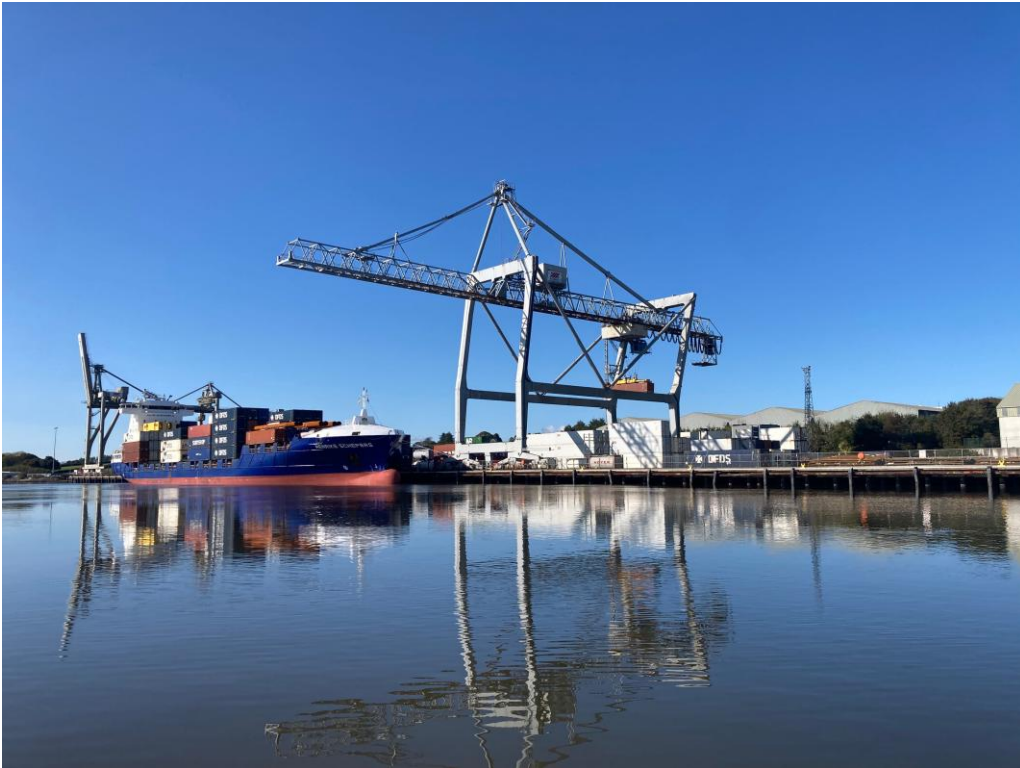


Port Operations Management



Blueskilling Project Taster Program
delivered by:

Deirdre Lane

FNI, MSC, MASTER MARINER

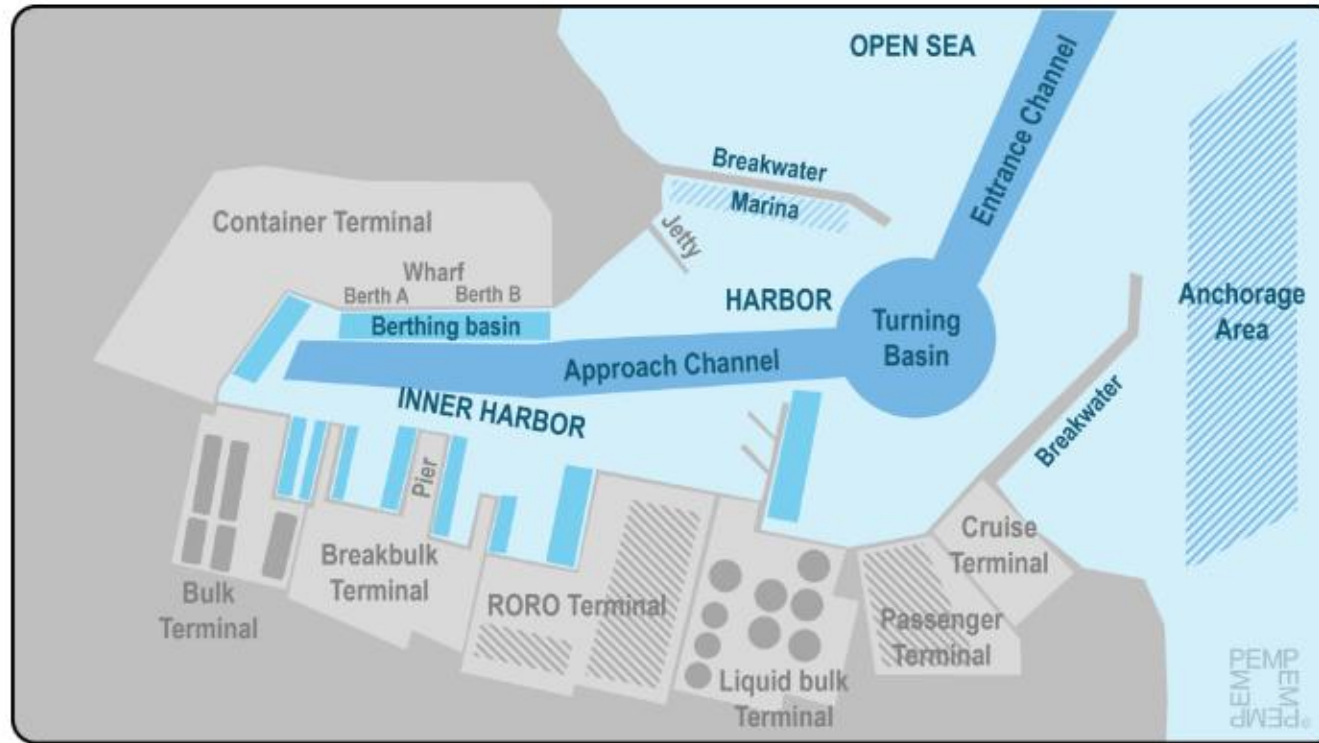


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Ports and Their Functions

- A Harbour is a place on the coast where ships can moor or shelter
- A port is a town or place alongside navigable water having a harbour with facilities for the loading or unloading of ships.

Source: Notteboom, T., et al., 2022. *Port Economics, Management and Policy*. London: Routledge



Main Physical Elements of a Port
Main Physical Elements of a Port | *Port Economics, Management and Policy*

Ports and Their Functions

- Ports facilitate trade, link a country's **hinterlands** overseas and boost economic development
- A logistical platform for technical, financial, innovative and economic functions
- Port Authority are the owners, corporation or persons entrusted with or invested with the power of managing a port, harbour board, harbour commission, local authority, marine department
- The port authority is responsible for the development of the port, the lease of land, port finances, spatial planning, intermodal networks and the ship to shore interface more commonly known as the marine operations

STAKEHOLDER

ANY INDIVIDUAL OR GROUP HAVING INTEREST OR BEING AFFECTED BY
PORT ACTIVITIES

Notteboom, T., et al., 2022. *Port Economics, Management and Policy*. London: Routledge



Castletownbere Fishery Harbour Centre- Source: DAFM

List the stakeholders?



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Castletownbere Fishery Harbour Centre- Source: DAFM

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MANY MANY Stakeholders

- Shareholders
- Customers
- Shipping Companies, Ship owners, ships crews and freight forwarders
- Ships' Agents
- Shipbrokers
- Fishing and recreational craft, their crews and owners
- Stevedores
- Employees
- Pilots
- Customs
- Immigration
- Emergency Services/ Coastguard
- Government Departments
- Third Level/ research
- Manufacturers
- Charters
- Transport Companies
- Commercial Customers and suppliers
- Commercial Offshore energy operators, aquaculture and other developers
- Local Authority
- Coastal Communities and the wider public

- Availability of a berth- JIT arrival
- Efficient Handling Operations
- Fast and efficient documentation processes
- Reliability
- Safety and Security
- Good quality Service
- Recreational facilities
- Parking facilities
- Good local agencies
- Good services
- Affordability

Support Services

Operators and service providers with diverse and complex facilities



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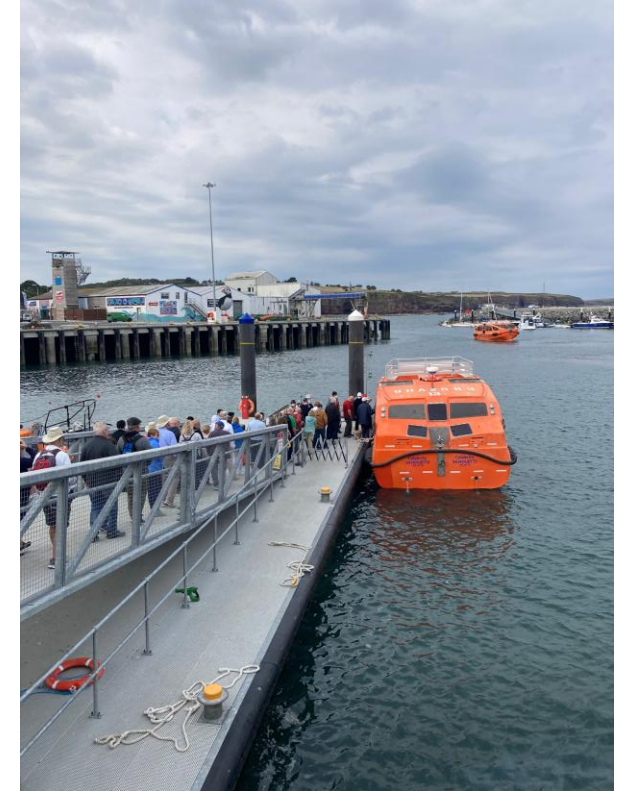
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- Land, warehousing and storage
- Distribution depots
- Maintenance and repair centres
- Repair facilities
- Boat Yard
- Traffic Management control
- Weighbridge
- Workshops/ Offices
- Vehicle parking and marshalling areas
- Security Services
- Driver accommodation and canteen
- Fuel Supplies

Marine Interface

Marine Interface allows the interactions between ship/ shore



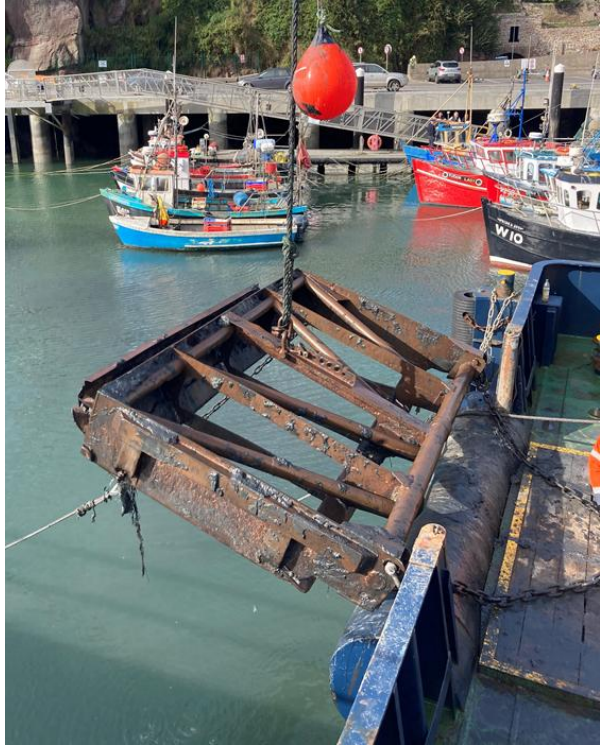
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Examples of Marine Interface

- Port Infrastructure, quays, wharfs
- Terminal Equipment depending on type of cargo
- Cranes
- Loading/ Discharging Equipment
- Conveyors/ Silos/ tanks
- Passenger transfer
- Crew Change
- Stores
- Water
- Fuel bunkering
- Repairs
- Leisure Activities
- Port Tenants

Marine Operations

Anything that happens from the ship to shore interface is known as marine operations



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- Port Control- Navigation
- Pilotage- Navigation
- Tugs- Navigation
- Dredging (maintenance or capital)/Ploughing –(Conservancy)
- Hydrographic Surveys- (Conservancy)
- Wrecks –(Conservancy)
- Aids to Navigation- Navigation/ (Conservancy)
- Pollution Control (legislation)
- Waste Control (legislation)
- Security ISPS (legislation)
- Harbour Tenants

- Local Port- Impacts local area
- Regional Ports- Limited to the regional hinterland
- National Ports- Used as logistical Platforms
- International Ports- High direct and indirect effects

How ports have developed

- First Port Generation- Interface location for cargo between land and sea
- Second Generation Ports- Relationship with transport and trade partners, activities are integrated
- Logistics optimizing all activities that ensures the delivery of cargo through a transport chain from one end to the other
- Third Generation Ports world-wide large scale containerization and intermodal transport combined with the growing requirements of international trade
- Fourth Generation Ports- Specialist independent terminals by private global operators
[Port marketing and the challenge of the third generation port \(unctad.org\)](http://unctad.org)

10 min Coffee Break



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Join at:
vevox.app

ID:
101-265-995



Indicate what you think are the greatest challenges for Port Ops today?

Technological Transformation

Rising Sustainability Expectations

Resilient Supply Chains

The Human Element

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⏩

RE-OPEN

□

INDICATE WHAT YOU THINK ARE THE...

2/2

⋮

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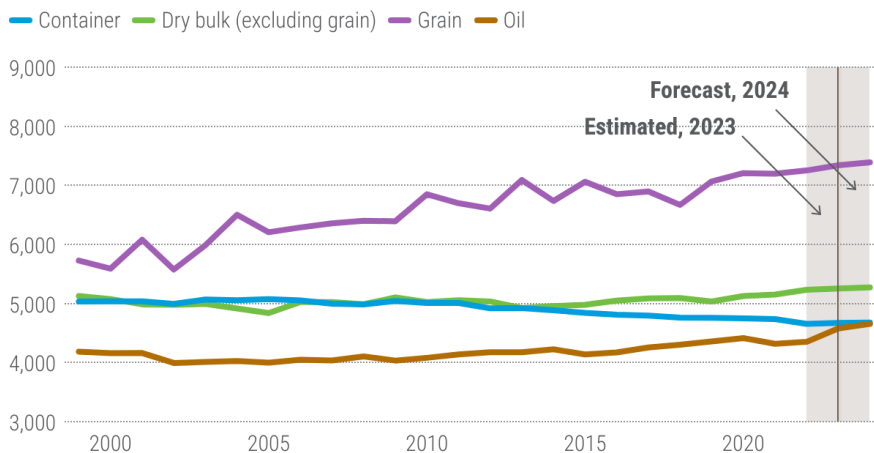
Group exercise

List the main drivers / trends impacting Ports and the Supply Chain



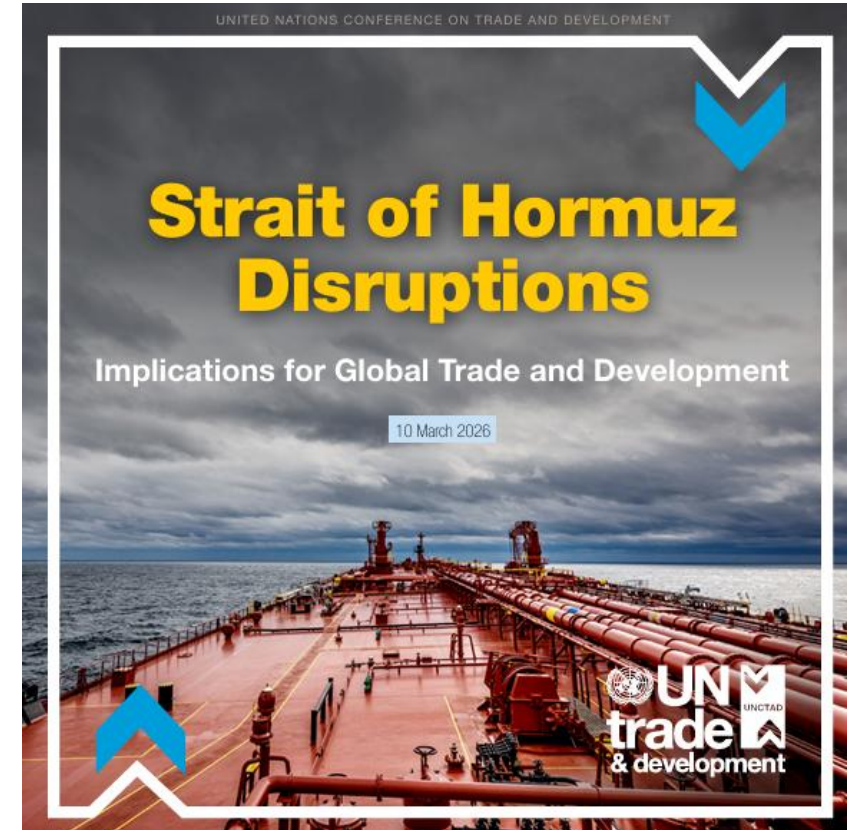
The war in Ukraine has increased shipping distances

Average distance travelled, nautical miles, 1999–2024



Note: The data for 2023 are estimates and for 2024 are forecasts.

Source: UNCTAD secretariat calculations, based on Clarksons Research, Shipping Intelligence Network timeseries (as of 8 June 2023)



https://unctad.org/system/files/official-document/osgttinf2026d1_en.pdf

Drivers / Trends impacting Ports

- Inflation
- Environment/ Energy Transition- IMO GHG 2030 target
- Security Concerns- Digital (port cyber attack) and physical
- Conflict
- Efficiency
- Competitiveness- Increasing ship size
- Sustainable Ports
- Technology- Block Chain
- Pandemic/ Natural disasters
- AI
- Organised Crime
- Containerisation
- Globalisation

[IAPH-Cybersecurity-Guidelines-version-1_0.pdf \(sustainableworldports.org\)](#)

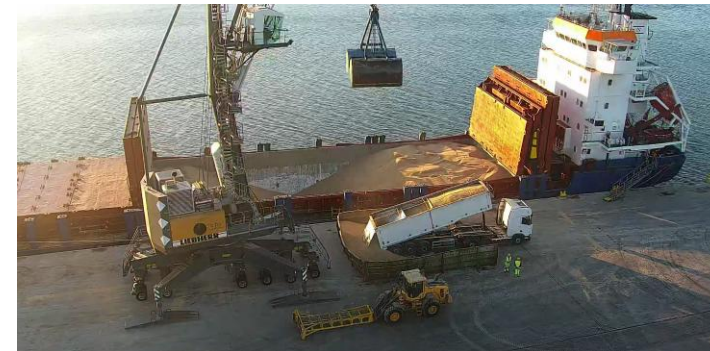
Individual drivers or “megatrends”

June 2021 study by Deloitte and ESPO, *Europe's Ports at the Crossroads of Transitions*

- Environmental
- Technological
- Geopolitical
- Demographic

Europe's ports at the crossroads of transitions - European Commission

Classification of Ships & Cargoes



Photos courtesy of Port of Waterford

Multi Modal Ports



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Multi-Purpose Ports/ General Cargo Ships

- Break Bulk
- Drums
- Bags
- Pallets
- Boxes
- Crates
- Cages

Storage Factor =
surface occupied by one
tonne of cargo



Photo courtesy of Port of Waterford

Container Terminal- Lo/Lo

- Quayside storage
- Support Services
- Cranage
- Mobile Handling Equip
- IT/ Software
- Control and tracking
- Access to transport network
- Multi-Modal- Rail?



Photo courtesy of Port of Waterford

TEU= Twenty Foot Equivalent Unit

Tare Weight= the weight of an empty container or vehicle

Container

Port of Waterford



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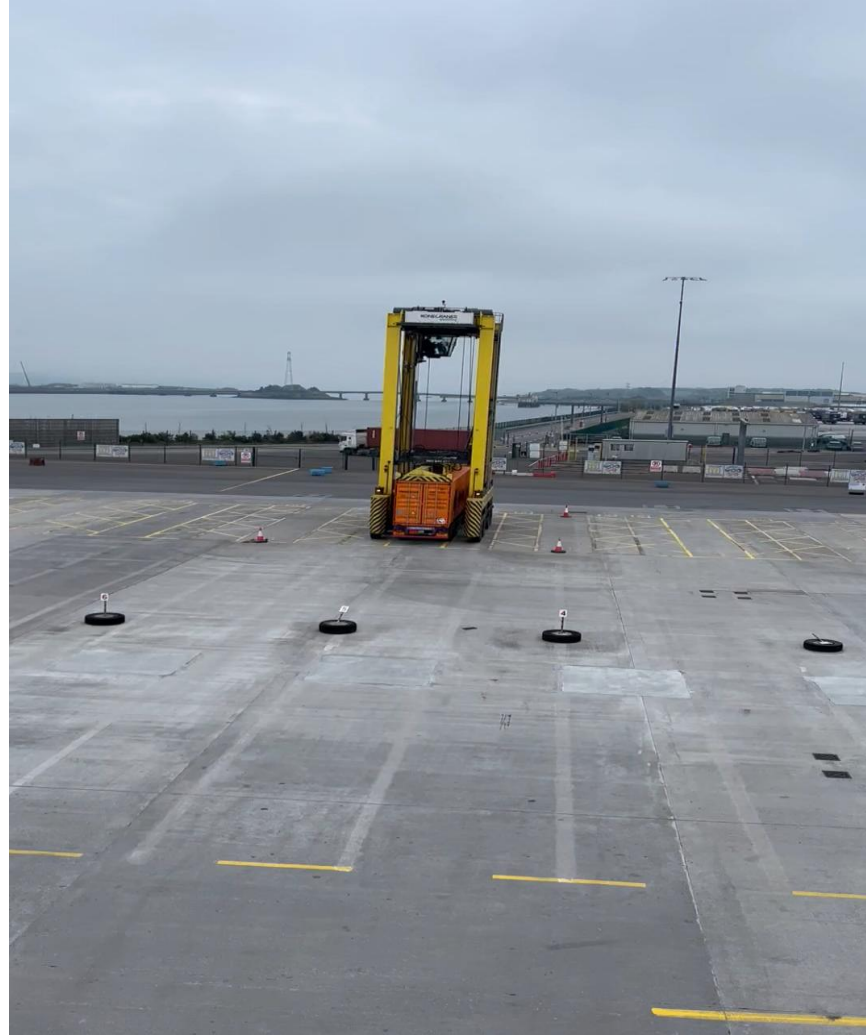


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Container

Straddle carrier @ Port of Cork



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Oil Terminal- Liquid Bulk

- Storage Tanks
- Pipelines
- Manifolds
- Fire Control Equipment
- Emergency Response
- Road Transport
- Support Services



Whitegate: Photo courtesy of Nevan Holland



Photo Courtesy of Bantry Bay Terminal

Dry Bulk

- Conveyors
- Cranes
- Grabs
- Plant and equipment
- Trucks
- Welfare Facilities
- Road infrastructure
- Stevedores
- Hoppers
- Warehousing/ Silos/ Storage



Photo Courtesy of Port of Waterford

Passenger Terminals- Ro/Ro

- Large Parking Area
- Space for storage
- Shelter
- Rapid loading and unloading
- Freight and Passengers
- Welfare Facilities
- Access to road network



Pont- Aven at Port of Cork

Ro Ro Shunters

With and without goose necks



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Categories of Cargoes Summary



Department
for Transport

Port Freight Statistics (last update December 2019) Categorisation Flowchart

What does the cargo look like?
How is the cargo carried on the ship?



**Load on-Load off
Container**

What is the size of the container?
*The cargo inside is not of interest here, but its weight.
Do not include the weight of the container.*

less than 20 foot containers
20 foot containers
40 foot containers
Freight containers between 20 and 40 foot in length
Freight containers over 40 foot in length

Liquid Bulk

What is it?

Liquidified gas, e.g. butane, propane and LNG
Crude oil. If weight is unavailable, 1 barrel of oil = 0.14 tonnes
Oil products (i.e. derivatives of petroleum), including diesel, gasoil, aviation fuel, reformat, gas condensate and benzene heat cut.
Other liquid bulk, **not related to petrochemicals** e.g. molasses, juices, ethanol, liquid fertilizer

Dry Bulk

(can be scooped)

What is it?

Ores and scrap, e.g. iron ores, metal scraps, rutile sand.
Coal, coke, coke breeze and coke foundry **but not coal by-products (e.g. gypsum, fly ash and slag).**
Bulk agricultural products, e.g. grain, soya or tapioca. Only grains **but not fertilizer or processed, grains (rape or soya meal/pellets) or animal feeds.**
Other dry bulk, e.g. coal by-products, ash, fertiliser products, cement, aggregates, wood pellets or wood chip **but not wood pulp.**

Roll-On Roll-Off

*(vehicle or other container
rolled onto ship)*

Only include the tonnage of the cargo, not
the weight of the vehicle/carrying unit

Is it self-propelled?
Was it transported on the vessel by itself?

Road goods vehicles with or without accompanying trailers, **not import/export motor vehicles**
Passenger cars, motorcycles with or without any accompanying trailers/caravans, **not import/export motor vehicles**
Passenger buses, which are not for trade.
Import/export motor vehicles
Other mobile self-propelled units, e.g. a mobile crane that is being moved but not traded.

Is it not self-propelled?

Unaccompanied road goods trailers and semi-trailers.
Unaccompanied caravans and other road, agricultural or industrial vehicles
Rail wagons, shipborne port-to-port trailers and shipborne barges. e.g. containers/cargo loaded onto MAFI's or lash barges. One MAFI loaded with cargo is recorded as one unit and the weight is entered.
Other mobile non self-propelled units, e.g. large industrial vehicles carrying goods which are pulled on to the vessel.

Other

(none of the above)

Live animals on the hoof
Forestry products, **including timber, paper and pulp (when shipped as break bulk).**
Iron and steel products, e.g. steel coils, uncoated metal pipes and strip but not manufactured products
Other general cargo (none of the previous categories or less than 20 foot containers). This includes any goods that are transported in bags, barrels, on pallettes, etc.

For more details, please check the complete
[notes and definitions](#).

Common miscoding errors!

- Check the content of the liquid bulk, not everything is "other liquid bulk".
- Bulk agricultural products (23) only include grains and not processed or fertilised.
- Wood pulp is a forestry product (91), not a bulk agricultural products or other dry bulk.
- Similarly, wood pellets and chip are considered other dry bulk (29).
- Check if the iron and steel is a product (92) or metal ore and/or scrap (21).
- Any vehicle being shipped for trade is 54.

Port Freight Statistics: Categorisation Flowchart (publishing.service.gov.uk)



Access and download a copy of the Master Plan for your nearest Port and using what you learned today, for the next lesson, tell me one Port Ops fact about your nearest port!