatic unless the states at both ends of the route object. In the case of market ac-

Table 10
Structure and diversity of Community airlines, 1989

Member State	National airlines	Subsidiary or association of	Other airlines (>250 employees)	Small airlines (<250 employees)
Belgique/België	Sabena	Sobelair		Air Belgium
				Trans European A/W
Danmark	(SAS)	Danair	Conair	Cimber Air
			Maersk Air	Sun-Air
			Sterling A/W	Newair
BR Deutschland	Lufthansa	Condor	DLT	Germania
		German Cargo	Hapag-Lloyd	Hamburg Airlines
			LTU	Delta Air Regional
			Aero-Lloyd	Air Bremen
			NFD	Sudavia
			LTE	Naske Air
Hellas	Olympic A/W			
España	Iberia	Aviaco	Air Europa	LTE
		Viva	Spanair	Euskal Air
France	Air France	Air Charter	T.A.T.	Air Jet
	UTA	Aeromaritime	Minerve	Air Limousin
		Air Inter	Air Liberte	Air Vendee
			Air Littoral	Corse Air Int.
			Brit Air	Flandre Air
			Euralair	
Ireland	Aer Lingus	Aer Turas	Ryan Air	
Italia	Alitalia	ATI	Alisarda	Avianova
		Aermediterranea		Transavio
Luxembourg	Luxair	Cargolux		
Nederland	KLM	NLM	Air Holland	Flexair
		Martinair		Dynamic Air
		Transavia		
		Netherlines		
Portugal	TAP	Air Atlantis	SATA	
United Kingdom	British A/W	Caledonian A/W	Air Europe	Air Bridge
			Air UK	British Air Ferries
			Britannia A/W	Birmingham European
			British Midland	London City A/W
			Dan-Air	Capital Airlines
			Monarch AL	Suckling A/W
			Novair	
			Virgin At. A/W	
			Air 2 000	
			Brymon A/W	
			Loganair	

Source: Various, including Interavia, 10/89; Air Transport World Airline Business.

cess, mechanisms have been devised to phase in increased flexibility in advance of the single market.

For various reasons of practical necessity, it is important that airlines retain the freedom to consult and cooperate.

Tariff coordination, airport scheduling and computer reservation systems are areas in which joint consultation between airlines is vital to the effective operation of the air transport system.

The Community is also working on safeguards against anti-competitive practices.

Strategic actions - like acquisitions and cooperation - of the European airlines will be watched very carefully. The trend towards collaboration and partnerships among established airlines may especially involve partial financial participation or be limited to commercial co-operation agreements. In 1990 for example, the Commission was involved in the 20-percent stakes in Sabena World Airlines which KLM and British Airways intended to take and imposed conditions to protect competition in France threatened by the Air France/UTA/Air Inter restructuring.

Outlook

Given the functional relationship between demand for air travel, on the one hand, and economic growth and real prices on the other hand, events in late 1990 have severely affected the airlines' medium-term outlook. Fuel-related fare increases, undertaken in an unfavourable economic environment, will jeopardise continued growth. In the longer term a potential for growth is foreseen though this may be limited by infrastructural inadequacy and continual upward pressure on costs.

The extension of the European high-speed

Table 11
Airline equity alliances

Airline	% ownership in other airlines	%
Air France	Air Charter	80
	Air Guadeloupe	45
	Air Inter	36.5
	Air Madagascar	3.5
	Air Mauritius	12.8
	Cameroon	25
	EuroBerlin	51
	MEA	28
	Royal Air Maroc	4
	Tunis Air	5.6
	TAT	35
	UTA (1)	54.6
Alitalia	ATI	100
British Airways	Sabena (1)	20
	United (1)	15
	Caledonian Airways	100
	GB Airways	49
	Brymon Airways	40
Iberia	Viva	100
	Aviaco	67
KLM	Air UK	14.9
	Martinair	29
	Netherlines	100
	NLM Cityhopper	100
	Northwest (2)	10
	Transavia (1)	40
	Sabena (1)	20
Lufthansa	Cargolux	24.5
	DLT	52
	EuroBerlin	49
	Condor	100
	DLT	52
	Cargolux	24.5
	Euro Berlin	49.0
	Interflug	26.0
	Hapag Lloyd	10.0
	German Cargo Services	100.0
Luxair	Luxair Commuter	100
	Cargolux	25
Sabena	Sobelair	100
SAS	Airlines of Britain	24.9
	Danair	57
	Greenlandair	50
	Linjeflyg	50
	Texas Air	9.9
	Wideroe's	22
UTA	Air Inter	35.8
TAP	Air Atlantis	65

(1) Pending EC approval
(2) actually has 20% of capital
Sources: Interavia/Air Transport World Airline Business

rail network and also the opening of the Channel tunnel in 1993 will entail changes in travel patterns and some of the airlines' traditional market will be lost. At the same time, new opportunities for the airlines will arise. To seize them demands foresight and planning, and the efficient allocation of public resources.

Table 12
Outlook
Air transport

	1989	1990	91/90	92/91
Passengers carried (000's)	107	115	7%	6%
Freight (mio. tonne-km)	14 677	15 998	8%	7%

Source: IATA/NEI

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Airports

Throughout the 1980s and in particular since 1983 strong growth has been recorded in the volume of airport traffic in terms of passengers and freight flights. This period of high growth, far exceeding projections, has led to justifiable concern about the adequacy of the infrastructure to handle increasing traffic.

The future of air travel in the EC will, in many respects, follow trends set in the past two decades. A combination of factors, including increasing real incomes in the EC, trends towards liberalisation, and greater mobility of businesses and people will continue to increase the number of passengers and flights.

Sector definition

Supporting services to air transport (airports and airfields) includes units exclusively or primarily engaged in the activities essential to air transport, without transporting passengers or goods. Classified in this group, are units exclusively or primarily engaged in the operation of civil airports and airfields (public and private), radio beacons and radar stations. Also included are units taking care of air routes and air traffic control.

Distinguished by provider the following activities can be found at airports:

- ❖ Airport operator
  - – Administration
  - – Crash/fire/rescue
- ❖ Tenants
  - – Duty free shops
  - – Restaurants/base
  - – Public shower/sleep facilities
  - – Rental car agencies
  - – Banking/financial services
  - – Business/secretarial services
  - – Fixed base operators for commercial and general aviation (incl. fuelling and flight kitchens)
  - – Freight forwarders/consolidators
  - – On-airport hotels
- ❖ Airlines
  - – Ticketing
  - – Baggage/cargo handling
  - – Ramp services
  - – Aeronautical support services, maintenance and overhaul
- ❖ Contract services
  - – Maintenance/snow removal
  - – Janitorial
  - – Law enforcement
  - – Medical services
  - – Parking lot management
- ❖ Government

- Border control formalities
- Customs

Current situation

Airport capacity will be a major factor in the continued economic growth and integration expected in the EC. Coupled with the completion of the internal market, the potential effects of economic deregulation, the changing political climate in Eastern Europe and the increase in disposable income, demand for commercial air traffic is likely to grow at a very high rate.

The EC is not alone in facing the airport problems entailed by this growth. All other countries with robust commercial aviation markets (for instance USA, Japan, Australia and Canada) are faced with similar problems and are struggling with the political, environmental and investment issues involved.

Passenger and freight traffic

Tables 1 and 2, giving recent data on the top 20 airports, rank them by their importance in terms of the number of passengers checked in and the volume of freight forwarded. The average growth rates since 1983 are 8.7% for passengers and 8.2% for freight. A remarkable development in the top ten was the negative growth of the airport of Palma de Majorca.

The four high-ranked Community airports, London, Paris, Frankfurt and Amsterdam, also have a very high percentage of international traffic. Given their geographical proximity, these airports compete with each other, particularly for air freight.

Eleven airports handle more than 100 000 tonnes of freight a year: Frankfurt ranks first in freight but third in passengers. Brussels is also more important in terms of freight movements, ranking fifth in 1989, than in passengers checked in, for which it ranks only sixteenth.

Table 3 gives an overview of passengers handled by EC airports, with a division to scheduled and non-scheduled passengers, the share which originated in or was destined for Europe and the share of domestic passengers. The share of intra-European non-scheduled passengers at 31% is significantly larger than the share of 22% for scheduled passengers. This reflects the charters for the tourist market, which are predominantly directed at intra-European destinations. For scheduled passengers Amsterdam and London are the most important airports for intra-European passenger movements. The average share of domestic passengers is 21%, where France, Italy and Spain see the largest numbers of domestic passengers.

In addition to their primary aeronautical functions, airports engage in other commercial activities, for example the lease of property, the renting of plant equipment or facilities, or the provision of business services. Table 4 gives an estimate of the impact of direct commercial aviation-related activities.

Employment

Table 4 gives the airport employment by Member State. Employment is clearly in line with transport density, the UK, France

Table 1
Top 20 ranked Community airports, 1983-89 (1)

	Airport	Member State	1989	1989/88 (%)	1988	1983	Average annual growth 1983-89
1	London total	UK	62.8	4.7	59.8	39.6	8.0
	London Heathrow	UK	39.9	5.4	37.9	26.7	6.9
	London Gatwick	UK	21.3	2.1	20.9	12.5	9.3
	London Stansted	UK	1.4	24.3	1.1	0.4	23.2
2	Paris total	F	45.0	10.5	40.7	29.7	7.2
	Paris Orly	F	24.3	8.4	22.4	16.3	6.9
	Paris CDG	F	20.7	12.9	18.3	13.4	7.5
3	Frankfurt	D	26.7	5.9	25.2	17.0	7.8
4	Rome (Fiumicino)	I	16.1	7.8	14.9	11.4	5.9
5	Amsterdam	NL	15.7	4.5	15.0	9.7	8.4
6	Madrid	E	14.5	6.4	13.7	10.2	6.0
7	Copenhagen	DK	12.0	3.3	11.6	8.3	6.3
8	Palma Majorca	E	11.6	-1.5	11.8	8.7	4.9
9	Dusseldorf	D	10.8	4.0	10.4	7.1	7.2
10	Athens (2)	GR	10.7	N/A	10.7	9.1	2.7
11	Manchester	UK	10.7	7.0	10.0	5.1	13.1
12	Milan total	I	10.5	2.8	10.2	7.4	6.0
	Milan Linate	I	8.4	0.7	8.3	6.1	5.5
	Milan Malpensa	I	2.1	11.9	1.9	1.3	8.3
13	Munich	D	10.5	5.3	10.0	6.1	9.5
14	Barcelona	E	8.5	12.2	7.5	5.6	7.2
15	Dublin	IRL	7.2	13.2	6.4	2.6	18.5
16	Brussels	B	7.1	10.9	6.4	5.0	6.0
17	Las Palmas	E	6.4	0.3	6.3	4.2	7.3
18	Hamburg	D	6.3	5.9	6.0	4.3	6.6
19	Tenerife	E	5.6	3.1	5.4	3.8	6.7
20	Nice	F	5.6	10.5	5.0	3.8	6.7
24	Lisbon	P	4.8	11.0	4.3	3.3	6.4
50	Luxembourg	L	0.9	-5.6	1.0	0.7	4.3
	Total		310.0	6.1	292.3	206.6	7.0

(1) Million passengers
(2) 1988 figures used again for 1989
Source: ICAA

Table 2
Major Community airport freight movements, 1983-89 (1)

	Airport	Member State	1989	1989/88 (%)	1988	1983	Average annual growth 1983-89
1	Frankfurt	D	1 083	8	1 007	628	9.5
2	London total	UK	932	8.0	863	598	7.7
	London Heathrow	UK	692	7.3	645	470	6.7
	London Gatwick	UK	210	-1.0	194	110	11.4
	London Stansted	UK	30	25.0	24	18	8.9
3	Paris total	F	833	2.3	814	662	3.9
	Paris CDG	F	585	1.4	577	498	2.7
	Paris Orly	F	248	4.6	237	164	7.1
4	Amsterdam	NL	583	1.4	575	370	7.9
5	Brussels	B	243	3.8	234	122	12.2
6	Rome (Fiumicino)	I	227	12.4	202	162	5.8
7	Madrid	E	208	16.2	179	154	5.1
8	Milan total	I	144	1.4	142	96	7.0
	Milan Malpensa	I	75	0.0	75	45	8.9
	Milan Linate	I	69	3.0	67	51	5.2
9	Cologne	D	149	38.0	108	54	18.4
10	Copenhagen	DK	127	-18.1	155	141	-1.7
11	Luxembourg	L	127	11.4	114	62	12.7
12	Athens (2)	GR	93	N/A	93	75	3.7
13	Lisbon	P	74	13.8	65	49	7.1
14	Manchester	UK	65	-15.6	77	24	18.1
15	Barcelona	E	61	8.9	56	51	3.0
16	Maastricht	B	55	5.1	52	N/A	N/A
17	Munich	D	52	10.6	47	30	9.6
18	Dusseldorf	D	44	4.8	42	31	6.0
19	Dublin	IRL	43	0.0	43	40	1.2
20	Hamburg	D	38	5.9	36	26	6.5
	Total		5 181	6	4 904	3 407	7.2

(1) 1000 tonnes
(2) 1988 figures used again for 1989
Source: ICAA

and Germany having the highest number of commercial aviation related employees. Table 5 shows the numbers of non-airline employees at the main Community airports. The airports of Paris, Frankfurt and London had the highest number of non-airline employees in 1988. Table 6 shows the division of employment at eight major Community airports. Frankfurt had the highest number of airport operator employees while London and Amsterdam have the highest number of others employed at the airport.

Table 4
Direct impact of commercial aviation-related activities 1988 (1)

(mio. ECU)	Employment	Expenditures
Belgique/België	9 480	1 433
Danmark	22 900	721
BR Deutschland	73 417	9 752
Hellas	16 220	856
España	49 780	3 593
France	77 760	8 418
Ireland	8 626	994
Italia	40 323	3 261
Luxembourg	1 360	N/A
Nederland	29 972	3 533
Portugal	11 371	776
United Kingdom	85 071	10 043
EC 12	426 280	43 378

(1) Airline expenditures, airport and air traffic controle salaries only.
Source:SRI International

Congestion

There used to be only limited competition among airports for shares of the market. With the liberalisation of air transport, competition is intensifying. Airports that used to have a monopoly situation for a certain area find that they have to compete with airports in other Member States which can also supply their area, and also compete against a growing number of small regional airfields. In addition, airports are in many cases hampered by capacity limits both on the ground and in the air, the latter in the shape of traffic-control constraints.

The capacity limit of individual airports is determined by several factors. It cannot be set as an upper limit on the number of passengers or the volume of freight but can only be approximately determined.

The number of flights is limited by the layout of runways as well as by the number of gates in the terminal and the positions on the apron. At many airports the capacity is limited further by restrictions on night flights. The number of passengers is limited by the connection between the airport and the traffic network (roads and railways), the number of check-in counters and the check-in capacity of each counter (electronic data-processing infrastructure).

The volume of freight that can be forwarded, besides being limited physically by the relevant infrastructure, is restricted by the frequency and duration of closures due to bad weather and the extent to which the airport is used by night. A freight hub, indispensable if a high volume is to be achieved, cannot be installed unless these major problems are solved.

Table 3
Major EC airports indicating scheduled and non-scheduled passengers, 1989 (1)

	Airport	Member State	Scheduled	% Europe (3)	Non-Scheduled	% Europe (3)	Total	% domestic
1	London total	UK	51.0	49	11.1	77	62.1	14
	London Heathrow	UK	39.6	51	0.0		39.6	18
	London Gatwick	UK	11.0	41	10.1	77	21.2	6
	London Stansted	UK	0.3	67	1.0	70	1.3	8
2	Paris total	F	41.9	33	2.5	40	44.4	38
	Paris Orly	F	22.3	12	1.8	44	21.1	71
	Paris CDG	F	19.6	58	0.7	43	20.3	10
3	Frankfurt	D	23.2	40	2.6	65	25.9	24
4	Rome	I	15.4	N/A	0.6	N/A	16.0	47
5	Amsterdam	NL	12.6	65	2.7	81	15.3	1
6	Madrid	E	13.6	N/A	0.6	N/A	14.2	54
7	Copenhagen	DK	2.5	N/A	9.1	N/A	11.6	22
8	Palma Majorca	E	2.7	N/A	8.8	N/A	11.5	27
9	Athens (2)	G	N/A	N/A	N/A	N/A	10.7	N/A
10	Dusseldorf	D	5.3	53	5.1	82	10.4	23
11	Milan total	I	9.3	48	0.8	75	10.1	41
	Milan Linate	I	8.3	51	0.0	N/A	8.3	48
	Milan Malpensa	I	1.0	20	0.8	75	1.8	11
12	Manchester	UK	N/A	N/A	N/A	N/A	10.1	18
13	Munich	D	7.4	42	2.6	73	10.0	39
14	Barcelona	E	7.6	N/A	0.6	N/A	8.1	63
15	Brussels (2)	B	N/A	N/A	N/A	N/A	6.4	N/A
16	Las Palmas	E	2.4	N/A	3.9	N/A	6.3	43
17	Tenerife	E	1.9	N/A	4.3	N/A	6.3	38
18	Hamburg	D	4.8	31	1.3	92	6.1	52
19	Berlin	D	5.1	10	0.7	100	5.9	80
20	Nice	F	5.1	30	0.3	30	5.4	67

(1) Million passengers
(2) 1987 figures
(3) Europe is EC12 + EFTA + COMECON + Turkey + Malta + Cyprus + Albenia
Source: ICAA

Costs of congestion

In a recent study by SRI it was estimated that curtailed growth arising from system-wide airspace and airport capacity constraints could grow to cost EC economies over 7 billion ECU annually by the year 2000. SRI forecasts that the greatest adverse impacts will arise in France, Germany, Greece, Italy, Spain and the UK.

Annual losses and the cost of remedying their causes are identified in Table 7.

The losses to local and national economies incurred in a single year of inadequate capacity exceed the required 10-year investment to remedy the deficiency in most cases.

The investment would be paid back by general economic gains in the case of public financing.

Table 6
Division of employment at major airports,1988

Airport	Airport operator's employees	Others employed at the airport	Total employment
London-Heathrow	4 036	46 924	50 960
Frankfurt-Main	7 658	32 822	40 480
London-Gatwick	1 392	15 480	16 872
Amsterdam-Schiphol	1 857	34 894	36 751
Dusseldorf	1 689	5 700	7 389
Munich-Riem	1 581	5 940	7 521
Milan-Linate	2 569	1 186	3 755
Lisbon	650	1 280	1 930

Source:SRI International

Airport authorities

In the EC, the legal structure of airport authorities varies widely from one Member State to another. There are six main types of airport statutes:

- Public establishments such as Aéroports de Paris (3 major airports, 11 airfields) and the Copenhagen Airport Authority (Kastrup and Roskilde);
- Airports owned and managed by joint stock companies such as the Frankfurt airport (42.5% by the State of Hesse, 25.8% by the city of Frankfurt, and 31.7% by the Federal Government) and the Schiphol Airport Authority (76 per cent by the State, 20% by the city of Amsterdam, and 4% by the city of Rotterdam);
- Public airports managed as concessions by public institutions like the Chamber of Commerce and Industry of Marseille (the

commercial airport of Marseille-Marignane and the airfield of Aix-les-Mille) and the Chamber of Commerce and Industry of Nice (Nice-Côte d'Azur and the airfield of Cannes-Mandelieu);

- ❖ Public airports managed as concessions by private companies; the Rome airports Leonardo da Vinci, Fiumicino and Ciampino, for instance, are managed as concessions by a private company (major shareholder Alitalia has a 46% equity interest; the other shareholders are Italsat 43%, IRI 10%, and the Chamber of Commerce and Industry of Rome 1%);
- ❖ Airports owned and managed by a private company; for instance, the BAA plc (British Airport Authority public limited company) manages London's three commercial airports (Heathrow, Gatwick, Stansted) and four airports in Scotland (Glasgow, Edinburgh, Aberdeen, Prestwick). The BAA was a public establishment until 1987, when it entered the private sector. Other examples are the Manchester International Airport Authority (shareholders: the city of Manchester and the nine districts in the County of Greater Manchester) and the Milan airports of Malpensa and Linate (managed by SEA);
- ❖ State-operated airports managed by a national airport authority, such as:
  - Spanish airports (authority under the direct control of the Ministry of Transport, Tourism and Communications);
  - Greek airports (Civil Aviation Authority under the direct control of the Ministry of Transport and Communications);
  - Belgian airports (Regie des Voies Aeriennes);
  - the Lisbon airport and the six other airports in Portugal (ANA);
  - the Irish airports of Dublin, Cork and Shannon (Aer Rianta under the direct authority of the Ministry of Communications).

Table 7
Costs of congestion and investments needed

	Annual quantifiable losses (year 2000) (mio.ECU)	Solution	Cost of solution through year 2000 (mio.ECU)	Payback period years
Athens airport	54	Best-in-class enhancements	100 - 150	2 - 3
Barcelona airport	135	Best-in-class enhancements	50 - 75	<1
Madrid airport	388	Best-in-class enhancements (to yr 2000)	50 - 75	<1
		New runway (following year 2000)	70 - 430	<2
Dusseldorf airport	28	Best-in-class enhancements	50-75	<2

Source: German Airspace Users Association; SRI International

Airport safety

Although flying is one of the safest means of transportation, in 1989, 1 450 people died in 51 commercial jetairliner accidents, excluding hijackings and sabotage. The average number of deaths over the past decade has been about 600 a year. Last years' rise may be the result of the growth of air movements. Airport safety is particularly important as take off and landings account for about 70% of accidents.

With the growth of air traffic and liberalisation, it will be increasingly difficult to com-

Table 5
Estimated non-airline airport direct employment 1988

Country	Airport	Passengers (thousands)	Non-airline employees
Belgique/België	Brussels-National	6 875	2 480
Danmark	Copenhagen-Kastrup	11 262	8 000
BR Deutschland	Frankfurt-Main	24 344	15 300
	Dusseldorf	10 022	3 380
	Munich-Riem	9 509	3 160
	Hamburg	5 731	2 060
	Berlin-Tegel	5 589	2 010
Hellas	Athens	N/A	3 670
España	Madrid-Barajas	13 243	4 770
	Palma de Mallorca	11 712	4 220
	Barcelona	7 234	2 600
	Las Palmas-Gran Canaria	6 202	2 230
	Malaga	5 358	1 930
	Tenerife	5 308	1 910
France	Paris-Orly	22 206	10 370
	Paris-Charles de Gaulle	17 887	6 620
	Nice-Cote d'Azur	4 916	1 770
	Marseille-Marignane	4 297	1 550
Ireland	Dublin	N/A	1 580
Italia	Rome-Fiumicino	14 950	5 380
	Milan-Linate	8 275	2 940
Portugal	Lisbon	2 433	876
United Kingdom	London-Heathrow	37 510	16 140
	London-Gatwick	20 745	2 790
	Manchester	9 504	3 420
Nederland	Amsterdam-Schiphol	14 482	3 710

Source: SRI International

Table 8
Outlook for EC airports

	1989	1990	91/90	92/91
Passengers (mio.) (1)	310	330	6%	7%
Freight (mio.tonnes) (1)	5.2	5.5	9%	9%
Employment (1000) (2)	442	464	4%	5%

(1) Top 20 Community airports
(2) All EC airports
Source: NEI

bine free movement and safety against terrorist attacks. Airport, security and police authorities now recognise the need for an international and strict approach to the problem.

Since most airports were built before the rise of terrorist attacks, the majority of them will have to be rearranged. The prevailing objective being prevention, it is estimated that it will take the better part of 10 years to do so. This will have to be combined with an expansion of security staff and an international approach to criminal law and prosecution.

Outlook

Six airports are already operating at full capacity and drawing excess demand. These are Frankfurt, Heathrow, Gatwick, Munich-Riem, Milan-Linate and Dusseldorf. At present, expansion of capacity is created through technical improvement of the existing infrastructure, which leads to a further increase in capacity utilisation.

Only one airport is currently under construction: Munich. Paris, Brussels, Madrid, Barcelona, Milan and Rome are anticipating expansion of runway capacity. Other airports anticipate a growing number of travellers and air traffic by extending their terminal capacity and enhancing runway capacity by building new control towers, new aprons, taxiways, carparks, etc.

Traffic demand will soar as a result of 1992, deregulation, and developments in Eastern Europe will also boost traffic demand over and above the normal increase corresponding to GDP growth. Forecasts are conditional on the infrastructural constraints.

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Public transport

At present public transportation is subject to great importance.

Its function of support to regional development has become more and more important, as well as its role played in helping to decongest cities choked by private traffic.

New solutions have been envisaged to face the problem of financing urban and regional transport, and high investments have been planned to extend and adapt its structures, in order to improve the quality of life in urban centres. In its "Green Paper on the Urban Environment", the Commission itself has presented new proposals to improve the efficiency of public transport.

Sector definition

NACE 721 consists of city underground, surface and elevated railways, tramways, regular bus and motor coach services.

Regular urban and regional public transport services refer to transportation within cities and large conurbations, also comprising suburban transport which follow scheduled routes and a fixed timetable.

Public transport is thus defined as transportation by bus, rail, or other conveyance, either publicly or privately owned, which provides the public with a general or special service (not including school buses, charter and sightseeing services) on a regular and continuing basis.

Current situation

Bus service is by far the most widespread mode in urban and suburban EC public transport. Buses account for about 60% of passenger trips, 59% of the total vehicle fleet and about 90% of the systems.

The amount of operators in the motor bus service indicates a large number of small operators, particulary private.

Commuter rail, the largest of the urban rail systems, follows far behind bus services with 18% of passenger trips and 28% of vehicle stocks. Underground railway with only 8% of the total vehicle stock accounts for more than 13% of total passenger trips.

The number of vehicle km also shows an intensive use of the underground railway. This indicates the high service intensity that the underground railway can provide in large cities such as Paris or London.

Light rail is not of great importance in the EC. It accounts for only 7% of passenger trips, with annual per capita trip rates of just over 6%.

Finally, trolley buses are the least signifi-

Table 1
Public transport in the EC, 1988-89
(urban and suburban)

Number of systems		1 304	
of which:	Bus	1 172	
	Trolley bus	28	
	Light rail (1)	39	
	Metro	22	
	Commuter rail (2)	43	
Route length			
of which:	Bus	N/A	
	Trolley bus	869	km
	Light rail	3 601	km
	Metro	1 593	km
	Commuter rail (4)	11 200	km
Number of trips (annual)		28 454	mio
of which:	Bus (3)	16 990	mio
	Trolley bus	502	mio
	Light rail	2 068	mio
	Metro	3 794	mio
	Commuter rail (4)	5 100	mio
Number of vehicles (year)		172 039	
of which:	Bus	101 829	
	Trolley bus	1 703	
	Light rail	5 906	
	Metro	13 601	
	Commuter rail (4)	49 000	
Vehicle km (4)			
of which:	Bus	N/A	
	Trolley bus	74	mio
	Light rail	288	mio
	Metro	2 320	mio
	Commuter rail	N/A	

(1) LRT systems only,trams in use or heritage tramways for tourist purposes not included.
(2) Only includes commuter rail systems with more than 3 lines and frequent traffic.
(3) passengers carried
(4) Estimate
Source: D. Bayliss/DG VII/Jane's/UITP

cant public transport mode in the EC, with annual average trip rates of less than 2 per capita.

Urban road transport systems

The bus system Public transport buses operate on fixed routes and a fixed schedule. They vary in capacity from minibuses (20 to 35 places) to articulated buses (up to 130 places).

They have the ability to operate in nearly all streets, arterials and freeways. Buses can be distinguished from coaches in that the latter are usually more comfortable and do not allow standing place.

The bus system represents more than half of public transport traffic and accounts for about a quarter of the total EC bus and coach fleet. Table 2 shows the situation of urban and suburban public bus transportation in the EC.

Trolley bus systems Trolley buses are propelled by an electric engine and obtain power from two overhead wires along their route. They are basically used for the same services as regular urban buses.

Advantages of this transport mode include higher riding quality and excellent environmental features (low noise and no exhaust). Disadvantages are higher levels of investment and more complex operations than buses.

Trolley buses are the least significant public transport mode in the Community with annual average trip rates of 1.5 per capita. There are 182 trolleybus systems in the world.

The largest systems are to be found in the USSR with 80 systems spread out throughout the Republics. North America (USA and Canada) have 9 systems, while Western Europe accounts for about 45 of the total world trolley systems. There are 28 systems in the EC including two under construction (Bologna and Bradford), while one is being used only for experimental purposes (Doncaster, UK).

Urban rail systems

Urban rail systems are defined here as rail systems within cities and their suburbs. It encompasses underground railway, light rails, tramway systems, and commuter rail systems.

A clear distinction is to be made between these systems: Commuter rail is part of mainline rail infrastructure, while trams, light rails and underground railway are an urban public transport category.

Urban rail systems in the EC represent a third of public transport traffic and about half of the public transport vehicle stock. Table 3 shows the existing urban rail systems throughout the Community.

Underground railway systems The overall importance of underground railway is relatively small with 11.7 annual per capita trips.

However, their role in many medium size and large cities is very important. Four new underground railway systems were opened in the 1980's and another four are under construction. Extensions are planned in practically all 22 existing systems.

Light rail systems Light rail (LTR) is a tracked, electrically-driven, local means of transport, which can be developed step by step from a modern tramway to a means of transport running in tunnels or above the ground. Automated systems were opened in Lille and London's Docklands during the 1980's and new manually driven systems in Grenoble, Nantes and Utrecht. Altogether there are 39 light rail systems in the EC.

Commuter rail Commuter rail, the second most widespread mode of public transport is present in most EC cities, as shown earlier in table 3. Many cities have given a renewed impulse to commuter rail services, in order to cope with passenger traffic in major conurbations. For example, the Spanish 'Cercanias' commuter rail operations currently serve 500 000 customers daily, which represents 75% of the network's passengers carried by the State railways RENFE.

Financing

Generally, public transport services are unprofitable and depend on public funding for their maintenance. Public subsidies are usually directed to cover operating cost deficits, but are sometimes also used to fund investment.

Compensation or subsidies with respect to concessionary fares for the elderly, children, students or the handicapped are also granted.

The percentage of operating costs covered by fares varies from one country to another. An UITP country survey showed, for example, that in Ireland fares cover approximately 85% of operating costs, while in Germany about half of the costs are financed by fare revenue.

In Italy the percentage of operating costs to be paid by fares is fixed every three years by the government. In large conurbations the rate varies from 27% (Naples) to 34% (Rome).

In Germany and the UK the operator is given the lead in defining or finding ways of meeting their deficits.

There are no legal provisions in Germany obliging the federal government, the Länder, or local governments to contribute directly to operating deficits. The deficit should be made up by the undertaking, either by means of an agreement with its suppliers, or through its associates, usually the local authorities. In the UK, operators must indicate in a competitive tendering process the level of subsidy they need to run the specified service. Contracts are awarded to the most efficient one which requires the lowest subsidy.

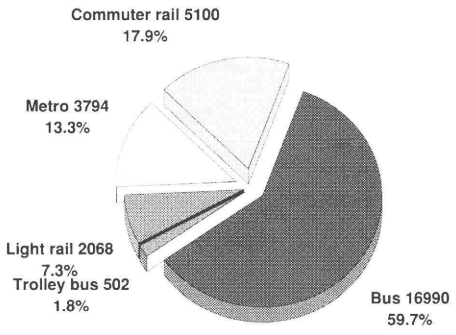
In certain countries alternative revenue sources (transport levy in France, indirect taxation) are sought with a view to relieve the burden on the State or local authority budgets.

Table 2
Urban & suburban public bus transport in the EC, 1988

	Number of companies	Staff	Vehicles	Mio. passengers carried
Belgique/België	6	8 720	1 276	169.9
Danmark	5	N/A	441	80.5
BR Deutschland	(4) 155	90 126	20 538	3 236
Hellas	(3) 31	(1) 15887	(1) 3451	704.3
España (4)	7	13841	3871	1 033
France	(1) 162	N/A	(1) 12247	1 343
Ireland	1	(2) 7352	(5) 2266	186.6
Italia	(6) 291	(1) 61660	(1) 16164	(1) 3 822
Luxembourg (7)	1	N/A	124	15.2
Nederland (8)	9	25 900	1 348	635
Portugal (9)		29 941	1 803	797
United Kingdom (11)	504	113 500	38 300	4 968

(1) 1986
(2) 1987
(3) 1989
(4) Refers to communal companies only.
(5) Urban + interurban vehicles
(6) Of which 150 on urban and regional services
(7) Luxembourg city only
(8) Staff data for 1987 for urban and regional companies bus, tram and metro except vehicle fleet which refers only to buses
(9) Figures relate only to urban transport, except staff which for staff figures which incl. suburban transport
(10) Refers only to 7 large Spanish cities (Madrid, Barcelona, Bilbao, Sevilla Malaga, Valencia and Zaragoza) and does not include private operators
(11) Estimate for staff, vehicles and passenger carried from offical figures Data for 88/89
Source: DG VII; UITP/Jane's 1990; UK National Statistics

Figure 1
Passenger traffic in the EC, 1988-89. Annual number of trips (in millions and %)



Source: D. Bayliss/DG VII/Jane's/UITP

Table 3
Urban rail systems in the EC

	City	Metro	Tram & light rail	Commuter/ Rail (1)		City	Metro	Tram & light rail	Commuter/ Rail (1)
BELGIQUE/	ANTWERPEN		(2) x	x	BR	RHEIN-RUHR	x		x
BELGIË	BRUSSELS	x	(2) x	x	DEUTSCHLAND	STUTTGART		(2) x	x
	CHARLEROI		(2) x	x		ULM		x	
	GHENT		x	x		WIESDBADEN			x
FRANCE	BORDEAUX	UC				WUPPERTAL			x
	GRENOBLE		(3) x			WÜRZBURG		(2) x	
	LILLE-ROUBAIX	x	x	x	HELLAS	ATHENS	x		x
	TOURCOING				ITALIA	BOLOGNA			x
	LYON	x		x		FLORENCE			x
	MARSEILLE	x	x	x		GENOVA		UC	x
	NANTES		(3) x			MILAN	x	(2) x	x
	PARIS	x	UC	x		NAPLES	UC	(4) x	x
	SAINT ETIENNE		(2) x			ROME	x	(2) x	x
	STRASBOURG					TURIN		(2) x	x
	TOULOUSE	UC		x		VENICE			x
BR	AACHEN			x	NEDERLAND	AMSTERDAM	x	(2) x	x
DEUTSCHLAND	AUGSBURG		x	x		DEN HAAG		(2) x	x
	BERLIN	x				ROTTERDAM	x		x
	BIELEFELD		(2) x			UTRECHT		(3) x	x
	BOCHUM-		(2) x		PORTUGAL	LISBOA	x	x	x
	GELSENKIRCHEN					PORTO		(4) x	x
	BONN		x		ESPAÑA	BARCELONA	x	(T) x	x
	BRAUNSCHWEIG		(2) x			BILBAO	UC		x
	BREMEN		x	x		MADRID	x		x
	DARMSTADT		x			MALAGA			x
	DRESDEN	UC		x		SOLLER		(T) x	
	DORTMUND		(2) x			VALENCIA		(3) x	x
	DUISBURG		(2) x	x	UK	ABERDEEN			x
	DÜSSELDORF		(2) x	x		BELFAST			x
	ESSEN		(2) x	x		BIRMINGHAM			x
	FRANKFURT-AM-MAIN	x	(2) x	x		BLACKPOOL		x	
	FREIBURG-BREISGAU		(2) x			BRISTOL			x
	HAMBURG	x		x		CARDIFF			x
	HANNOVER		(2) x	x		DOUGLAS		(T) x	
	HEIDELBERG		x			EDINBURGH			x
	KARLSRUHE		(2) x	x		GLASGOW	x		x
	KASSEL		(2) x			LEEDS/BRADFORD			x
	KÖLN		(2) x	x		LIVERPOOL			x
	KREFELD		(2) x	x		LONDON	x	(3) x	x
	LUDWIGSHAFEN		x			MANCHESTER		UC	x
	MAINZ		(2) x			NEWCASTLE-UPON	x	(4) x	
	MANNHEIM		x			TYNE			
	MÜLHEIM-RUHR		(2) x			NOTTINGHAM			x
	MUNCHEN	x	x			SHEFFIELD			x
	NÜRNBERG-FÜRTH	x	x	x		STOKE-ON-TRENT			x

(1) List of systems in major EC cities not comprehensive
(2) Indicates a system extending or extended (includes subways)
(3) Indicates a system built new since 1978
(4) Indicates a system with no light rail features
(x) In operation
(UC) Indicates under construction or in design
(T) Indicates a heritage tramway operated for tourist purposes
Source: Jane's/UITP 1990

Investment

Given the difficult financial situation of many undertakings, there has been a tendency to keep investment expenditure at minimum levels just to meet basic equipment replacement.

There have been however, a number of developments mainly in urban rail systems as described later in this monograph.

Buses have an average life of around 12 years, while coaches have less due to the need to keep higher standards of passenger comfort. Investment tends to be a highly irregular phenomenon often affected by changes in regulations, taxes and grants as well as normal market forces. For example in the UK, investment in buses has been strongly affected over the last decade by the withdrawal of new bus grants, deregulation, privatisation and the subsequent industrial restructuring. Expenditure on new vehicles in Western Europe is currently running at about 4 000 mollion ECU a year with replacement rates ranging from 2% (Belgium and the UK) to over 8% (Netherlands). These variations probably reflect different replacement cycles rather than longer term trends. However the overall replacement rate of a little over 5% suggests an ageing/declining fleet.

The main investments in trolley buses are in the renewal and modernisation of existing systems which is sufficient to keep about a dozen vehicle and component manufacturers in operation in the European market. Purchase volumes in the range of 100 to 150 vehicles a year mean a rather small domestic market.

Total investment in trolleybus services has been estimated at around 39 million ECU a year.

Total investment in urban rail (underground railway and light rail) through the 1990's is expected to be around 31 000 million ECU with the largest programmes in France, Germany, the UK and Italy, as shown in Table 4. Extensions are planned in almost all the 22 EC underground railway systems.

For example, in London the 1 500 million ECU Jubilee Line extension has been authorised and the Government is committed to a new 1 500 million ECU cross-London line to relieve congestion on the existing network.

A programme for expanding the existing underground railway and commuter rail system amounting 2 700 million ECU is also underway.

Paris plans further extensions to the RER (Reseau Express Regionale) and a new automated underground railway line (Meteor) which will cost almost 1 000 million ECU and relieve congestion on one of the RER lines, which were opened in the 1970's. Expenditure in extensions is forecast to run at 153 million ECU annually. There are also plans for an orbital underground railway around the edge of the main built up area.

Four underground railway systems are currently under construction (Naples, Strasbourg, Toulouse and Bilbao). Much of the investment in underground railway systems will be directed to modernisation of current equipment and infrastructure.

At present, new light rail systems are under construction in Manchester, Genoa and Paris. Plans for new systems for Strasbourg and Rouen in France are well advanced, as are those in Birmingham, Sheffield and Bristol in the UK and Utrecht in the Netherlands. In the last few years there have been substantial improvements in the quality and styling of European light rail vehicles. Important is the extensive upgrading and re-equipment of existing systems especially in the German cities.

The most ambitious rail project in Europe is the Docklands system with the first phase in operation, in total costing 1 000 million ECU. This is being built to support Europe's largest urban renewal project and is expected to carry 70 million passenger a year by the mid-1990s. Although large compared with other light rail schemes, the Docklands project is probably the clearest illustration of the inter-relationship between the light rail renaissance and urban renewal programmes.

Table 4
Total investment in underground railway & light rail transit, 1990-2000

(Annual Rates)	(mio ECU)
Belgique/België	88 - 130
Danmark	23 - 34
BR Deutschland	461
Hellas	N/A
España	107 - 146
France	538 - 615
Ireland	N/A
Italia	654 - 960
Luxembourg	N/A
Nederland	20 - 58
Portugal	12 - 19
United Kingdom	500 - 654

Source: DTI Study/Bayliss

Internal market

The effects of the single market are likely to concentrate on the input side. The most important effect will be found in vehicles input. At present, there is a marked tendency for local procurement which can be seen as a counterpart to locally financed subsidies.

Even though there is a general distinction to be made between suppliers of rail equipment and suppliers of buses and coaches, for both industries each country has its own supply industry, which is circumscribed to supplying national markets or non-EC markets. Since a number of suppliers are under public ownership or have long-established relationships with national undertakings, the question about the possibility of fair EC-wide competition in the case of international tenders is raised.

The progressive consolidation of the supplying industry of buses and urban and regional rail vehicles opens the way for fiercer competition from international bidders. The role of non-EC competitors should not be underestimated either. For instance, Japanese and Canadian competitors have been strong bidders in underground railway and LTR tenders in Milan. Without knowing as yet, technical, economic and financial (e.g. threshold) requirements of future EC new public procurement procedures in public transport, definite conclusions can not be drawn at this stage.

Environmental protection and the role of public transport

The growth of private car traffic and traffic congestion is worsening the quality of life of European citizens and endangering the

environment beyond reasonable limits. The diagnosis of the environmental and traffic congestion problems in cities and large combustions is well underway. Various measures to reduce the pollution and traffic problems caused mainly by private transport, have been the subject of EC legislation, which have had relative success in terms of their applicability and implementation at Member State level. The EC Member States and the EC institutions are aware of these problems and there is almost unanimous agreement that public transport services and infrastructure should be increased and improved. In its 'Green Paper on the Urban Environment', the EC Commission has suggested action on the urban environment along the following lines:

- Encourage city authorities to incorporate decisions about the coordinated future development of public transport and road construction into their plans for land use and transportation;
- Encourage innovation of the use of public transport and the environmental management of urban traffic by contributing to the cost of pilot projects and monitoring their effects. Research programmes should attach high priority to environmental elements and should include innovative public transport, environmental-friendly vehicles and advanced traffic management systems;
- Encourage the Community-wide exchange of information in urban traffic management to maximise the benefits of a wide range of experience;
- Consider in detail, possibly by financing pilot projects, the potential for using economic instruments such as road pricing to help solve the environmental problems generated by urban traffic.

Outlook

The renewed attention for public transportation due to traffic congestion and environmental considerations is likely to lead to further investments in infrastructure and capacity. These improvements along with the rising price of urban car transportation and city parking will make public transportation more competitive for urban transport compared with the automobile. For suburban and regional transportation the future performance will depend on the integration of public urban transport systems with other modes of transport. Connections with railways and airports will increase in importance.

The marked trend towards increasing individualism and the 'culture of the self' is being incorporated into the new marketing and manufacturing plans of public transport authorities, operators and manufacturers. Thus, attracting customers for public transport today involves action on both the demand and supply side.

Some issues are:

- The service to be provided must incorporate high levels of comfort, service-reliability and flexibility. Economic considerations, although important, do not seem to be the crucial element for the consumer when choosing which transport mode to use. British Rail Inter-city, for example, has been able to make profits with a high-priced service, but based on comfort and punctuality;
- There is a need for more multi-modal transport infrastructure, such as park-and-ride, as well as passenger information facilities;
- The least polluting public transport vehicles should be used. The present increase and further expected investment in urban rail and current research work aimed at reducing exhaust pollution from buses confirms this trend;
- Other actions include governmental initiatives to limit access to city centres (eg. Milan) to other than public transport vehicles or pay-tolls for the right to enter to those centres;
- Finally, public authorities and operators have been carrying out campaigns throughout Europe to promote public transport by linking it with the need for environmental protection.

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