

Unitisation of freight transport in Europe, 2005

Highlights

Data presented in this publication concern intermodal and unitised transport in Europe, performed by rail, road, sea and inland waterways (IWW).

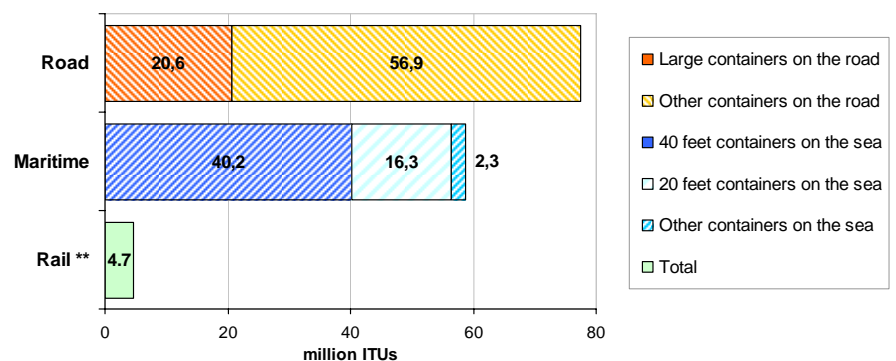
Intermodal transport is defined as the movement of goods (in one and the same loading unit or vehicle) by successive modes of transport without a handling of the goods themselves when changing modes, while unitised transport (i.e. cargo in containers or other mobile units) includes movement using only one mode.

The main results for the year 2005 are summarised in this first part of this publication whereas more detail is given in the following sections:

- The major part of unitised transport in the EU is performed on roads
- Containerised road transport performance in the EU remains stable
- The Netherlands leads in the share of containerisation on road transport
- Germany's rail and road transport performances of unitised cargo are more than double that of any other Member State
- The rail share in unitisation is high on the North-South axis
- Containers and swap bodies are by far the most important rail loading units
- In several Member States, over 50% of the container traffic is accounted for by maritime transport.

Goods traffic by intermodal transport units

Figure 1: Intermodal Transport Units (ITUs) forwarded at EU-27 level*, by mode of transport, 2005



* EU-27 countries except: BG, DK, IE, FR, HU, MT, NL, RO, UK for rail and road transport. Maritime transport is overestimated.

** DE, EL: 2004 data

Note: for inland waterways data not available

Road, with 77.5 million ITUs carried in 2005, is the most important transport mode in unitised transport in Europe. Another large share of traffic is taken by maritime transport with 58.8 million ITUs while rail is considerably less with 4.7 million ITUs (Figure 1). Hence, for each ITU carried by rail there are approximately 12 ITUs carried by sea and 16 ITUs by road.

Statistics in focus

TRANSPORT

20/2008

Author

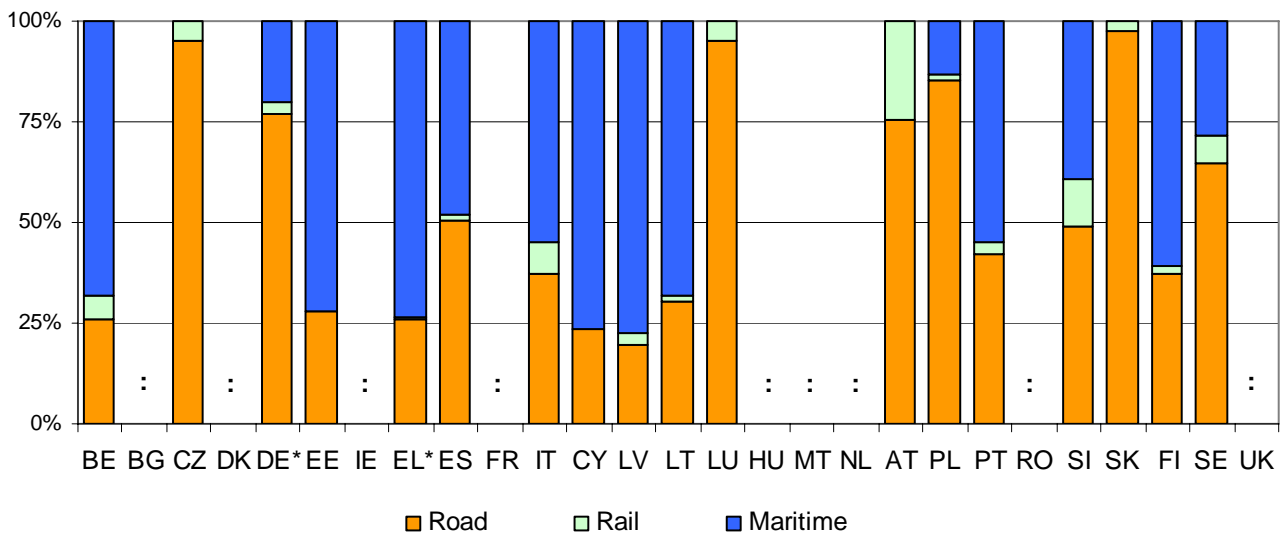
Simo PASI

Contents

Highlights	1
Goods traffic by intermodal transport units.....	1
Share of unitisation in rail and road transport	3
Transport performance by type of transport.....	5
Traffic flows in the main German ports	5



Figure 2: ITUs carried in EU-27: distribution by country and by mode of transport, 2005



* 2004 for data on Rail transport

As shown in Figure 2, the situation at national level in 2005 is quite heterogeneous, often influenced by geographical factors such as a gateway to the sea. Among the EU Member States having maritime coastlines, few record a road share in unitised transport larger than half. This is the case for Germany (2004 data), Spain, Poland and Sweden.

Relevance of rail transport is marginal; it accounted for 25% in Austria and exceeded 10% in Slovenia.

With regards to the absolute values (see Table 1), Germany leads in all three modes of transport observed. It is particularly true in road transport, where the number of ITUs carried, 45 million, exceeded the volumes registered in the United Kingdom, Spain, the Netherlands, Italy and France combined. Of influence is an extraordinary high level of *other containers* carried, including swap bodies in the German road freight survey.

In rail transport, only Germany and Italy were over the threshold of one million ITUs forwarded, registering 1.77 million and 1.03 million ITUs respectively.

Maritime transport was more balanced between Member States, six of them showing figures ranging between 6.9 and 12 million ITUs in 2005.

Considering the three transport modes together, it appears that Germany carried almost 60 million ITUs, i.e. approximately one ITU in three in the EU is either loaded or unloaded in this country. Germany is followed by Spain, the Netherlands and the United Kingdom, accounting for about 20 million ITUs. However, the figures of the latter two countries are underestimated due to lack of data for containerised transport by rail.

Table 1: ITUs carried: distribution by country and by mode of transport, 2005

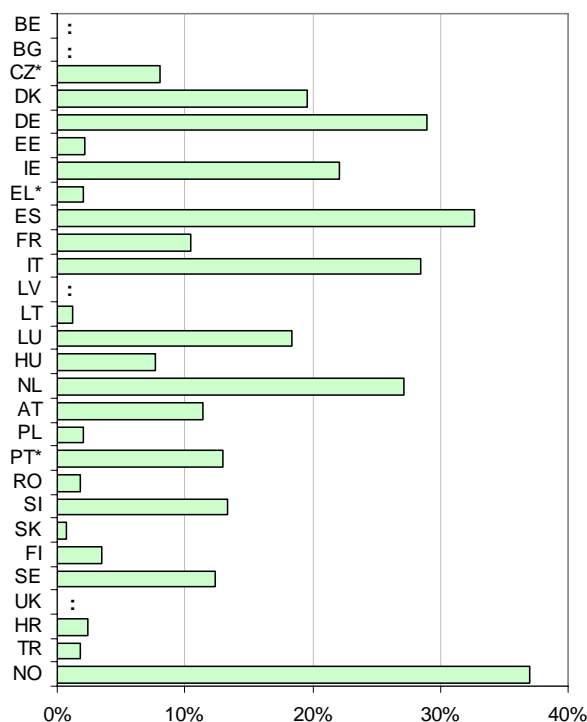
	Road - Large containers	Road - Other containers	Rail *	Maritime
BE	2 002 000	631 000	610 982	6 901 982
BG	:	:	:	108 776
CZ	667 000	2 297 000	156 163	-
DK	:	:	78 048	603 440
DE	7 709 000	38 162 000	1 768 494	11 995 989
EE	39 000	34 000	186	189 648
IE	:	:	7 574	992 329
EL	250 000	380 000	6 872	1 766 688
ES	4 010 000	6 802 000	334 958	10 227 862
FR	1 919 000	2 265 000	:	3 750 798
IT	2 483 000	2 294 000	1 025 279	7 023 007
CY	57 000	44 000	-	325 114
LV	8 000	31 000	6 411	154 965
LT	36 000	59 000	4 412	214 321
LU	:	75 000	4 037	-
HU	:	:	93 527	-
MT	:	:	-	86 183
NL	4 487 000	5 426 000	:	9 343 144
AT	:	863 451	281 544	-
PL	502 000	2 675 000	60 413	492 208
PT	408 000	312 000	48 340	936 214
RO	:	:	64 376	867 036
SI	98 000	163 000	62 025	210 343
SK	231 000	846 000	24 413	-
FI	522 000	273 000	40 882	1 300 633
SE	1 637 000	933 000	271 913	1 116 401
UK	5 673 000	5 669 000	:	7 695 642
HR	:	:	:	93 504
TR	:	:	:	:
NO	:	:	:	517 138

*DE, EL: 2004 data

AT, road: including large containers

Share of unitisation in rail and road transport

Figure 3: Share of unitisation in rail transport, as a percentage of the total number of tkm performed in rail goods transport, 2005



* 2004 data

In order to evaluate the importance of unitised transport in total goods transport it is useful to have a look at their shares in the total tkm performed in 2005. Figure 3 shows these shares for rail goods transport.

Norway is first among European countries with 37% whereas Spain is first in the EU with a share of 33%, closely followed by Germany, Italy and the Netherlands with shares between 27% and 29%. This group of countries seems to feature a developed level of containerisation on North-South axis, starting in Scandinavia and ending in Spain and Italy. For many other countries, often located at the EU's outer borders, this share is below 3%.

In absolute terms, highest performances in unitised traffic expressed in tkm are registered in Germany (25.8 billion tkm), Italy (9.4), France (8.7), Spain (3.8), Sweden and Austria (3.7), accounting together for over 80% of the EU's performance.

Considering distribution by type of loading unit, containers and swap bodies are dominant. Seven EU Member States and Norway performed in 2005 more than one billion tkm by means of these carrying units.

For the remaining tkm performed, the forwarding of accompanied road vehicles is fairly common in Hungary and Austria while the rail transport of semi-trailers (unaccompanied) is significant in Germany (2.3 billion tkm), France (1.9) and Sweden (1.1); for the latter two countries also in relative terms.

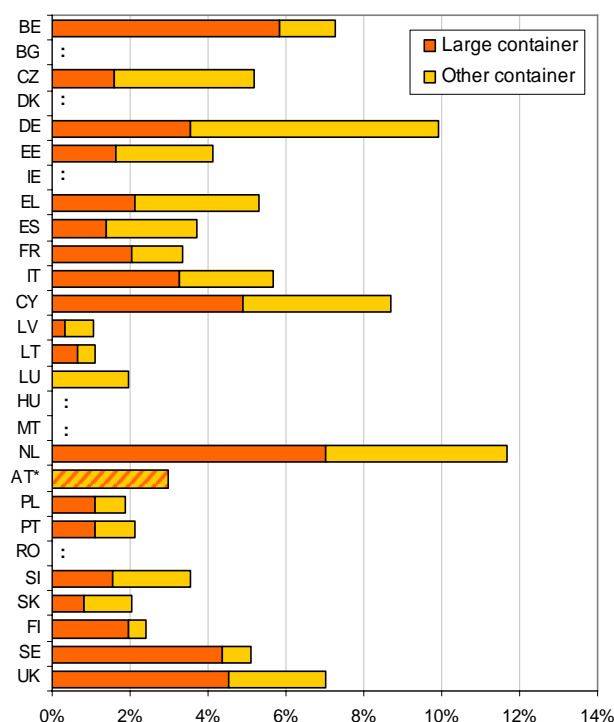
Despite its low volume in absolute terms, these loading units accounted for about 40% in Denmark. A similar share was registered in Finland when combining the transport performance of road vehicles (accompanied) and semi-trailers (unaccompanied).

Exact definitions used for loading units are described in the Methodological Notes section on page 7.

Table 2: Rail performance, by type of intermodal loading unit, in million tkm, 2005

	Containers and swap bodies	Road vehicles (accomp.)	Semi-trailers (unaccomp.)	Total
BE	:	:	:	2 556
BG	:	:	:	:
CZ	1	0	0	1
DK	387	0	263	650
DE	23 348	60	2 372	25 780
EE	224	0	0	224
IE	67	0	0	67
EL	:	:	:	:
ES	3 806	0	0	3 806
FR	6 776	62	1 887	8 725
IT	:	:	:	9 357
CY	-	-	-	-
LV	0	0	0	0
LT	143	2	:	145
LU	72	0	0	72
HU	701	653	22	1 376
MT	-	-	-	-
NL	:	:	:	1 452
AT	2 167	1416	135	3 718
PL	1 005	4	0	1 009
PT	0	0	0	0
RO	646	31	13	690
SI	431	54	0	485
SK	152	:	:	152
FI	335	120	180	635
SE	2 680	0	1068	3 748
UK	:	:	:	:
HR	68	5	0	73
TR	161	0	0	161
NO	1 164	335	874	2 373

Figure 4: Share of containerisation in road transport, as a percentage of the total number of tkm performed in road freight transport, 2005



* No details available for large and other containers

The same indicator outlined in Figure 3 for rail transport is presented in Figure 4 for road transport. For this mode there is not a single country whose freight hauliers reported a containerisation share of over 20%. Twelve percent of all tkm performed by Dutch lorries were by container; this share is 10% in Germany.

Among the other EU Member States, seven registered shares between 5% and 10% while twelve displayed a share under 5%.

Information in Table 3 shows road freight transport of containers performed by hauliers registered in the respective Member States in the years 2004 and 2005, with a distribution by type of container.

First two EU countries in terms of absolute increases between the two years are Germany (+3 billion tkm), and Italy (+0.8). In relative terms, however, the highest increases were reported by Estonia, Cyprus and Latvia. Yet, these evolutions should be considered with care due to the low absolute number of tkm performed.

In eleven Member States, the tkm performance of freight in containers in 2005 stood under the level of a year earlier. The most important absolute decreases were registered in the Czech Republic, Spain, France and Greece. In relative terms the Czech Republic and Lithuania showed the most important reductions.

Restricting the scope to EU countries performing over one billion tkm of containerised freight transport in

2005, it appears that countries that had extra-EU borders prior to the 2004 EU enlargement registered considerable growth rates between 2004 and 2005, especially Germany (+11%), Poland (+10%) and Italy (+9%).

Countries not having this geographic feature recorded a decrease in container freight transport. This evolution ranged from -33% in Greece to -2% in UK, including France (-8%), Belgium (-7%), Spain (-7%) and Sweden (-4%). The two exceptions to this 'rule' were the Czech Republic (decrease instead of growth) and the Netherlands (increase instead of decrease).

When considering the distribution by type of container, the situation in the EU is generally balanced with a slight dominance of large freight containers (54%). There are some exceptions among the individual Member States: the most relevant being Germany and Spain with over 60% of containerised tkm performed in 'Other freight containers', as opposed to Belgian hauliers where the share of large containers amounted to 80%.

Looking at the relative growth in the individual container categories between 2004 and 2005 (and continuing to restrict the view to those countries that performed over one billion tkm), increases exceeding 5% for large containers were reported for Spanish, Dutch and German hauliers while -5% was registered for Belgian and French hauliers. For 'other containers', highest growths can be seen for Czech and German hauliers whereas decreases were reported by road freight forwarders of Spain, France, Italy and the United Kingdom.

Table 3: Road transport performance, by type of container, in million tkm, 2004-2005

	2004			2005		
	Large freight containers	Other freight containers	Total containers	Large freight containers	Other freight containers	Total containers
BE	2 967	806	3 773	2 823	702	3 525
BG	:	:	:	:	:	:
CZ	5 892	583	6 475	694	1 566	2 260
DK	:	:	:	:	:	:
DE	10 224	16 666	26 890	10 735	19 154	29 889
EE	70	24	94	98	148	246
IE	:	:	:	:	:	:
EL	922	933	1 855	496	750	1 246
ES	2 834	6 486	9 320	3 263	5 391	8 654
FR	4 355	3 108	7 463	4 157	2 687	6 844
IT	4 577	4 578	9 155	5 752	4 215	9 967
CY	33	51	84	68	53	121
LV	29	41	70	29	61	90
LT	115	173	288	106	68	174
LU	:	157	157	:	174	174
HU	:	:	:	:	:	:
MT	:	:	:	:	:	:
NL	5 376	3 998	9 374	5 917	3 916	9 833
AT	:	:	747	:	:	836
PL	1 249	658	1 907	1 214	890	2 104
PT	492	517	1 009	473	426	899
RO	:	:	:	:	:	:
SI	215	111	326	172	218	390
SK	326	266	592	186	277	463
FI	629	169	798	618	155	773
SE	1 521	322	1 843	1 506	264	1 770
UK	7 201	4 881	12 082	7 624	4 208	11 832

Transport performance by type of transport

Table 4: Transport performance of unitised cargo expressed in million tkm, rail (total, national, international and transit) and road (total), 2005

	Rail				Road
	National	International	Transit	Total	Total
BE	950	1 605	1	2 556	3 525
BG	:	:	:	:	:
CZ	0	0	0	1	2 260
DK	358	153	139	650	0
DE	8 905	12 351	4 524	25 780	29 889
EE	0	6	218	224	246
IE	67	0	0	67	:
EL	:	:	:	:	1 246
ES	3 254	552	0	3 806	8 654
FR	3 332	2 684	2 709	8 725	6 844
IT	6 536	2 821	:	9 357	9 967
CY	-	-	-	-	121
LV	0	0	0	0	90
LT	0	93	51	145	174
LU	2	5	66	72	174
HU	11	1 021	343	1 376	:
MT	-	-	-	-	:
NL	768	684	:	1 452	9 833
AT	778	2 079	860	3 718	836
PL	382	409	218	1 009	2 104
PT	0	0	0	0	899
RO	75	387	228	690	:
SI	40	333	113	485	390
SK	9	79	64	152	463
FI	513	59	63	635	773
SE	3 154	471	123	3 748	1 770
UK	:	:	:	:	11 832
HR	3	40	30	73	:
TR	41	120	0	161	:
NO	2 143	230	0	2 373	:

Table 4 shows a country comparison of total unitised transport performances between rail and road in 2005, with rail transport further broken down by type of transport (national, international and transit).

In 2005 in all but five countries, Austria, Sweden, France, Slovenia and Denmark, road freight performance expressed in tkm exceeded that of rail.

Among countries with a total transport performance of at least one billion tkm, the ratio road/rail was particularly unbalanced for the Netherlands where road outnumbered rail by a factor of 7.

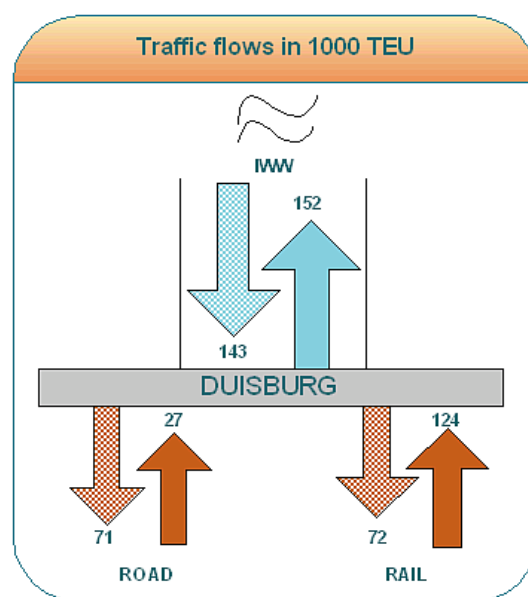
Looking at the performances by type of rail transport, it appears that Hungary, Belgium, Austria and Germany, forward ITUs mostly in international transport while national transport is predominant in Spain, Sweden and Italy. In the Netherlands, France and Poland the situation is almost balanced.

Traffic flows in the main German ports

As mentioned earlier, Germany ranks first in Europe in terms of ITUs carried by rail, road and sea. This section is specific to Germany and focuses on three German ports: Duisburg on the Rhine as the largest inland port in the world and the two largest container ports in Germany, Hamburg (linked to the North Sea through the Elbe estuary) and Bremen/Bremerhaven (two ports on the North Sea coast belonging to one statistical entity). The inland port of Duisburg interlinks the rail, road and inland waterway transport modes while Hamburg and Bremen/Bremerhaven add the maritime transport mode.

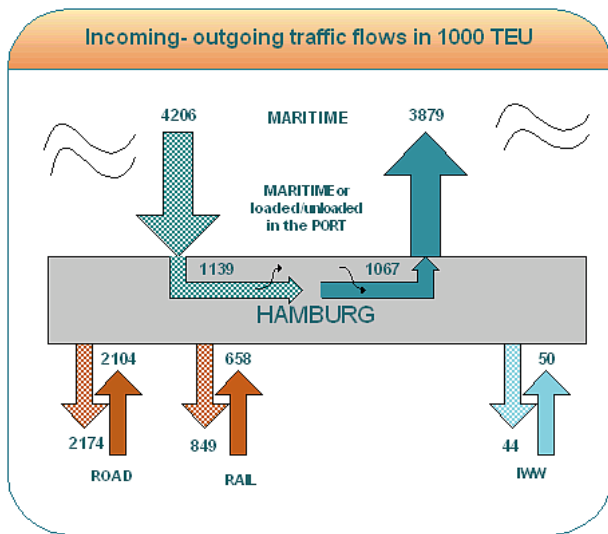
Looking at the Duisburg traffic flows, arrivals and dispatches measured in TEUs are nearly balanced for inland waterways, i.e. transport over the Rhine (see Figure 5). For outgoing transport (leaving the port of Duisburg) road and rail are balanced, whereas for the incoming transport, the rail flow is almost five times as high as the road flow.

Figure 5: Duisburg port traffic flows in 1000 TEU, 2005



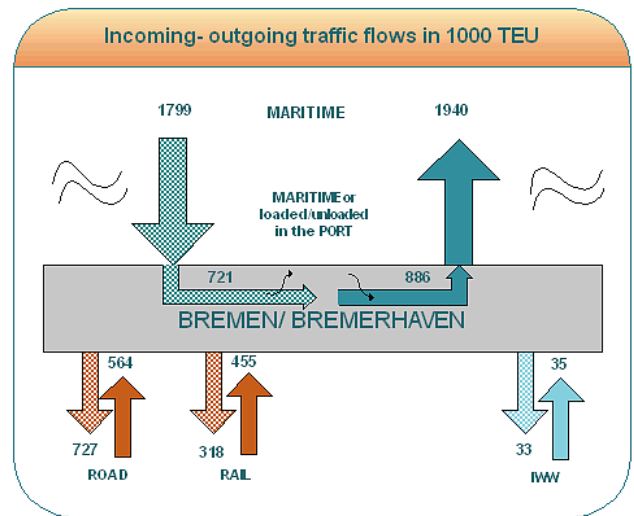
Source: DESTATIS

Figure 6: Hamburg traffic flows in 1000 TEU, 2005



Source: DESTATIS

Figure 7: Bremen/Bremerhaven ports traffic flows in 1000 TEU, 2005



Source: DESTATIS

According to data for the number of intermodal transport units (measured in TEU) handled in 2005 Hamburg and Bremen/Bremerhaven ranked second and fourth place respectively among EU ports, Rotterdam (NL) and Antwerp (BE) being in first and third position respectively.

Analysing data from a DESTATIS (the Federal Statistical Office of Germany) report, one can not only extract the total number of ITUs handled but also the distribution amongst modes of transport for both incoming and outgoing flows. This level of detail allows the evaluation of the relative importance of each mode of transport in the transport chains, including the maritime leg.

In Hamburg, maritime arrivals and departures slightly differ. TEUs' arrivals sum up to 4.2 million whereas about 3.9 million TEUs are dispatched. This gap is mainly concentrated further upstream in the divergence of incoming and outgoing rail traffic.

The distribution of traffic by mode (expressed as shares) is very similar between incoming (units arriving by sea transport and continuing to other ports or to the hinterland by sea, road, rail or inland waterways) and outgoing (where the units arrive to port by sea, rail, road and inland waterway modes and continue by sea) cargo flows.

For example, as a second leg in the incoming transport chain, road took a share of close to 50% (2 174 000 TEU's out of a total of 4 206 000 TEU's). One quarter is either unloaded in the port or embarked again as sea cargo, about one fifth continues by rail and the remaining 1% by inland waterways, starting that leg on the river Elbe.

In absolute terms, the port of Bremen/Bremerhaven only handles half the volume of that of Hamburg.

A first difference to be noticed is the excess registered in the maritime outgoing flow.

On average, for every 100 TEUs arriving at the port by sea, 40 are resent via sea or unloaded in the port, another 40 TEUs are further forwarded by road vehicles, 18 by rail and 2 by IWW (over the Weser river).

For the opposite (outgoing) transport flow, maritime transport is the most common incoming mode for Bremen/Bremerhaven; hence those ITUs are redirected using the same transport mode. For 100 TEUs leaving by sea, around 45 TEUs did also arrive in the port by sea ('in transit') or were loaded in the port. As regards the origin of the remaining 55 ITUs for a successive loading as sea cargo, 30 of them arrived in Bremen/Bremerhaven by road, 23 by rail and 2 by IWW.

It should be noted that maritime transport includes short sea (Europe; Baltic Sea and Mediterranean) and deep sea shipping.

In Hamburg, short sea shipping represented around 35% of the incoming and outgoing flows. A similar share was registered in Bremen/Bremerhaven for the outgoing flow whereas it reached almost 50% for the incoming containerised cargo.

➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Data availability

The figures presented in this publication have been extracted from Eurostat's reference transport database (NewCronos). They include the transport statistics of the Member States collected according to the following legislation:

- Rail - Regulation n° 91/2003.
- Road – Regulation n° 1172/98
- Maritime – Directive n° 95/64/CE

Figures 5, 6 and 7 have been taken from the report "Kombinierter Verkehr – 2005", published by DESTATIS, the Federal Statistical Office of Germany.

Country	Characteristics of data availability
CY, MT	No railways transport
CZ, LU, HU, AT, SK	No maritime transport
BG, FR, NL, UK	No data available on ITUs carried by rail
BG, DK, IE, HU, MT, RO	No data available on ITUs carried by road
AT	Revised data (figures in bold) for road in ITU and tkm and also rail in ITU provided by Austrian NSI

Methodology

Total ITU rail transport is estimated by taking the sum of national and international outgoing transport (see below), as to avoid double counting.

Estimated number of ITUs carried by mode:

- Rail: loaded containers, swap bodies, semi-trailers and road vehicles,
- Road: "basic transport operations" (BTO) using large freight containers and other freight containers
- Maritime transport: loaded and unloaded units measured in TEU

BTO is used as an approximative indicator of moving intermodal transport units: one ITU is moved in one basic transport operation on road.

As to type of cargo DE, IT, LT, LV, AT, PT, SK, RO and UK follow Eurostat methodological manual, recording swap bodies as "other containers" while DK, ES, CY, PL and FI follow UNECE recommendation 21/1994. In the latter countries only transport units below 20 feet are recorded as "other containers" – swap bodies belong to "large freight containers".

Definitions

Unitised and containerised transport

Unitised transport is the carriage of cargo in transport units such as containers or mobile (Ro-Ro) units. Containerised transport is more restricted, covering the carriage of cargo in ISO containers, swap bodies or other containers.

Intermodal transport unit (ITU)

Container, swap body or semi-trailer/goods road motor vehicle suitable for intermodal transport.

Container

Special box to carry freight, strengthened and stackable and allowing horizontal or vertical transfers.

Swap body

Carrying unit 2½ metres wide, strong enough for repeated use, but not enough to be top-lifted or stackable more than two deep when loaded, and designed for intermodal transport by road or rail of which at least one leg is by road or rail.

Sizes of containers

The main sizes of containers are:

- a) 20 Foot ISO container (length of 20 feet and width of 8 feet);
- b) 40 Foot ISO container (length of 40 feet and width of 8 feet);
- c) Super high cube container (oversize container); and
- d) Air container

Containers classified under a) to c) are referred to as large containers

TEU (Twenty-foot Equivalent Unit)

Standard unit for counting containers of various capacities and for describing the capacities of container ships or terminals. One 20 Foot ISO equals 1 TEU.

Semi-trailer

Goods road vehicle with no front axle designed in such way that part of the vehicle and a substantial part of its loaded weight rests on the road tractor.

Goods road vehicle

Road vehicle designed, exclusively or primarily, to carry goods.

National transport

Transport between two places (a place of loading and a place of unloading) located in the same country.

International railway transport

Transport between two places (a place of loading and a place of unloading) in two different countries.

International goods transport by rail - loaded (outgoing)

Goods carried by rail between a place of loading located in the reporting country and a place of unloading in another country.

International goods transport by rail - unloaded (incoming)

Goods carried by rail between a place of loading located in a foreign country and a place of unloading in the reporting country.

Transit

Transport through a country between two places (a place of loading and a place of unloading) outside that country.

Tonne-kilometre - tkm

Unit of measure of goods transport which represents the transport of one tonne of goods over a distance of one kilometre.

BTO - basic transport operation

The transport of one type of goods between its place of loading and its place of unloading.

Symbols:




- : not available
- not applicable
- 0 actual zero or very negligible transport

This publication was produced with the assistance of Sandrine Cipponeri, Jelle Bosch and Marco Alciator.

Further information:

Data: [EUROSTAT Website/Home page/Transport/Data](#)

Transport

-  [Railway transport](#)
-  [Road transport](#)
-  [Maritime transport](#)

Journalists can contact the media support service:

Bech Building Office A4/125
L - 2920 Luxembourg

Tel. (352) 4301 33408
Fax (352) 4301 35349

E-mail: eurostat-mediasupport@ec.europa.eu

European Statistical Data Support:

Eurostat set up with the members of the 'European statistical system' a network of support centres, which will exist in nearly all Member States as well as in some EFTA countries.

Their mission is to provide help and guidance to Internet users of European statistical data.

Contact details for this support network can be found on our Internet site: <http://ec.europa.eu/eurostat/>

A list of worldwide sales outlets is available at the:

Office for Official Publications of the European Communities.

2, rue Mercier
L - 2985 Luxembourg

URL: <http://publications.europa.eu>
E-mail: info@publications.europa.eu
