" In 2020, road freight transport accounted for 77.4 % of the total inland freight transport, followed by rail and inland waterways transport (16.8 % and 5.8 % respectively). "

" In 2020, Lithuania had the highest share of rail freight transport in total inland freight transport, with 64.7 %. "

" In 2020, the Netherlands had the highest share of inland waterways freight transport in total inland freight transport, with 41.6 %. "

" In 2020, road is the leading mode of freight transport at intra-EU level (54.7 %) followed by maritime transport (29.0 %) and rail transport (11.9 %). "

This article mainly analyses the relative importance of the different inland transport modes (road, rail, inland waterways) in freight transport in the European Union (EU). It explains the principles of the modal split between the different transport modes. It also describes the adjustments applied to road freight data in order to compare the share of each of these three modes in the transport performance on each country’s territory. In addition, this article presents results regarding the modal split at EU level for five transport modes (including maritime and air transport, in addition to road, rail and inland waterways) and explains the calculation principles for air and maritime transport performance.

**Modal split in the EU**

**Road transport continues to carry three quarters of freight in the EU**

Road transport continues to have the largest share of EU freight transport performance among the three inland transport modes. Figure 1 shows that in 2020 road transport accounted for more than three-quarters (77.4 %) of the total inland freight transport (based on tonne-kilometres performed). This share increased by 1.1 percentage points (pp) compared to the previous year. The lowest share in the last decade was observed in 2012, with 73.5 %. Since then the share of road has constantly increased. Compared to 2012, the share of road increased by 3.9 pp in 2020.
The share of rail in the inland transport performance reached a low point in 2020 (16.8 %) after a drop of 0.9 pp compared to 2019. Over the period 2010-2020, the share of rail reached 19.2 % in 2011 after an increase by 1.2 pp compared to 2010. It remained stable in 2012 (19.1 %). In 2013, a drop by 0.4 pp was observed compared to the previous year. Between 2013 and 2016, the share of rail remained relatively stable (between 18.7 % and 18.8 %). In 2017, it decreased by 0.7 pp but rebounded by 0.5 pp in 2018. In 2019, rail transport accounted for 17.7 % of the EU total, decreasing by 0.9 pp compared to the previous year.

The share of inland waterways in inland freight transport performance slightly decreased in 2020 (5.8 %) compared to 2019 (-0.2 pp), reaching the same low point as observed in 2018. This low point was reached in 2018 after a constant fall since 2014. In 2010, 2012 and 2013, a peak was reached at 7.4 %.

Noticeable changes in the modal split of Estonia, Latvia and Slovakia from 2010 to 2020

Even though the modal split between the different modes of transport does not tend to change radically from year to year at EU level, changes are sometimes more noticeable at country level. As it can be seen in Figure 2, the modal split at country level varies considerably. In particular, the modal split obviously depends on the availability of a given mode. In particular, Cyprus and Malta do not have either railways or navigable inland waterways; thus, for these two Member States the share of road freight transport is 100 % by default. Moreover, only 17 of the Member States report freight data on inland waterways.
The importance of rail transport in the Baltic Member States is evident. For several years, the share of rail in the total transport performance was in the range 70% - 85% in the three Baltic countries. However, the share of rail in Estonia has constantly fallen between 2010 and 2016, when it dropped below 50%. Compared to 2010, there was a 36.8 pp decrease in 2020 for Estonia (see Figure 3). Compared to 2019, there was a decrease of 3.4 pp.

From 2010 to 2020, the decreases in the share of rail transport were noticeable also in Latvia (-25.6 pp), Slovakia (-10.0 pp), Lithuania (-8.1 pp), Czechia (-7.3 pp), Poland (-6.9 pp) and Sweden (-5.9 pp). When comparing to 2019, Latvia recorded the highest fall in 2020 (-17.1 pp). In contrast, there was an increase only for nine EU Member States over the period 2010-2020; the highest growth being observed for Bulgaria (+3.7 pp), followed by Italy and Slovenia (both +2.7 pp). Between 2019 and 2020, there was an increase in the share of rail transport only for six EU Member States; the highest being recorded by Hungary (+2.8 pp).
Figure 3: Share of rail in total inland freight transport, 2010, 2019 and 2020 (% based on tonne-kilometres)

Source: Eurostat, (tran_hv_frmod)

Figure 4 shows that the share of inland waterways freight transport is very significant in the Netherlands (41.6 % in 2020), but is still below the share of road (52.2 % in 2020). The comparatively high shares of inland waterways freight transport in Bulgaria (28.7 % in 2020) and Romania (28.6 % in 2020) are partly explained by the extensive traffic on the Danube and partly by the ‘territorialisation’ of the road freight transport (more information on this adjustment is given in the Data sources section below).

Bulgaria registered a decrease of the share of inland waterways freight transport in 2020 compared to the previous year (-3 pp). When comparing to 2010, the share of inland waterways freight transport dropped for Romania (-5.2 pp), Bulgaria (-4.9 pp), Luxembourg (-4.7 pp) and the Netherlands (-4.2 pp).
Between 2010 and 2020, the share of road in total inland transport performance dropped only in five EU Member States; the largest fall being recorded in Portugal (-3.3 pp), followed by Italy and Slovenia (both -2.7 pp). For Slovenia, the fall in the share of road in the modal split was mainly caused by a substantial increase in the tonne-kilometres performed by rail (+38.2 %) over the period 2010-2020 (see Table 1).
When looking at the two most recent reference years, Hungary showed the strongest decrease in the share of road with -2.6 pp from 2019 to 2020, followed by Croatia (-1.8 pp). Only four other EU Member States and Norway registered a fall in the same period (less than 1.5 pp). For Hungary, the fall in the share of road in the modal split was mainly caused by a significant increase in the tonne-kilometres performed by rail (+9.1 %), combined with a drop in the tonne-kilometres performed by road (5.3 %) (Table 1). In contrast, the share of road increased the most in Latvia (+17.1 pp), followed by Bulgaria (+3.5 pp), Czechia and Estonia (both +3.4 pp). For Latvia, the fall in the share of road in the modal split was mainly caused by a substantial decrease in the tonne-kilometres performed by rail (-46.9 %) in 2020 compared to the previous year (Table 1).

It should be kept in mind that the share of each mode of transport is calculated dividing the tonne-kilometres performed by each mode by the tonne-kilometers performed by all inland modes. This means that an increasing share of one mode may be a result of noticeable drops in other modes. Thus to clearly evaluate modal split, the change in the tonne-kilometres data used for calculating the modal split are also presented in this article (Table 1).

Inland freight transport performance – modal split based on tonne-kilometres

‘Territorialisation’ of road freight transport

The modal split presented in this article is based on the total inland freight transport performance, expressed in tonne-kilometres. Complying with the relevant EU legal acts, data on rail and inland waterways transport are reported according to the ‘territoriality principle’ (transport on the national territory, regardless of the nationality of the haulier). However, road transport data is reported by the countries according to the nationality of the haulier (regardless of where the transport took place). Therefore, road transport has to be adjusted according to the ‘territoriality principle’ and these data in tonne-kilometres are disseminated in table (road_tert_go) in Eurobase. More information on how this is done by Eurostat is available in the Data sources section below and also in the relevant metadata, here.

Inland freight transport performance in the EU increased by 8.0 % in 2020 compared to 2010
Table 1 shows the transport performance data used for the calculation of the modal split (modal shares are shown in Figures 1 to 5). As mentioned above, the data referring to road transport have been adjusted to reflect on which country’s territory the transport took place, regardless of who performed this transport. The tonne-kilometres series used for calculating the modal split showed an increase of 8.0 % in the total inland freight transport performance in the EU between 2010 and 2020.

Table 1: Inland freight transport performance, adjusted for territoriality, 2010, 2019 and 2020 (million tonne-kilometres) Source: Eurostat, (rail_go_total), (iww_go_atygo) and (road_tert_go)

The aggregated EU transport performance figures show that total inland transport performance increased by around 166 billion tonne-kilometres during the period 2010-2020, reaching 2 255 billion tonne-kilometres in 2020. Road transport performance was 12.0 % higher in 2020 than in 2010. In contrast, over the same period the transport performance decreased by -15.2 % for inland waterways and remained relatively stable for rail (+0.9 %).

Looking only at the two most recent reference years at EU level, the total freight transport performance decreased by 2.5 % from 2019 and 2020, with rail, inland waterways and road decreasing by 7.4 %, 5.7 % and 1.1 % respectively.

At country level, the largest decreases in total transport performance of inland modes from 2019 and 2020 were observed in Latvia (-30.7 %), Cyprus (-19.1 %; covers only road transport), Ireland (-16.9 %), Portugal (-15.0 %), Estonia (-12.7 %), Luxembourg (-12.1 %) and Greece (-10.9 %). The fall in total transport performance in Latvia and Estonia was mainly caused by a sharp decrease in rail transport. In Ireland, Portugal and Greece, it was mainly caused by a sharp decrease in road transport (-17.0 %, -16.2 % and -11.6 % respectively). The decrease in road of Ireland is partially influenced by the break in series in 2020.

In contrast, between 2010 and 2020, the tonne-kilometres performed by road increased in 20 Member States.
Increases of more than 10 % were observed in 18 Member States and Norway. Among them, four countries registered increases of more than 50 %: Lithuania (+72.6 %), Latvia (+64.3 %), Czechia (+61.7 %), and Poland (+50.7 %).

Looking specifically at rail freight transport over the two most recent reference years, tonne-kilometres decreased in 20 EU Member States and Switzerland. The highest falls were observed in Latvia (-46.9 %), Estonia (-19.8 %), Spain (-16.7 %), Slovakia (-15.1 %), Luxembourg (-15.0 %) and Slovenia (-10.7 %).

Modal split based on five transport modes: road competes with maritime at intra-EU level

Figure 6 shows the modal split calculated on the basis of transport performance, measured in tonne-kilometres, of five transport modes: road, rail, inland waterways, air and maritime. When adding air and maritime transport to the inland modes, road still keeps its leading position at the intra-EU level, followed by maritime transport. In 2020, road accounted for more than half of all tonne-kilometres performed in the EU (54.7 %). Maritime transport came next, with less than a third of the total transport performance (29.0 %), followed by rail (11.9 %) and inland waterways (4.1 %). In terms of tonne-kilometres performed, air transport plays only a marginal role in intra-EU freight transport, with a share of 0.3 % in 2020.

In 2020 compared to the previous year, the relative shares of maritime, rail and inland waterways transport decreased by 0.7 pp, 0.5 pp and 0.1 pp, respectively, whereas the share of road transport increased by 1.3 pp and the share of air transport remained stable (-0.03 pp). When looking at the period 2010-2020, inland waterways and rail transport decreased by 1.2 pp and 0.9 pp, respectively, while the share of road and maritime transport increased by 1.6 pp and 0.5 pp respectively. The share of air transport remained relatively stable (-0.05 pp).

Figure 7 presents the transport performance in tonne-kilometres for the five transport modes road, rail, inland waterways, maritime and air between 2010 and 2020. The total transport performance by these five modes of transport increased by 8.7 % from 2010 to 2020. Over this period, the highest relative increase was observed for road (+12.0 %), followed by maritime (+10.8 %). In contrast, inland waterways (-15.2 %) showed the highest decrease over this period, followed by air (-5.8 %). Rail transport performance remained relatively stable over the period (+0.9 %).
Figure 7: Freight transport performance, adjusted for territoriality, EU, 2010-2020 billion tonne-kilometres
Source: Eurostat, (rail_go_total), (iww_go_atygo), (road_tert_go) and Eurostat computations for maritime

Source data for tables and graphs
- Freight transport statistics - modal split: tables and figures

Data sources
The sources for the statistics in this article are from Eurostat. Statistical data have been reported to Eurostat by EU Member States in the framework of various EU legal acts. The essential legal acts are the following:

- Road: Regulation (EU) No 70/2012 on statistical returns in respect of the carriage of goods by road (recast);
- Air: Regulation (EC) No 437/2003 on statistical returns in respect of the carriage of passengers, freight and mail by air
- Maritime: Directive 2009/42/EC on statistical returns in respect of carriage of goods and passengers by sea

This article also includes data for inland transport modes from two EFTA countries Norway and Switzerland. Iceland and Liechtenstein (for LI since 2013) both are granted derogations for road freight transport.

According to Regulation (EU) No 70/2012 on statistical returns in respect of the carriage of goods by road, Malta is granted derogation from reporting road freight data to Eurostat. However, since Malta does not have any railway or inland waterways, the share of road in inland freight transport is 100%.

Adjustment of road freight data according to the 'territoriality principle'

Road freight transport, and particularly the part of international (including cross-trade) transport, needed to be 'territorialised' as it is reported by the countries on the basis of the nationality of the haulier, not on the basis of where the transport was carried out. For example, a haulier from the Netherlands might undertake a journey to
The calculated 'territorialised' air transport performance is a concept intended to be used only for countries with more than 150,000 passenger units annually. In order to calculate transport performance in tonne-kilometres for air transport, Eurostat is using a distance matrix that contains great circle distances (minimum distance on a spherical line) between airport pairs. The distance matrix contains as well a so-called 'territorialisation tool' that allows attributing the calculated tonne-kilometres to the countries overflown on the route. The distance for each country is based on its national airspace, which includes territorial waters of 12 nautical miles between airport pairs according to the relevant legal act. The legal act defines categories of airports according to their handling capacities. In order to calculate tonne-kilometres for maritime transport, Eurostat has developed a distance matrix on the basis of the most likely sea routes taken by vessels. Multiplying tonnes transported between a pair of ports by the relevant distance has been taken from the 'Territorial Typologies' tool (which is notably the case for islands such as the Canary Islands, Madeira, Greek Islands, etc.). In such cases, the region of origin/destination has been given the NUTS 3 region code where the main freight ferry terminals are located in order to avoid further underestimation of the data. It is important to bear in mind that the calculation of international territorialised transport is particularly influenced by the availability of data for non-EU countries and their inclusion or not in the calculations (refer to metadata for Eurobase table road_tert, section 15.2). More information on the territorialised road freight tonne-kilometres can be found in the relevant metadata on Eurostat website, here.

### Calculation of tonne-kilometres for air and maritime freight transport

Within the framework of the relevant legal act, Eurostat collects maritime data of goods transported in tonnes between port pairs (port of loading and port of unloading). Nevertheless, these data cover only defined 'main ports', i.e. ports handling more than 1 million tonnes of goods annually. In order to calculate transport performance in tonne-kilometres for maritime transport, Eurostat has developed a distance matrix on the basis of the most likely sea routes taken by vessels. Multiplying tonnes transported between a pair of ports by the relevant distance has allowed the calculation of the maritime transport tonne-kilometres at EU level. In order to exclude double counting of the same goods being reported as inwards transport by one port and as outwards transport by another port within the EU, all such records identified in the data have been excluded. However, some uncertainty in the recording of the partner ports of loading or unloading may influence the results. Due to some degree of uncertainty in the outwards data, all outgoing goods with an 'unknown' partner port have been excluded from the tonne-kilometres calculations on the assumption that this transport has been correctly reported as incoming goods by the partner country. Currently it has been considered appropriate to limit maritime freight transport to national and international intra-EU transport based on the assumption that inland freight transport (road, rail and inland waterways) is essentially performed on the territory of the European continent.

Similarly to maritime transport, Eurostat collects air transport data of cargo (expressed in tonnes) forwarded between airport pairs according to the relevant legal act. The legal act defines categories of airports according to the passenger units handled per year. Passenger unit is equivalent to either one passenger or 100 kilograms of freight and mail. Three datasets are defined according to different concepts: 'Flight Stage'; 'On Flight Origin Destination'; 'Airport'. Air transport data used for the calculation of tonne-kilometres are based on the 'Flight Stage' concept. Air transport, as analysed in this article, covers transport to and from any airports in the reporting countries with more than 150,000 passenger units annually. In order to calculate transport performance in tonne-kilometres for air transport, Eurostat is using a distance matrix that contains great circle distances (minimum distance on a spherical line) between airport pairs. The distance matrix contains as well a so-called 'territorialisation tool' that allows attributing the calculated tonne-kilometres to the countries overflown on the route. The distance for each country is based on its national airspace, which includes territorial waters of 12 nautical miles off its coast. The calculated ‘territorialised’ air transport performance is a concept intended to be used only for
comparing the transport modes’ activity at the EU or at a country level for the purpose of modal split. More information can be found in the relevant metadata on Eurostat website, here.

Data series on road, rail and inland waterways for the reference period from 2010 onwards (including some estimates done by Eurostat), used for the calculation of modal split are included as an annex in the Excel file downloadable under ‘Source data for tables and graphs’ below.

Definitions of terms used within transport statistics are available in the transport glossary and in the Glossary for transport statistics - 5th edition - 2019.

Context

The European Commission’s White Paper “Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system”, adopted in March 2011, states that the transport sector in the EU should use less and cleaner energy, and that there should be efficient networks. The White Paper adds that shifting transport to more environmentally sustainable transport modes should be encouraged.

There is a need for EU-wide data to monitor progress towards this goal. Recording modal shifts over time is therefore very important, and enables policy guidelines to be tailored more accurately.

Other articles

- Transport statistics introduced
- Transport statistics at regional level
- Maritime freight and vessels statistics
- Maritime transport of goods - quarterly data
- Maritime transport statistics - short sea shipping of goods
- Railway freight transport statistics
- Inland waterways freight transport - quarterly and annual data
- Inland waterway transport statistics
- Road freight transport statistics
- Road freight transport by type of goods
- Road freight transport by journey characteristics
- Road freight transport by vehicle characteristics
- Air transport statistics

Publications


Main tables

- Transport, see:

  Transport, volume and modal split (t_tran_hv)
Database
• Transport, see:
  Multimodal data (tran)
   Transport, volume and modal split (tran_hv)

Dedicated section
• Transport

Methodology
• Glossary for transport statistics - 5th edition - 2019
• Modal split of freight transport (ESMS metadata file — tran_hv_frmod_esms)
• Modal split of passenger transport (ESMS metadata file — tran_hv_psmod_esms)
• Volume of freight transport relative to GDP (ESMS metadata file — tran_hv_frtra_esms)
• Volume of passenger transport relative to GDP (ESMS metadata file — tran_hv_pstra_esms)
• Territorialised road freight transport (ESMS metadata file — road_tert_esms)
• Air transport performance (ESMS metadata file — avia_tp_esms)

External links
• European Commission - Transport - Marco Polo Programme
• Trans-European Network Executive Agency