



Department
for Transport

Port Freight Statistics: Background Quality Report

Introduction

All port freight statistics are published through the maritime and shipping series on the DfT statistics web page: <https://www.gov.uk/government/collections/maritime-and-shipping-statistics>.

In this publication

Section 1: Background to the statistics p2

Section 2: Quality assessment p5

- Relevance and user needs p5

- Accuracy and reliability p9

- Timeliness and punctuality

p16

- Accessibility and clarity p17

- Coherence and comparability

p18

- Trade-offs between output quality components p19

- Assessment of user needs and perceptions p19

- Performance, cost and respondent burden p20

- Confidentiality, transparency and security p20

Section 3: Summary and conclusions p21

This background quality report relates to the quarterly and annual [port freight statistics](#) for UK ports. The purpose of this document is to provide users of the statistics with information about the quality of the outputs, measured against different dimensions of statistical quality. It also provides information about how the department has responded to previous user feedback, as well as planned developments.

As a result, this document helps to demonstrate how the Department complies with the Code of Practice for Statistics.

For information about the release and the tables, including comparisons between the port freight series and other data sources, see the [technical notes and definitions](#).

Section 1: Background to the statistics

Using currently available data, around 95% of all goods entering and leaving Britain are moved by sea and the port sector directly contributes [£1.7 billion to the UK economy](#). Once factors such as supply chains are considered, the port sector's economic contribution to the UK [is estimated to be £5.4 billion per annum](#).

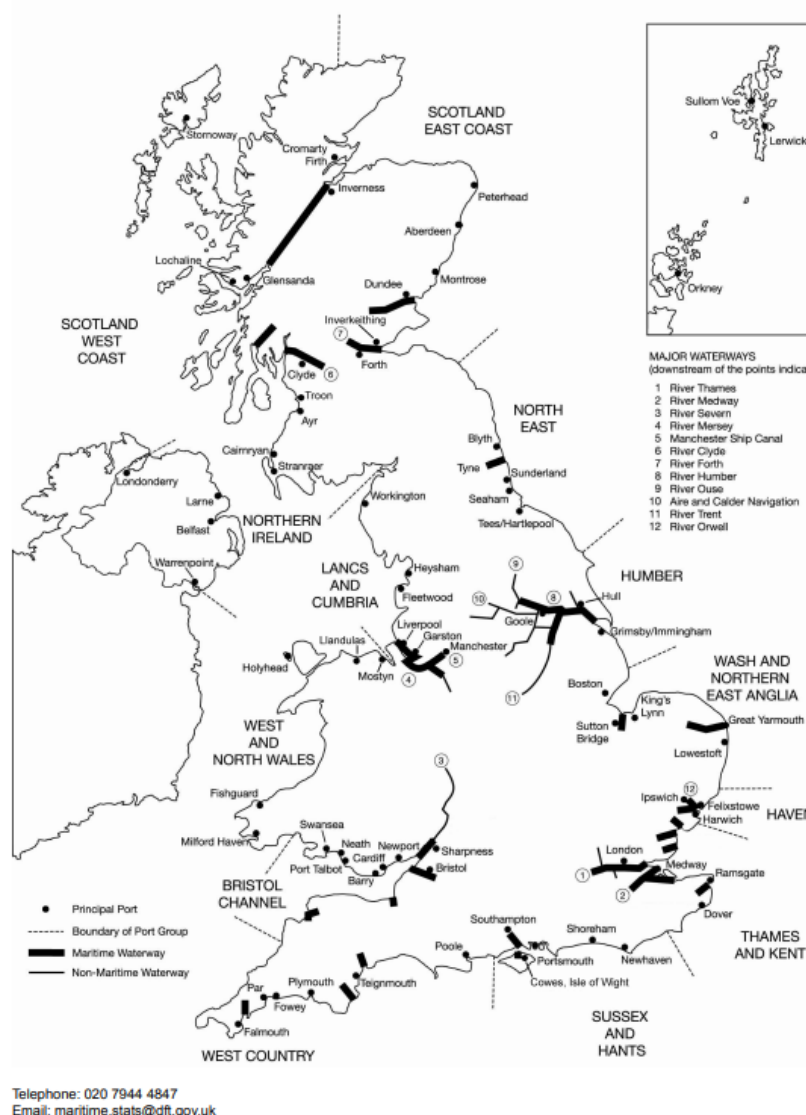
As an island our ports are fundamental to our global success as an outward-facing trading nation. The port freight statistics series produced by the Department for Transport helps to quantify and monitor the contribution of this critical industry.

Data are collected on all ports handling freight within the UK, on a quarterly basis. More detailed information is collected annually on ports handling over 1 million tonnes, as well as other ports of significance (these are classed as major ports in the port freight series).

This data is used to produce quarterly tables, detailing information on total tonnage and units by port, as well as an annual release in August of each year, which goes into detail of cargo types handled, and the routes taken.

Data are collected in line with [EU Directive 2009/42/EC - Statistical Returns in Respect of Carriage of Goods and Passengers by Sea](#). Our cargo categories are also directly from this directive to aid reporting to Eurostat, and can be found in Annex 2 of said directive.

Principal ports, port groups and inland waterways in the UK



Methodology and Production

Port freight traffic statistics are based on a combination of data reported to the DfT by port authorities and shipping lines or their agents. Prior to 2000 reporting was by port authorities only.

The current collection arrangements for port freight traffic statistics were introduced in 1 January 2000 to meet the requirements of the EC Maritime Statistics Directive (Council Directive 95/64/EC on statistical returns in respect of the carriage of goods and passengers by sea, recast as Directive 2009/42/EC).

Under the Directive, information is required quarterly on foreign and domestic tonnages and freight units, for major ports (i.e. those that have over one million tonnes of freight per annum) by route, flag and cargo type. Much less information is required for smaller ports.

Most of the detailed freight information is collected from shipping lines, operators and shipping agents, because the detailed route and ship flag information required by the Directive is only generally available from them. The ports supply more limited information quarterly and annually, which is used to provide control totals and also to publish more timely provisional results.

The full guidance for data providers is available via a dedicated section of the [DfT website](#), including the forms, instructions for their completion and code lists.

Shipping lines and agents information (form MSD1)

Shipping lines or their agents complete detailed returns of their inwards and outwards traffic at each major port for each ship, on each route, quarterly, on form MSD1.

Major ports are those handling more than 1 million tonnes a year, plus a few selected ports with less tonnage. The returns give the gross weight of goods in tonnes of liquid bulks, dry bulks, unitised traffic and other general cargo, by individual category.

Additionally for unitised traffic, the returns give the numbers of units, broken down where appropriate into those with cargo and those which are empty. A full list of the cargo categories, and a comparison with the categories used in the previous system, can be found in the [technical note](#).

Ports information (forms MSD2, MSD2X and MSD5)

The port authorities or other undertakings at major ports complete quarterly (MSD2) returns comprising four figures: the gross weight of goods inwards, the gross weight of goods outwards, the total number of units inwards and the total number of units outwards.

Units include containers, road goods vehicles, passenger cars, unaccompanied trailers etc. Results from the MSD2 returns have been used since the beginning of 2009 to produce provisional quarterly port freight statistics which are published via the DfT Transport Statistics website.

More cargo details are supplied annually on form MSD2X, which uses the same cargo type categories as the MSD1. The MSD2X results are used to provide more detailed grossing totals for the final annual results, and are also the basis of the provisional annual results published about 6 months after the year end on the DfT Transport Statistics website.

Minor ports provide information on total tonnages in and out, annually on form MSD5. Ports also provide quarterly returns listing the shipping agents, lines and operators active at the port (MSD3) and giving data on ship arrivals and departures (MSD4).

As of April 2019, the data collection for the port freight statistics is handled in-house by the Department. Prior to then, the data collection was handled by the Department's collection agent who initially received and checked the data before sending it on to the Department. The current collection process is essentially unchanged, the only difference being is the Department receives the data from ports and agents directly, rather from the collection agent. The current process is outlined below:

Quarterly data collection

- ▶ At the end of every calendar quarter, ports and shipping agents are required to submit data on freight handled for that quarter;
- ▶ Agent data is recorded at the level of an individual ship moving between two ports (form MSD1). If the same ship makes multiple journeys on this route however, it can be aggregated into a single row for that quarter, with the total number of voyages given. This is reported on a minimum quarterly basis;
- ▶ Port data contains the total tonnage and units of freight that passed through the port during that quarter, as well as whether the direction of travel was inwards or outwards (form MSD2);
- ▶ Non-respondents receive reminders from the Department;
- ▶ Once data is received, it is checked by the Department for accuracy. The MSD1 and MSD2 form are checked together in an attempt to identify missing or miscategorised data when the data is submitted. Any discrepancies are resolved before being approved by a senior member of the team, who will check not only the numerical accuracy but also the presentation of the report;
- ▶ Each quarterly release is published three months after the end of the quarter (for example, Q1 2019 which relates to January to March 2019, was published in June 2019).

Annual data collection

- ▶ At the start of January, all major ports have to submit an annual report form (known as MSD2X) in addition to their regular quarterly return. This collects total tonnage and units (loaded, empty, and total) for a set of cargo categories;
- ▶ Non-respondents are chased up by the Department;
- ▶ The Department conducts extensive checks:
 - ▶ MSD2X forms are compared to the four quarterly MSD2 forms to ensure that totals match;
 - ▶ MSD2X forms are compared to the quarterly MSD1 forms to try to identify miscategorised or missing lines;
 - ▶ Domestic port-to-port flows from the MSD1 are compared in both directions ("mirror checks") to identify errors.
- ▶ The data is also checked by looking at long term trends, and comparing the resultant trends with news articles and published stories to check consistency. Comparisons are also made with other sources of data where this is available at this point, including HMRC data by port (for

non-EU cargo), BEIS energy statistics (for oil and gas cargos) and DfT Ro-Ro statistics (Ro-Ro cargo).

- ▶ The final data is used to produce the annual port freight release and tables, before being checked by a statistician. Any discrepancies between the release and the tables are resolved before being approved by a senior member of the team, who will check not only the numerical accuracy but also the presentation of the report;
- ▶ The annual port freight release and tables are published around the end of August.

Section 2: Quality assessment

In this section, the quality of the statistics is considered in relation to the different dimensions of quality as stated in the [European Statistical System \(ESS\) quality framework](#).

1. Relevance

Relevance is the degree to which a statistical product meets user needs in terms of content and coverage.

The statistical outputs presented within port freight statistics include:

- ▶ A [statistical release](#) containing key findings, trends over time and signposts to further information and related datasets;
- ▶ ODS [data tables](#) containing information on freight passing through UK ports, as well as the number of ship arrivals, and the registered countries of ships transporting freight to and from UK ports;
- ▶ A document with [technical notes and definitions](#);
- ▶ A [PowerBI dashboard](#) which allows users to interact with the data with more freedom.

Known users and uses of the statistics

Within the DfT, the statistics are used:

- ▶ To inform maritime policy, both in terms of ports as well as international trade. Examples include:
 - ▶ The [Transport Connectivity to Ports](#) review of the current status and future infrastructure recommendations;
 - ▶ The [Maritime Growth Study](#), reviewing the opportunities and challenges faced by the UK with regards to its position as a leading maritime centre;
 - ▶ The DfT planning for, and [responding to](#), the [Network and Information Systems \(NIS\) Directive](#);
 - ▶ The [Ports Good Governance](#) guidance;
 - ▶ The [Maritime 2050 strategy](#), providing a full long-term strategy to inform the government approach with the sector.
- ▶ To assist maritime economists and analysts. Examples include the work for the relevant Brexit [sectoral reports](#);
- ▶ To assist with [forecasting ports and traffic](#) in the UK maritime sector.

Outside DfT, known users who have either published material based upon our statistics, or who have used it for their own work, include:

- ▶ Research analysts, such as the [Freight Transport Association](#);
- ▶ Maritime sector associations, such as the [UK Harbour Masters Association](#), the [UK Major Ports Group](#) and the British Ports Association, for example in [briefing](#) and [promotional work](#);
- ▶ Specific port authorities and corporations, such as [DP World](#), the [Association of British Ports](#) (ABP), and the Port of London Authority (PLA). These statistics cover the entire sector so allow the relative ranking of specific ports to be assessed (for example in [news articles](#))
- ▶ University researchers for either their research work, or dissertations/theses;
- ▶ Organisations interested in news and statistics, for example a relatively recent article by [Full Fact](#) and a link from a [BBC news story](#);
- ▶ Other UK government departments, such as [HMRC](#), the [Department for Business, Energy and Industrial Strategy \(BEIS\)](#), the [Department for Environment, Food & Rural Affairs \(DEFRA\)](#), and Transport Scotland.
- ▶ Other national governments, such as the [Republic of Ireland](#).

How the department engages with users:

DfT regularly engages with users by social media, email and face to face methods when possible. This includes requesting feedback on the quarterly and annual statistics series, with contact details provided in every statistical release. Each publication is promoted via Twitter. DfT also regularly analyses web page hits, ad-hoc requests and social media analytics to monitor activity over time and identify which products are more useful.

In recent years, specific engagement activities include:

- ▶ Presentations to the Transport Statistics User Group and UK Harbour Masters Association;
- ▶ A user engagement exercise assessing how well the statistics meet user needs as well as data collection burdens and potential methodology changes was carried out in 2016, with a [summary of the results](#) published in March 2017.

DfT also published a [user feedback exercise](#) in March 2018 that sought user's opinions on the port freight tables that were published in the 2016 annual port freight release. The feedback from the exercise has been reviewed, where tables have been updated with respect to the feedback received.

In line with the Code of Practice for Statistics, users will be informed about any changes or revisions to the data series and given the opportunity to feedback prior to any changes being made. Proposed and recent changes are typically highlighted on the statistical release and collection pages on GOV.UK, such as combining quarterly port freight tables and not publishing a PDF report.

How well the statistics meet user needs:

Based on engagement as outlined above, we have received a range of feedback from users of the statistics. Overall, we understand that these statistics are generally considered to be fit for the purposes for which they are used. However, recent user feedback requests have resulted in some suggestions for improvement and areas of unmet needs.

Sometimes users are looking for the ultimate origin or destination of the cargo. Our data captures

the ports of loading and unloading, however this may not be the ultimate source. “[Transshipment](#)” is where cargo is offloaded on the portside by a vessel, and then re-loaded onto another vessel. This results in our statistics reporting the port of load as, say “Rotterdam” when the cargo may have actually originated in a completely different country. The Office of National Statistics [has previously attempted to quantify this effect](#), but there has been little impact made on this issue.

Feedback from the recent user engagement specifically related to the published data tables suggested that users:

- ▶ Found it difficult to identify the correct tables;
- ▶ Could not identify certain popular splits e.g. EU/Non-EU;
- ▶ Could not easily distinguish between major and minor ports; and
- ▶ Would like/prefer more filterable tables, like PORT0499.

Following this feedback, a clearer naming structure was created with a lookup to detail which breakdown was available in which table, along with a map comparing the old table structure to the new structure. In addition, some tables were consolidated allowing fewer tables to be published, with nearly all of the new tables having filters to allow the user to select the data they are interested in. Many also all contain the raw data which is open for use by the users, so that expert users can conduct their own analysis. The few tables which do not contain a separate data table already contain the lowest level data available.

As well as publishing an updated set of tables, the relevant [GOV.UK](#) webpages have been redesigned. Previously the port freight data tables were split across 6 separate webpages, one for each area of interest (e.g. port freight by tonnage, port freight by unit). Now with the consolidated collection of tables these are all published on a single page, with the full table name in the link (as opposed to just the title, PORT0204 for example).

The following table summarises some of the recent user feedback in relation to these statistics, along with action taken or proposed:

User said...	Action
100% of responses “completely happy” with the proposal to reduce the number of tables and include filters to help users find the data they want with one user saying “any means of formatting which allows me to filter more quickly is welcome”.	We implemented the new tables approach in the August 2018 annual port freight release.
One user noted an EU filter specifically would be extremely useful.	A “region” filter has been added to many tables, which can be filtered to return “European Union”.
Only one user printed the tables, others mentioned manipulating the format before distributing or running a pivot table off of 0499 to analyse annual trends.	The team had concerns that users wanted to easily print tables (based on previous feedback) and that filters would make this more difficult. The consultation suggests that printing is not high priority to most users, therefore adding filters will not be a problem in this regard, the benefits outweigh the difficulties in printing.

User said...	Action
Two users, a consultant and a port, specified that splitting freight carrying units from non-freight carrying units in the tables and ideally in the quarterly, to be consistent with presentation of port data globally. This is consistent with feedback provided previously.	<p>We have made the split between freight carrying units from non-freight carrying units in many of our tables. In some, we have also aggregated up “main freight units” into a single figure to aid users finding a number quickly.</p> <p>To be done:</p> <p>We could ask minor ports to also provide the total number of units passing through their port. It remains to be seen if this would be asked annually, or every few years. This decision would be made based on a benchmarking survey, and taking into account feedback by ports.</p> <p>We have begun collecting freight and non-freight on a quarterly basis from major ports and will assess the quality of this information with a view to publishing if the quality is good enough by the end of 2020.</p>
One user mentions TEUs are more helpful than units.	TEUs have been included in most tables involving containers. There is scope to expand and offer this filter in more tables.

Work done to develop these statistics since August 2018:

A summary of what has been done since last year is below:

- ▶ Brought the data collection in-house by the end of April 2019. This has allowed us to modernise the collection and streamline data validation.
- ▶ Developed a website for the collection of agent and port data, which includes basic checks when data is inputted, which includes a cargo description box for users to enter to improve validation.
- ▶ For the 2018 statistics in August 2019, we have:
 - ▶ combined separate releases on port and domestic waterborne freight to provide a more coherent single release;
 - ▶ added more detail on the users and use of the statistics up front;
 - ▶ ensured that relevant information related to any caveats in the statistics is included at relevant points throughout the release;
 - ▶ published a [PowerBI dashboard](#) to allow users to explore the port freight data further;
 - ▶ reviewed the published arrivals statistics (switching to a new data source to reduce data collection burdens, and improving the presentation for example reporting for the same ports as shown in the port freight tables).

Future work to develop these statistics:

Given what has been achieved in the most recent release, DfT plans to continue further developing the port freight statistics in response to user feedback. Below is a summary of planned

developments for the next year (2020).

- ▶ Bring the publication date forward to June as a result of bringing the data collection in-house.
- ▶ Seek to improve the usefulness of the quarterly statistics, by separating freight and non-freight units as requested by users (subject to being able to collect data robustly). We will look to publish experimental tables by end 2019;
- ▶ Further explore comparisons between the port freight statistics and other trade statistics (such as HMRC, DUKES, etc.);
- ▶ Conduct a user feedback survey into how non-regular users of the port freight statistics series are accessed and used, assessing if the statistics can be made easier to use;
- ▶ Analyse and review the data collected for freight and non-freight unitised cargo collected on a quarterly basis from major ports, in response to user feedback.

Of course plans are subject to change depending on circumstances, including any further feedback from data suppliers or users, as well as external events impacting on the legislative framework for data collection. We will keep the above updated to reflect current plans.

2. Accuracy and Reliability

Accuracy refers to how close the estimated value in the output is to the true result.

These statistics aim to provide a true picture of the movement of freight in and out of UK ports. To this end, there are a number of checks that take place during the collection, data processing, analysis and publication. While it is not possible to quantify the accuracy of the statistics, the results of checks and comparisons with other sources give us confidence that overall the results are sufficiently accurate at the aggregate level, though there may be issues at a more detailed level.

Quality management approach

The following summarises potential sources of risks or errors which may arise throughout the process of compiling the port freight statistics.

Error	Source	Mitigation	Error identification	Corrective actions
Data provider fails to submit a required form	Data provider	Providers are all contacted at the start of the collection period to remind of requirements	Comparison of received forms against a contact database	Email provider to provide form Call provider to identify issues and provide assistance
Information is submitted on the wrong form (for example, agent data provided on port form)	Data provider	Guidance provided for data providers on DfT website. New information email supplied to new data providers	Comparison of received forms against a contact database Sudden change in reported tonnage or units for that port/agent Sudden change in reporting patterns for port or agent	Email provider to provide form Call provider to identify issues and provide assistance

Error	Source	Mitigation	Error identification	Corrective actions
Lines of data missing from submitted MSD1 form	Data provider	Guidance available for data providers on DfT website. New information email supplied to new data providers	MSD1 vs MSD2X checks show large differences Time series checks reveals large changes	DfT contacts shipping agent to investigate missing data
Cargo is incorrectly categorised	Data provider	Guidance available for data providers on DfT website. New information email supplied to new data providers. Categorisation flowchart available to walk data provider through choice	MSD1 vs MSD2X checks show large differences Time series checks reveals large changes	Compare reported agent data to port data, to identify lines which could have been miscategorised. Contact data provider to seek resolution If cannot be resolved, apply corrections based on comparable source e.g. port annual totals can be split using agent reported totals, or agent reported totals can be grossed up to match the port annual totals.
The wrong port is given (e.g. Boston in the US as opposed to Boston in the UK)	Data provider	First part of the location code ("locode") contains the country. Guidance provided for data providers on DfT website	MSD1 vs MSD2X checks show large differences Time series checks reveals large changes Unusual route/cargo combinations identified	Compare reported agent data to port data, to identify lines which could have been miscategorised. Contact data provider to ask if they are sure
Data incorrectly imported to the database	DfT	DfT data import instructions	Data validation checking spreadsheets highlight errors Time series reveal large changes	Drop offending rows/tables from the database Reimport data
Numerical errors in data tables	DfT	Tables are designed to automatically fill from a raw SQL output posted into the workbook, reducing the chances of human error	Quality assurance check of the table by the author, followed by checks by a senior statistician, who checks figures against the database as well as across different tables, and finally also look for trend anomalies	Correct the error Apply change to the table formulae/SQL query to reduce frequency of repeating the error Documentation updated to highlight errors which are easily repeatable

Error	Source	Mitigation	Error identification	Corrective actions
Numerical errors in statistical release	DfT	A log is kept of referenced statistics included in the release. Any statistics referenced directly from the database have the query and results table stored in a log	Quality assurance check of the release by the author, followed by checks by a senior statistician. These checks look to check figures against the database as well as the tables. Checks are also made of the narrative, ensuring it is consistent with media articles, other government publications, and realistic against previous trends.	Correct the error Apply change to the SQL query in the log to reduce frequency of repeat, where appropriate Investigate table or other source in case error is also present in the source Documentation updated to highlight errors which are easily repeatable

The largest source of difference in the data supplied to DfT is between the total data reported by the agents over the year, and the annual form reported by the ports – typically as a result of misclassification of cargo, or incorrect port codes. Extensive work is taken to reconcile the two records – this largely involves correspondence with the parties involved to explore, understand and agree amendments.

When no further reconciliation can be determined the agents data on their annual form is grossed up to the port's total annual figure to ensure that the totals match. Port totals are generally felt to be suitable for grossing as they tend to be stable over time (with any inconsistent trends being queried), complete and – in most cases – are likely to be based on data captured by ports for their own purposes. Where ports are unable to supply data in the precise form required, an estimation is made.

Another check which is conducted is a mirror check: where a cargo moves between two UK ports, the amount reported to have travelled out of port 1 can be compared to the amount reported to have travelled into port 2 from port 1. These should match, however in practice discrepancies are sometimes found. There are a number of possible reasons for this:

- ▶ Agents are typically only recording one side of the transaction (e.g. an agent handling specific ships coming into a port, being responsible for the cargo at only that port) so there is a natural asymmetry in accuracy that will result.
- ▶ Despite the number of checks that take place, it is possible that some rows of agent data will record a ship departing port A to go to port B, but without a corresponding report of the ship arriving at port B from port A.
- ▶ Similar to the above, some ships do not have exact destinations defined on departure, and instead make port calls based upon the purchase of the cargo. An example of this are some oil tankers. This is usually only an issue for international traffic, as for domestic traffic the ship is typically chartered before departure.

For domestic flows, an attempt is made to identify and resolve the largest discrepancies, through communication with the agents involved, though some remain after even after this takes place. Internationally, 'mirror check' comparisons are made by Eurostat (e.g. inwards tonnage from France as reported by the UK is compared with outwards traffic to the UK as reported by France) and whilst this is not used for validation, the results show that the quality of the UK figures is in line with, or better than, the EU average by available metrics.

DfT have a close working relationship with the data suppliers to ensure the quality of the data. [Guidance](#) is supplied to those who are responsible for providing data in order to ensure that this is as consistent as possible.

Grossing procedures

MDS2, MSD2X or MSD5 returns are normally received from virtually all significant operators. It is not possible to measure the response rate for MSD1s except by comparing the resulting traffic totals with those from the MSD2 or MSD2X returns.

The MSD2X data from ports are used as control totals to gross up the information supplied by shipping lines and agents data, that is make an estimated adjustment to correct for any missing MSD1s. Each of the data variables for each port on the MSD2X, i.e. the cargo categories for unitised and non-unitised traffic (see table above) are divided by the corresponding estimates provided by shipping lines and agents to produce grossing factors.

These factors are then applied to all corresponding MSD1 data variables to provide grossed totals. This method allows the estimation of other variables, for example traffic by cargo type by port of loading and unloading, vessel characteristics, flag etc, which are unavailable from ports from the MSD2 or MSD2X. The grossing procedure applies to traffic to and from major ports; information for minor ports is added in separately.

Statistics on the differences encountered in the 2018 data validation process, as well as the grossing factors applied, are summarised on the next ap.

Statistics on the differences encountered in the 2018 data validation process, as well as the grossing factors applied, are summarised below.

	Number of major ports reporting	Total weight reported on MSD1 forms (million tonnes)	Published estimate after grossing (million tonnes)	Implied grossing factor
2008	52	493.1	548.1	1.11
2009	52	455.8	489.6	1.07
2010	52	463.5	498.5	1.08
2011	51	484.2	507.0	1.05
2012	51	484.5	489.5	1.01
2013	51	479.5	491.8	1.03
2014	51	474.2	491.9	1.04
2015	51	466.2	485.7	1.04
2016	51	449.4	472.8	1.05
2017	51	461.8	470.7	1.02
2018	51	469.3	472.1	1.01
2018 results for specific traffic types (major ports)				
Inwards	51	298.6	302.2	1.01
Outwards	51	170.6	169.8	1.00
Liquid Bulk	51	177.6	184.2	1.04
Dry Bulk	51	92.7	94.0	1.01
Other General Cargo	51	17.0	17.9	1.05
Lo-Lo (Containers)	51	70.1	68.5	0.98
Ro-Ro	51	111.8	107.6	0.96
Domestic	51	88.3	88.9	1.01
Short Sea	51	267.9	269.4	1.01
Deep Sea	51	112.8	113.5	1.01
Major Ports	51	Smallest implied grossing factor among ports		0.86
	51	Lower quartile (port 14 of 51)		1.00
	51	Median		1.00
	51	Upper quartile (port 39 of 51)		1.05
	51	Largest implied grossing factor among ports		1.12

Publication arrangements and provisional results

Port freight statistics are published in two stages in order to put usable information in the public domain as early as possible:

(1) Provisional quarterly results are published approximately 10 weeks after the end of the quarter to which they relate. These statistics are based on the MSD2 forms provided by major ports. Data are available for total weight of goods and number of units, inwards and outwards for each responding port. These figures may be subject to revision if subsequent checks against MSD1 data provided by agents or MSD2X data provided by ports at the year end highlight anomalies. Typically a very small number of ports do not provide data in time for publication, in which case the national trend is estimated based on the trend for those ports which have provided data for the latest quarter. The table below shows how the published quarterly indices for traffic at major ports have

changed in each successive quarter since Q1 2009. This illustrates the overall effect at national level of changes to the provisional figures after their initial publication.

(2) Final detailed results are published about 8 months after the year end. These statistics are based on the MSD2X and MSD5 returns provided at the end of the year by each major port and minor port respectively. A split into broad cargo type is available for each major port.

At this stage a full reconciliation of port and shipping agent data will have been carried out, and full checks of MSD2/2X data against MSD1 data from shipping agents, and grossing of the final data completed and checked. The detailed results are based on this grossed data. At this stage the full range of analyses, including those by route and vessel type are available.

Variation of port traffic indices in successive editions of Quarterly Port Statistics

Four quarter rolling total, index value (Q4 2000 = 100)									
Total Tonnes Index									
Index Publication Date	2017				2018				2019
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
June 2017	85.2								
September 2017	84.9	84.9							
December 2017	85.0	85.1	84.9						
March 2018	84.9	84.9	84.5	84.3					
June 2018	85.0	85.1	84.8	84.6	83.8				
September 2018	85.0	85.1	84.9	84.7	84.0	83.6			
December 2018	85.0	85.1	84.9	84.7	84.0	83.6	83.4		
March 2019	85.0	85.1	84.9	84.7	84.0	83.6	83.4	84.6	
June 2019	85.0	85.1	84.9	84.7	84.0	83.6	83.4	84.7	86.0
Total Units Index									
June 2017	116.2								
September 2017	117.0	116.5							
December 2017	117.0	116.7	116.3						
March 2018	117.0	116.7	116.3	115.9					
June 2018	117.3	117.3	117.2	117.2	116.4				
September 2018	117.4	117.4	117.3	117.3	116.7	115.6			
December 2018	117.4	117.4	117.3	117.3	116.7	116.0	115.2		
March 2019	117.4	117.4	117.3	117.3	116.7	116.0	115.2	114.7	
June 2019	117.4	117.4	117.3	117.3	116.7	116.0	115.2	114.8	115.5

Known accuracy and reliability issues

Despite the above validation work, there remain a number of known issues which are believed to impact on the accuracy of the published statistics, to some extent.

These include:

- ▶ A potential under-reporting of some cargos on some routes. Further details are given in the [technical notes](#) based on a comparison of different sources, including energy figures published by BEIS. While in many cases correspondence is close, there are possible issues related to under-reporting of crude oil in particular.
- ▶ Estimation of cargo breakdowns for some types of unitised traffic (for example, containers of different sizes). Some ports are only able to provide totals, and splits are estimated from agent data where possible. This is unlikely to affect the overall trends or patterns shown for the main types of unitised traffic.
- ▶ Limitations in the published arrivals tables (as described in the technical note).

These issues are not considered to affect the overall fitness of purpose of the statistics for their main uses, though for more detailed analyses may need to be borne in mind by users.

Future plans to improve accuracy

The Department has brought the collection and validation of the port freight statistics in-house during 2019, and as part of this work has been reviewing the current collection methodology to see if improvements can be made to the accuracy of the data.

Planned work for the next year (2020) includes:

- ▶ Continuing to explore comparisons with other data, including drilling down to a more detailed level where the data permits (e.g. detailed HMRC trade statistics), to allow cross-comparisons of trends;
- ▶ The new system encourages suppliers to enter details of the specific cargo this allows more efficient validation of the data. Currently this is done manually, the next steps are to use code or machine learning to do this re-categorisation automatically;
- ▶ Using data on ship arrivals to improve validation of data as submitted through the year (e.g. to identify issues where port codes are used incorrectly). This includes work to exploit big data sources, such as AIS, working with the department's data science team.

3. Timeliness and Punctuality

Timeliness describes the time between the date of publication and the date to which the data refers, and punctuality describes the time between the actual publication and the planned publication of a statistic.

Port freight statistics are published quarterly, as well as a single annual release in August. Publication dates for these statistical releases are agreed at least 2 months in advance and dates are published on the [GOV.UK release calendar](#).

To date, all port freight statistical releases have been published to the scheduled pre-announced date.

Port freight quarterly release:

Quarterly releases are published a total of 10 weeks after the quarter they refer to. For example, the 2018 Q1 release (referring to January 2018 to March 2018) was published on the 13th June 2018.

The collection of the data commences at the end of the quarter in question. For example, the emails asking for data relating to January to March are sent at the end of March. Data providers have four weeks to supply their data, however the initial validations begin as soon as a return is received. If a return is not made within this period, two reminder emails are sent with a fortnight given to complete return. If at the end of this period there is still no return, DfT contacts the data provider directly with the aim of finding out the cause of the problem, and work with the provider to ensure the data is received. If this is not possible to collect in time, an estimate is created based of past data, which is then updated if the actual data is submitted.

Example of timescales for a port freight quarterly release:

Task Description	Timeline
Collection agent sends emails to request data	Week 0
Data is received from providers, and is checked by the collection agent	Week 1 – Week 4
First reminder emails sent to non-respondents. Validations continue.	Week 5
Final reminder emails sent to non-respondents. Validations continue.	Week 7
Tables are produced and then checked by a senior statistician. The release is written and then checked by a senior statistician, before the entire publication is given a final check by the head of division.	Week 10
Documents and tables are finalised and sent to web team for publication.	Week 11

Port freight annual release:

The annual release is published in August, 8 months after the year to which it refers to has ended. For example, the 2018 release (referring to January 2018 to December 2018) was published on the 21st August 2019. We plan to publish earlier still over the next few years, following efficiencies in table production and the process overall.

The collection of the data commences at the end of the year in question. For example, the emails asking for MSD2X (annual port freight form) data are sent at the end of December. Data providers submit their MSD2X forms over the next 2 months. This data is then collated with the final quarterly

data submissions (annual quarterly and port quarterly) forms before the full validation can begin.

The data is then further validated by DfT, by looking at long term trends and comparing the data to expected movements (for example, based on news articles or other industry publications, or other statistical sources include HMRC trade data and BEIS energy statistics) to highlight issues, contacting the data suppliers with any queries to resolve.

Example of timescales for a port freight annual release:

Task Description	Timeline
Collection agent sends emails to request data	End of December
MSD2X forms are received with quarterly data being received	January, February
Validation checks on data are performed, where any issues with the data are followed up with the data suppliers to resolve. Once the data has been validated and DfT are satisfied with the quality, the data is signed off as correct.	March to June
Tables are produced and then checked by a senior statistician. The release is written and then checked by a senior statistician, before the entire publication is given a final check by the head of division. Documents and tables are finalised and sent to web team for publication.	June to August

4. Accessibility and Clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

Accessibility:

The outputs are published on the GOV.UK [DfT statistics page](#) in accessible formats:

- ▶ Statistical releases and are available as PDFs, which are made accessible to PDF/2A standard for those who use assistive technologies.
- ▶ Data tables are available in Open Spreadsheet (ODS) file format which can be accessed by using free available software. These tables include filters which work through ODS formatting, allowing users to find the data they desire.
- ▶ Tables also include the raw data in a worksheet, for those users who would prefer to manipulate the data themselves, and a 'metadata' sheet which provides any key notes and definitions related to the interpretation of a particular table

Clarity:

The statistical releases use plain language, in which technical terms, acronyms and definitions are defined where appropriate. The main findings are presented using a series of text, charts and maps, with maps used to show the distribution of ports as well as their primary cargo/ direction/ route breakdowns. High-level details of the strengths and weaknesses of the data are provided at the end of each statistical report for users who are interested in this, with further details in the separate technical notes for those who need this. It is intended that any information that relates

to the interpretation of the particular aspects of the bulletin is provided alongside the figures (for example, the 'Rotterdam effect' is noted in the section on routes by country).

In addition to the statistical releases, further [relevant technical documentation](#) is published, describing the collection process (and how it has changed), the grossing process and how ports are categorised. This document also features a more detailed comparison with other data sources for interested users.

5. Coherence and Comparability

Comparability is the degree to which data can be compared over time and domain. Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar.

Comparability:

Over time: The statistical releases mostly cover trends since January 2000, with some selected datasets going back to 1965. The current definitions and collection methodology relate to an EU Directive which was effective from January 2000.

Prior to 1988, data was only collected on ports within Great Britain. From 1988 onwards this was expanded to include ports in Northern Ireland.

In 2005, more accurate recording of container/shipborne port-to-port trailer movements meant that the 2005 figures were not directly reported as containers, and were instead reported under 'rail wagons, shipborne port-to-port trailers and barges' in 2005. This provides a break in the time series for load-on load-off and roll-on roll-off traffic. Further detail on the effect this had on the time series is detailed in the [technical notes and definitions](#).

The Department for Transport has used a collection agent since at least 2000, where the same agent also undertook the validations for DfT in 2014. However in April 2019, DfT brought the data collection in-house and now conducts all the validations.

By port: During the years that the series covers, many ports have transferred operations to other ports. However, these are mostly smaller ports which are aggregated up into "statistical ports" for publication. Therefore the effect on the trends for ports is negligible. The collection agent tracked these changes to ensure continuity since 2000, and now the DfT monitors these changes.

Coherence:

These statistics provide data on freight through ports; they are used alongside other statistics to help in estimation of the share of international freight to and from the UK that arrives by sea, as well as providing data used in the calculation of the share of domestic freight moved by water. For the 2018 statistics release (in August 2019), domestic waterborne freight was combined with the port freight release to improve the coherence of the report.

A summary of the different sources of freight data is available as part of the annual [Transport Statistics Great Britain](#) publication guidance.

There is known user interest in intermodal freight journeys; current work is being done by the road freight statistics team in DfT to estimate the share of road freight that moves to or from maritime ports. A summary of the initial work can be found as part of the latest [road freight statistics](#).

The [technical documentation](#) contains details of comparisons that are made with two other sources:

- ▶ [HMRC data](#) is used to validate long terms trends in cargo commodities, and to shed light on commodity breakdown that we do not have access to in our dataset. There is good correspondence between HMRC and DfT port freight statistics teams to understand the reasons for any differences, for example HMRC does not always clear the goods at customs in the same location as it entered/exited the country.
- ▶ The [Digest of UK Energy Statistics](#) is used to provide further context around crude oil, oil products, liquefied gas and coal transport and use. Most categories have good agreement with DfT port freight data, and these are detailed in the [port freight technical documentation](#).

In addition to the above, data is taken from the Eurotunnel operator (Get Link) website with regards to vehicle movements, however this is used purely for comparison in a single table of the annual release, and is not used for analysis.

The following four sections cover additional principles which Eurostat asks official statistics producers to comment on when reporting on quality.

6. Trade-offs between Output Quality Components

Trade offs between output quality components describes the extent to which different aspects of quality are balanced against each other.

The main trade-off is accuracy against timeliness. Data providers are given long periods to submit their returns to offset the burden, and have a full month where they are reminded twice. It is possible that quarterly publications could be a full month earlier if this timescale were shortened. However the risk is that publication would occasionally be missing data that would have to be imputed.

In order to allow us to report to Eurostat, cargo categories relate primarily to how the cargo is transported as opposed to what it is. This does however clash with user's perceptions of this categorisation. There is a potential for us to ask for more details on the cargo and thus make the statistics more relevant for users, however this is balanced against the burden on data providers, which is already considered moderate. This would increase the burden significantly, especially as there is no standardised approach for data collection, categorisation and storage within the maritime industry.

7. Assessment of User Needs and Perceptions

Assessment of user needs and perception covers the processes for finding out about users and uses, and their views on the statistical products.

The ways in which the department engages with users to determine their views is covered as part of the 'relevance' section above.

8. Performance, Cost and Respondent Burden

Performance, cost and respondent burden describes the effectiveness, efficiency and economy of the statistical output.

Both the quarterly and annual publications are produced using data supplied directly by ports, shipping agents, and shipping lines. This is gathered through a few routes, including an ASCII file upload, a GESMES-standard data file upload, and via a website.

The Department has developed a website to replace the previous system (iSDES) to make efficiencies within the collection and validation process. There are several in-built validation checks and guidance in the website to help ensure the data entered by providers meets the criteria needed for the purpose of this publication. Some of these checks include a simple historical comparison, and the validation of codes, such as the IMO number for a vessel. In the short run, this may increase burden on providers when supplying the data, however it means that there is less chasing up of potentially incorrect data from the Department which requires resources from both parties.

9. Confidentiality, Transparency and Security

Confidentiality, transparency and security refers to the procedures and policy used to ensure sound confidentiality, security and transparent practices.

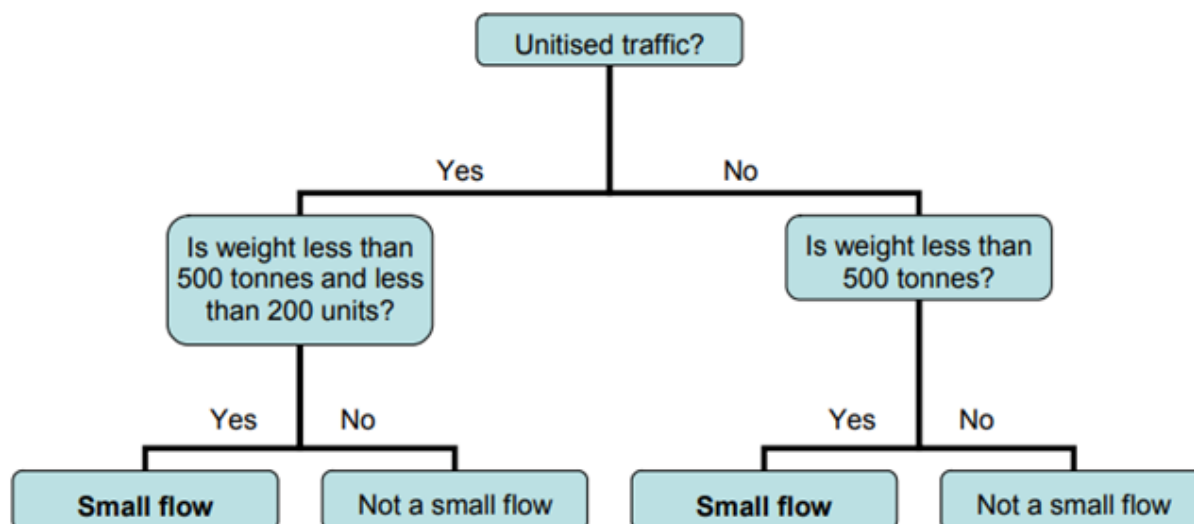
All data is stored, accessed and analysed using DfT secure IT systems. Data protection regulations are adhered to throughout the maritime statistics production process, and any information provided to DfT by agents, ports and shipping will be kept securely where access to data is controlled in accordance with departmental policy.

The information used to compile these statistics provides details on individual shipping journeys (i.e. ship IMO number, both ports, cargo categorisation, etc.) and so could reveal information that is commercially sensitive. An example would be where only a single company moves a particular cargo between two specific ports. If we were to publish details at this level we would therefore potentially be revealing commercial information.

The published statistics do not therefore reveal any private information about any organisation. To prevent this, we consider port-to-port data as sensitive and do not publish this to users outside of the department. In addition, when providing data concerning individual ports and countries of load/unload, we aggregate small movements of data as “small flows” to ensure that these cannot disclose commercially sensitive flows (see diagram on next page). This is still used for internal analysis, but is not made publicly available.

DfT aims to publish as much data as is possible whilst ensuring that confidentiality is maintained. In line with this, a table ([PORT0499](#)) containing high level port freight traffic between ports and countries are published alongside the annual statistics.

DfT adheres to the principles and protocols laid out in the Code of Practice for Statistics and comply with pre-release access arrangements. The pre-release access lists are available on the [DfT website](#).



Section 3: Summary and conclusions

This Background Quality Report presents information for users of the port freight statistics covering different aspects of their quality. The Department concludes, on the basis of the assessment outline above, that the statistics are of a quality which is considered fit for the purposes for which the statistics are being used.

Comments and feedback on this report, or any other aspect of these statistics are welcome, and can be provided by email to maritime.statistics@dft.gov.uk.

Further information

[Maritime and Shipping Statistics](#)

[Guide to Maritime Statistics](#)

[Port Statistics: Notes and Definitions](#)