

Indicator fact sheet

TERM 2003 13b EEA 17 — Modal split in freight transport

The share of road freight transport increased during the 1991–2000 period, whereas the modal share of short-sea shipping remained more or less stable. Both had a share of 41 % in 2000. The modal shares of rail, inland waterways and oil pipelines continue to decrease, thereby moving away from the objective of stabilising the share of alternative transport modes (CTP).



NB: Shares based on tonne-km.

Figure 1b: Shares of road freight transport in road, rail and inland waterways, since data on oil pipelines and short sea shipping are not available on country level. The lack of data on short sea shipping has a significant impact on this graph since in a number of countries short sea shipping is an important means of freight transport.

Source: Eurostat, 2003.



Figure 2: Modal split in freight transport by country in 2000, including road, rail and inland shipping

Results and assessment

Policy relevance

The European Commission has set itself the following objectives to achieve sustainable (reduction of congestion and other negative side effects) transport:

- Bring *back* the shares of alternative modes (rail, inland waterways, short sea shipping and oil pipelines) to their 1998 levels (see Figure 1) by 2010 (CTP);
- Shift in transport use from road to rail, and water transport (SDS).

Policy context:

The need for action with respect to the split among transport modes was first acknowledged in the Transport and Environment (T&E) integration strategy (European Council, 1999) that was adopted by the Council of Ministers in Helsinki. In its sustainable development strategy (SDS) (European Commission, 2001a), endorsed by the European Council meeting in Gothenburg (European Council, 2001), the EU has set itself the objective to shift freight from road to alternative modes.

In the review of the T&E integration strategy in 2001 and 2002 (European Council 2001; European Council, 2002), the Council states that the modal split should remain stable for at least the next 10 years, even with further traffic growth.

In the White Paper on the Common Transport Policy (CTP) 'European transport policy for 2010: Time to decide' (European Commission, 2001b), the Commission proposes 60 or so measures to reach this objective. The proposed action programme aims mainly at stabilising the modal shares at 1998 levels by 2010.

Revitalise alternative modes

By adopting the new (second) railway package (European Commission, 2002a) the Commission aims to achieve fuller integration of European railway services (better interoperability) by greater and faster opening of the rail freight market. It proposes to open up the entire rail freight market by 2006 (instead of 2008 as originally foreseen by the first railway package). This opening up not only refers to international services (as agreed upon in the first railway package) but also to national services, thus facilitating cabotage.

In the field of shipping, documentary procedures for ships that call at EU ports have been simplified (European Commission, 2001c). Additionally, the Commissions strategy for promoting short-sea shipping has been prolonged by a Council resolution in February 2000. The market for inland navigation has been completely opened as of 1 January 2000, by entering into force of Council Directive 96/752. As concerns intermodal services, the Commission policy aims 'to support the efficient door-to-door movement of goods, using two or more modes of transport, in an integrated transport chain' (European Commission, 2002b). To this end, the Commission recently proposed the 'New Marco Polo Programme' allocating EUR 115 million from 2003 to 2007 to help the transport and logistics industry 'turning intermodality into reality' (European Commission, 2002c). The final budget agreed was however EUR 75 million.

In the long run, short-sea shipping, railways and inland waterways should also benefit from road congestion, provided that these services become more easily accessible through improved multi-modal transport systems. A general feeling is that a modal shift from road to rail or water is favourable for the environment. However this is not always the case (see environmental context).

Make targeted investments

With the revision of the trans-European network (TEN-T) guidelines, the Commission aims to optimise the trans-European network capacity by giving investment priority to the creation of a dedicated rail freight network, including port connections (European Commission, 2001d). The Commission also proposes to increase the maximum Community funding to 'crucial' projects from 10 to 20 % in order to speed up their realisation by attracting public and private investments, since only 20 % of the projects scheduled by 2010 have been completed in 2001. Such projects might include rail projects crossing natural barriers like the Pyrenees and the Alps and various-mode projects in frontier regions of the candidate countries. A high level group (one representative from each Member State or Accession Country), chaired by Karel van Miert have identified, from proposals made by each State, a limited number of priority projects on the major corridors which will carry the heavy flows of freight traffic between the States in the enlarged Union. The group has made its recommendations in June 2003. The group has identified a set of new priority projects, in addition to the Essen projects. Amongst them are waterway corridors, motorways of the sea and (freight) railway lines. Following upon this the Commission will draft a proposal for a decision revising the 1996 TEN-T guidelines in the end of 2003 (European Commission, 2002b),

Introduce fair and efficient pricing mechanisms

Fair and efficient pricing should encourage usage of the best performing modes of transport (see also TERM 2002 26 EU — Internalisation of external costs). The Commission proposes to allocate the additional revenues raised, which are generally higher than the costs of infrastructure, to new rail infrastructure.

Environmental context:

The relevance of the modal split policy in freight transport comes from differences in environmental performance (resource consumption, GHG emissions, pollutant and noise emissions, land consumption, accidents etc.) of transport modes. These differences are becoming increasingly smaller, which makes it more and more difficult to determine the direct and future overall environmental effects of modal shifting. The total environmental effect of modal shifting can in fact only be determined on a case-by-case basis, where local circumstances and specific local environmental effects can be taken into account (e.g. transport in urban areas or through sensitive areas).

The magnitude of environmental effects from modal shifting is limited, as modal shift is only eligible for small market segments. Opportunities for modal shifting depend amongst others on the type of goods lifted — e.g. perishable goods or bulk goods — and the transport requirements associated to these goods.

Assessment (1):

⁽¹⁾ Data on short sea shipping is estimated from 1997 (by the Energy and Transport DG) on and data on oil pipelines from 1999 on. For these modes, data is not available on the country level. Therefore, short sea shipping and oil pipeline transport are not included in assessments on the country level.

Overall EU picture

The share of road transport has increased during the 1991–2000 period from 40 to 43 %. Since 1998, however, this decreases in favour of short-sea shipping. The shares of rail, inland shipping and oil pipelines all decreased during the nineties. The share of rail decreased from 10.2 to 8.3 %, the share of inland shipping has decreased from 4.8 % in 1991 to 4.2 % in 2000. The share of oil pipelines has decreased form 3.5 to 3.0 %.

The objective of stabilising the shares of rail, inland waterways, short sea shipping and oil pipelines, outlined in the common transport policy (CTP) and to make for a shift of balance from 2010 onwards has not been achieved as can be seen from figure 1a. The modal split shifted away from most of these alternative modes (aside from the estimated transport share of short-sea shipping). The share of road freight transport has grown mainly at the expense of rail freight transport. However, also oil pipelines and inland waterway transport had to give up part of their share.

Road

The share of road is the highest in Iceland, Greece and Ireland, all above 90 % in 2000. Austria, the Netherlands, Sweden, Belgium, and Germany have the lowest share of road transport in total freight transport, between 60 and 70 % (see Figure 2). For the Netherlands and Germany, this is due to the extensive use of inland shipping. For Sweden, the share of road is low since the use of rail in freight transport is extensive.

The share of road has increased in most EU countries during the nineties. It only decreased in Belgium (-6%) and Portugal (-3%). In Belgium, the decrease in the share of road transport goes together with an increase in the share of inland shipping. In Portugal, a strong growth in rail took place at the expense of road transport. The greatest shift towards road can be observed in Germany, mainly at the cost of rail and in Luxembourg, at the cost of inland shipping and rail. The growths of the modal shares of road were 13 and 17% respectively in these countries during the 1991–2000 period.

Rail

Rail freight transport played the greatest role in Austria and Sweden in 2000. In that year, the share of rail freight transport was around 40 % in these countries. Rail only had a share of 2 to 4 % in Greece, Denmark and Ireland. Ireland (– 64 %) and Luxembourg (– 53 %) show the greatest decline in the share of rail transport. Inland shipping and rail do not play a role of significance in Irish freight transport — it is dominated by road in this country. However, Ireland is one of the countries with a high share of short sea shipping (see Table 1). Portugal, Finland and the Netherlands are the only countries that show an increase in the modal share of rail.

Inland shipping

Inland shipping is only important in the Netherlands (36 %), Belgium (15 %), Germany (16 %), Austria (5 %) and France (4 %), see Table 2. In recent years, inland shipping grew in Belgium, while the share of road decreased. Its share grew from 11 % in 1991 to 15 % in 2000. However, in all other countries, the share of inland shipping declined. The greatest decline of inland shipping has been reported in France (– 38 %) and Luxembourg (– 46 %), but both countries play a very minor role in European inland shipping.

Multi-modal freight transport

The promotion and development of intermodal transport is an important element of the common transport policy as pointed out above. The market share of intermodal transport is hard to measure because of a lack of relevant statistics. Some figures for combined transport estimate a share of 9 % of the total freight market (including rail, inland waterways and short sea shipping) in 1998.

Several obstacles or bottlenecks are of a regulatory nature and will have to be dealt with by the public authorities (the European Community in particular) in order to increase the benefits from multi-modal transport. For example the diversity of modal-based administrative procedures, the single market that is not yet completed in certain areas (e.g. competition rules), or missing infrastructure links.

The most common form of combined transport is rail-transport with containers, swap bodies and semi-trailers. During the nineties, the share of rail traffic, sea traffic and inland waterway traffic in multi-modal transport chains increased with 4 % to 245 billion tonnes-km. (European Commission, 2002b).

Other

The relatively stable modal share of and the preference for road can be explained by some important factors:

- The type of the goods transported plays an important role in mode choice. Perishable, high value goods require fast and reliable transportation road transport is often the fastest and most reliable form of transport available, providing much flexibility with pickup and delivery points. *Agriculture products* and *manufactured goods* belong to the most important goods transported throughout Europe. Their shares in tonne-kilometres are also rising (see TERM 2003 13a Freight transport demand, sub-indicator on types of goods transport). As such goods are often perishable and have high values, it can partly explain the strong position and increasing share of road transport.
- Modern trade requires 'just-in-time' delivery of goods. Transport speed and flexibility are therefore of great importance. Despite congestion, road transport is often faster and more flexible than rail or water transport. Besides, due to spatial planning and infrastructure development, many destinations can only be reached by road.
- The road sector is liberalised to a great extent, while the inland waterway has just been opened up (1 January 2000) and the rail sector is just starting to open up.
- The average tonne of goods carried by road travels about 110 km (European Commission, 2001f), a distance over which rail or inland waterways are less efficient because road transport is needed to and from the points of loading. Moreover, in using multi-modal transport for such short distances valuable time will be lost due to lack of standardisation of loading units and close and fast connections between inland waterways and rail. For short sea shipping the average tonne of goods is carried over 1430 km (European Commission, 2001f). Here, time is less an issue. The low price of shipping is probably of overriding importance (see TERM 2002 20 EU Transport prices).

The lack of recent data for short-sea shipping and oil pipelines on country level hinders an assessment considering the modal shares of all modes. Especially in the case of peripheral States e.g. Greece, Portugal and Finland, where the share of short-sea shipping was even above 70 % in 1996, the exclusion of short-sea shipping and oil pipelines drastically alters the assessment. For illustration, the shares of modes including short sea shipping and oil pipelines for 1996 are shown in Table 1. As can be seen from this table, oil pipeline transport is of major importance in Norway and Austria (both about 22 %).

In the United States, the shares of the modes are totally different from Europe (see Figure 3). Road transport only contributes for 38 % to road, rail and inland shipping. Rail transport contributes for 49 % and inland shipping for 13 % to rail, road and inland waterway transport. In the EU, these numbers were 79, 14 and 7 % for road, rail and inland shipping respectively in 1999.





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Data

Table 1:Shares of modes in freight transport by country in 1996 including short sea
shipping and oil pipelines

Unit:	%	of	tonne-km

	Road	Rail	Inland shipping	Oil pipelines	Short sea shipping
Belgium	36 %	6 %	5 %	1 %	51 %
Denmark	45 %	7 %	_	2 %	45 %
Germany	50 %	16 %	13 %	3 %	18 %
Greece	17 %	2 %	_	_	81 %
Spain	43 %	7 %	_	3 %	47 %
France	50 %	17 %	2 %	6 %	26 %
Ireland	33 %	7 %	-	_	61 %
Italy	43 %	11 %	-	3 %	42 %
Luxembourg	84 %	8 %	9 %	_	_
Netherlands	30 %	7 %	17 %	3 %	43 %
Austria	44 %	29 %	6 %	21 %	-
Portugal	23 %	11 %	-	-	66 %
Finland	18 %	2 %	-	-	79 %
Sweden	46 %	9 %	-	_	45 %
United Kingdom	37 %	8 %	-	3 %	52 %
Iceland	#N/A	#N/A	#N/A	#N/A	#N/A
Norway	26 %	6 %	-	22 %	46 %
EU-15	41 %	11 %	4 %	3 %	41 %
Source: Eurosta	t, 2003				

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Table 2:Shares of modes in freight transport by country in 2000 excluding short
sea shipping and oil pipelines

Unit: % of tonne-km

	Road	Rail	Inland shipping
Belgium	68 %	17 %	15 %
Denmark	92 %	8 %	-
Germany	66 %	18 %	16 %
Greece	98 %	2 %	-
Spain	92 %	8 %	-
France	76 %	21 %	4 %
Ireland	96 %	4 %	-
Italy	89 %	11 %	-
Luxembourg	88 %	8 %	4 %
The Netherlands	60 %	4 %	36 %
Austria	58 %	37 %	5 %

Portugal	89 %	11 %	-
Finland	73 %	27 %	-
Sweden	61 %	39 %	-
United Kingdom	92 %	8 %	-
Iceland	100 %	0 %	-
Norway	88 %	12 %	-
EU-15	77 %	15 %	8 %

Source: Eurostat, 2003

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Meta data

Technical information

1. Data source: Freight transport demand: Eurostat Structural indicator data (Eurostat, 2003):

http://europa.eu.int/comm/eurostat/Public/datashop/printproduct/EN?catalogue=Eurostat&product=1-structur-EN&mode=download#Emploi)

2. Description of data: Data contains the number of tonne-km by road, rail, inland waterways, short sea shipping and oil pipelines. Tonne-km: unit of measure of goods transport which represents the transport of one tonne by road over one kilometre (the distance to be taken into consideration is the distance actually run).

GDP: Gross Domestic Product in constant 1995 prices (milliard Euro). File: TERM 2003 00 EU+AC – Basedata.xls

Original measure units: Tonne-km

- 3. Geographical coverage: EU-15 (Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom) and Iceland and Norway (EEA member).
- 4. Temporal coverage: Tonne-km: 1991-2000
- 5. Methodology and frequency of data collection: Tonne-km: annually collected by a Common Questionnaire developed jointly by Eurostat, UNECE and ECMT
- 6. Methodology of data manipulation, including making 'early estimates':

The demand for EU-15 oil pipeline transport in 2000 is estimated, based on growth numbers from the DG TREN Pocketbook. Data for short sea shipping in the EU-15 is based upon DG TREN estimates from the DG TREN Pocketbook. (European Commission, 2002b)

Quality information

- 7. Strength and weakness (at data level): Danish statistics on oil pipeline transport seem not trustworthy: oil pipeline transport accounts for 27 % of total goods transport in 1999, which seems too high. Previous publications of Danish transport statistics show a 2 times lower transport demand for oil pipelines.
- 8. Reliability, accuracy, robustness, uncertainty (at data level): Data is reliable
- 9. Overall scoring (give 1 to 3 points: 1=no major problems, 3=major reservations): 2 (data for short sea shipping is lacking)

Relevancy: 2 (Vehicle-km provides a better unit of measurement, since it is more directly linked to environmental impact of transport movements)

Accuracy: 2 (Tonne-km figures are estimated rather than measured, but are rather consistent between sources)

Comparability over time: 1

Comparability over space: 1

Further work required

Further work is needed to develop reliable and comparable statistics on vehicle-km used for freight transport, since such data is closer connected to the environmental consequences of transport and might reveal evolution of load factors.

More recent data is needed on short-sea shipping.

Better data on intermodal services would provide a clearer picture of trends in this sub-sector of transport, which would facilitate research and policy in this field.