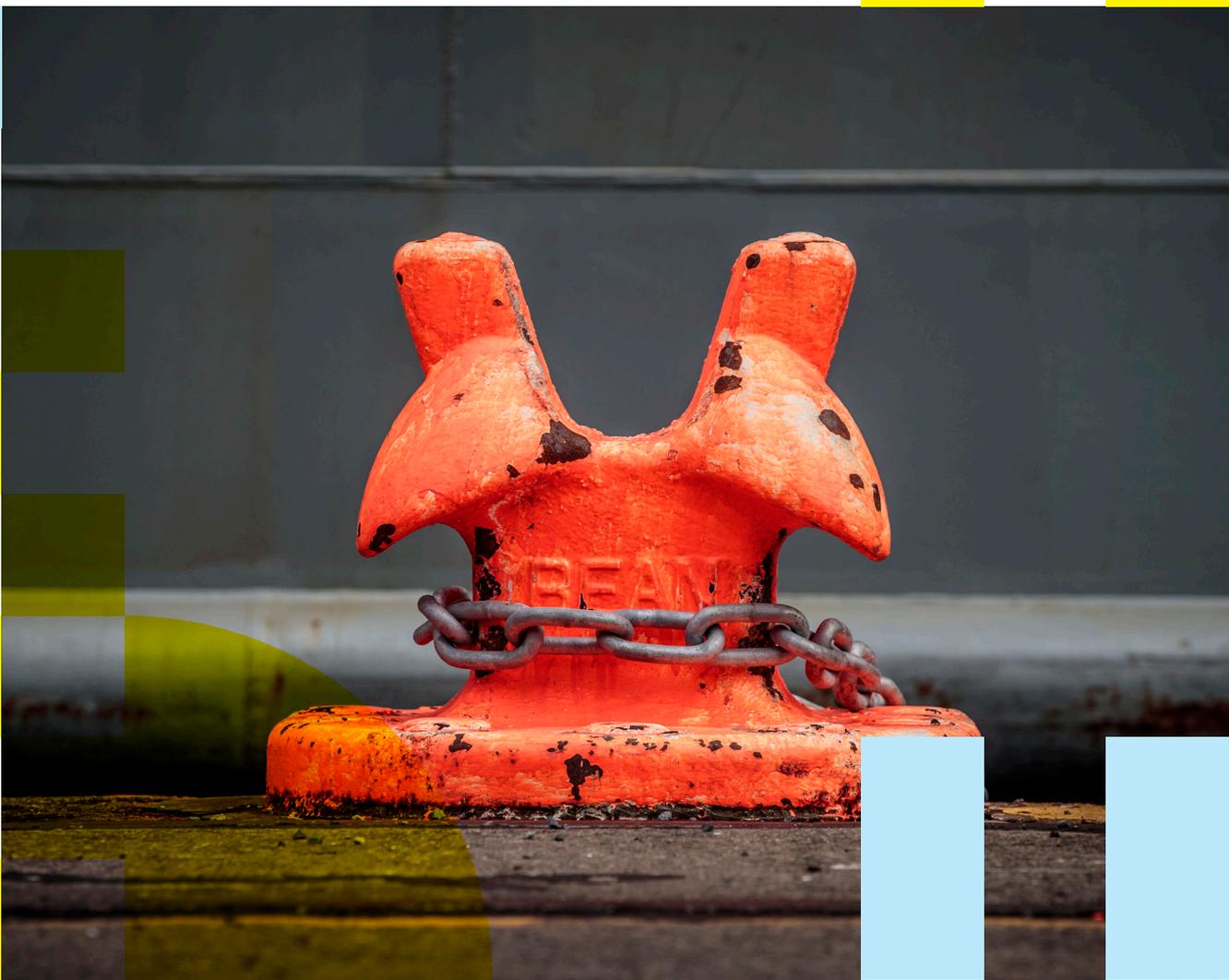


Environmental Impact Assessment Report

Appendix 2.1

Volume 3 Part 1



Irish Ports Capacity Study



Executive Summary



Executive summary

Scope

This study assesses the capacity within the port system to meet present and future demand over the period to 2040, as required in the National Ports Policy (2013)¹.

The Terms of Reference² for this work required consideration of the following:

- **Demand**
To prepare a forecast of the likely demand for Irish imports and exports (goods only).
- **Capacity**
To carry out an assessment of existing capacity and capacity to be added in the short-term, as well as future planned capacity of the Irish ports.
- **Connections**
To understand the importance of connections to the hinterland and how these support the ports.
- **Risks**
To profile the potential risks and threats to future capacity likely to affect the ports.

This study covers all the Irish ports categorised in the NPP as Tier 1 and Tier 2 ports, as well as those of regional significance, with the exception of New Ross. The study has also taken account of the port of Greenore, which is privately owned, and the Northern Irish ports of Belfast, Larne and Warrenpoint.

The ports assessed are presented in Figure I with their classification and 2017 throughput illustrated.

A key objective of the study is to develop a standardised approach to demand and capacity assessment for the Irish ports going forward. The baseline analysis was undertaken in 2018 using Eurostat data from 2017 and information received from the ports in June 2018.

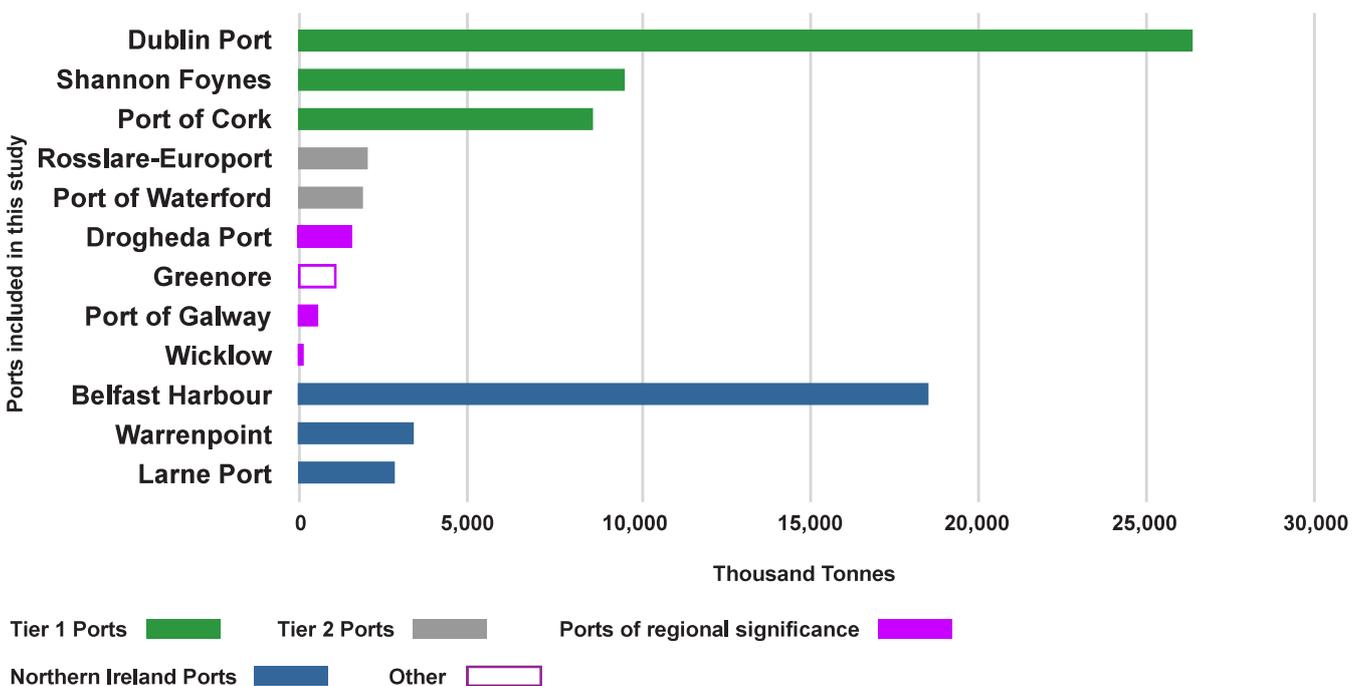


Figure I: 2019 throughput in thousand tonnes (Source Eurostat)

¹ National Ports Policy, 2013, Department of Transport

² See full Terms of Reference in Appendix 1

Overall approach

In order to analyse the capacity of the Irish Ports to handle the forecasted demand up to 2040, a demand forecast model has been developed. This assesses the likely throughput of trade goods over this period. The outputs of this model have been compared to the results of a capacity assessment undertaken for each of the Irish ports.

The key data sets used were the annual Eurostat Maritime Statistics mainly for the period up to 2017, supplemented by engagement with the port companies in June 2018 and the individual relevant Port Masterplans. Additional more recent data sets were provided by the IMDO and also extracted from the annual Eurostat Maritime Statistics where required for the assessments.

It has taken time to agree the methodology with all parties and stakeholders involved. Brexit has led to significant uncertainty. This report, therefore, presents different economic growth scenarios and can be adapted to take account of variable economic factors.

The approach followed is illustrated in Figure II. Based on site visits and data collected from the ports, separate demand and capacity forecasts were produced. These were then brought together into a single assessment for each port which allowed the identification of capacity gaps or surpluses. This assessment was undertaken for each of the four cargo modes: RoRo, LoLo, Dry & Break Bulk (dry and break bulk were combined to reflect the practice of using the same facilities to manage both types of cargo) and Liquid Bulk. The results of the capacity assessment were also benchmarked against other similar facilities worldwide. The individual port capacity assessments were combined to provide an assessment of the combined Irish ports capacity.

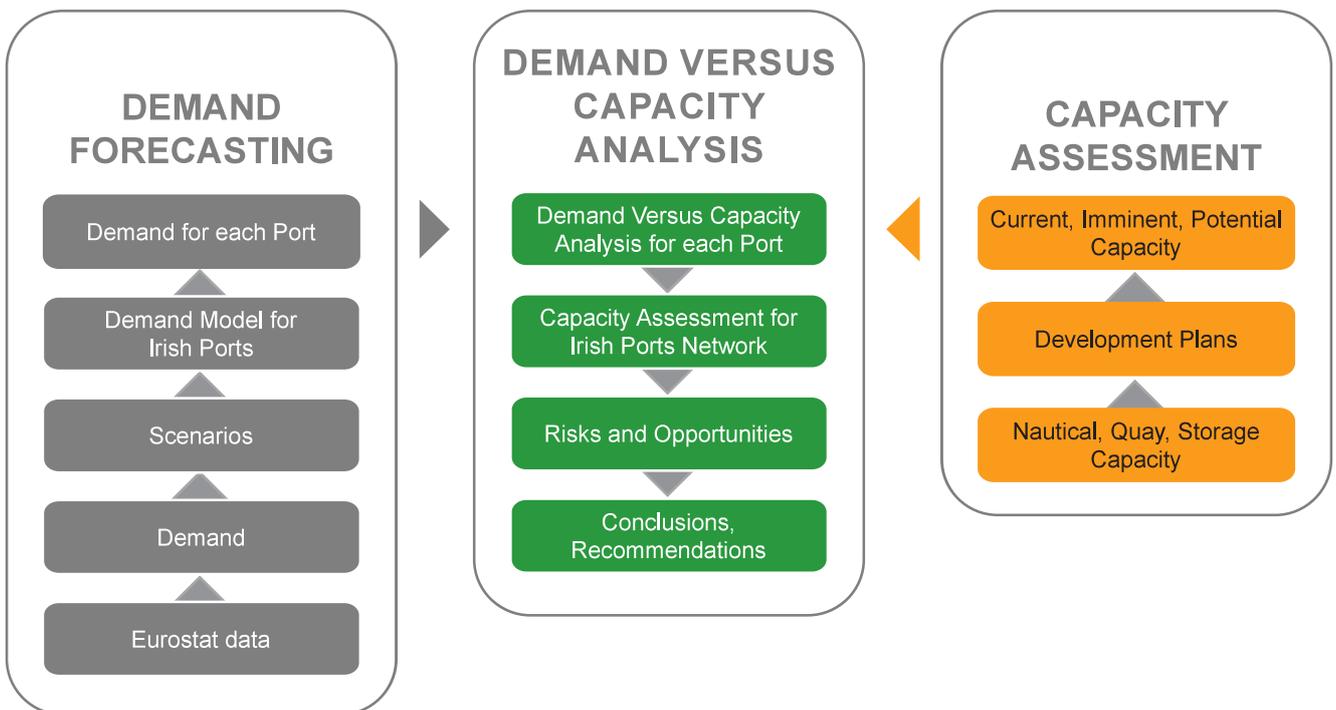


Figure II: Approach to the study

Executive summary

Demand forecasting

Eurostat data was used as the baseline input to the demand forecasting model in order to ensure a consistent set of data for ports in Ireland and Northern Ireland.

The demand model constructed is based on the finding that GDP (and, by proxy, private consumption) growth drives demand for imports and, in turn, for port capacity. The study found that there is a strong correlation between economic indicators, in particular GDP (and, by proxy, private consumption), and trade volumes.

GDP includes foreign trade. Therefore, this would not be independent of the trade forecasts. To avoid this problem of interdependence, a private consumption variable was used instead.

The key components of the demand forecasting model were:

- Volume forecasts**
 Used to estimate the throughput for each port. These were based on a demand approach which linked trade volumes to economic performance. Long run forecasts, provided by Oxford Economic Forecasting³, were then used to predict future economic performance and linked trade volumes.
- Scenario modelling**
 Due to uncertainties around Irish growth prospects at the time of forecast, and the impacts of Brexit, a total of three economic growth rate scenarios, as presented in Table I, were assessed.

	Average Growth
High	3.1%
Base Case	1.8%
Low	1.5%

Table I: Average annual growth rates scenarios

³ Oxford Economic Forecasting (OEF)

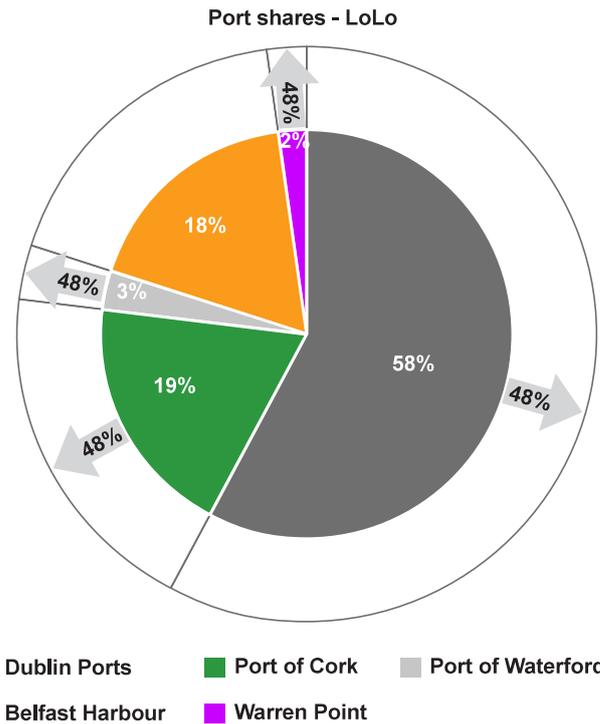


Figure III: LoLo - Example of constant port shares with 48% growth until 2040

Capacity assessment

The capacity assessment considered each of the four separate categories of cargo (RoRo, LoLo, Dry & Break Bulk and Liquid Bulk) with the following operational sub-systems:

- Nautical**
 From navigation access to berth.
- Quay**
 Goods movement from quay edge to storage.
- Storage**
 Capacity of container stacking yard / silos for dry bulk / tanks for liquids, etc.

The limited capacity of these three sub-systems is a constraining factor.

Hinterland connectivity also has an impact on the capacity of some of the ports studied. Where this is the case, connectivity constraints have been identified and assessed.

	RoRo-freight (‘000 units)	LoLo (‘000 TEUs)	Dry & Break Bulk (‘000 tonnes)	Liquid Bulk (‘000 tonnes)	Trade cars (‘000 units)	Passenger cars (‘000 units)
Dublin Port	1,459	1,397	3,554	5,155	319	515
Port of Cork	6	446	2,623	2,994	105	26
Shannon Foynes	-	-	3,352	870	-	-
Rosslare-Europort	235	-	82	-	57	273
Port of Waterford	1	75	2,354	-	-	-
Drogheda Port	-	-	1,380	40	-	-
Galway Port	-	-	258	655	-	-
Belfast Harbour	762	444	12,676	2,724	-	-
Larne Port	313	-	39	5	-	-
Warrenpoint	233	61	1,544	-	-	-
	3,007	2,423	27,863	12,443	481	814

Table II: 2040 demand forecasts by cargo type (Highest Growth Scenario, i.e. minimal impact)

The assessment considered three potential capacity stages:

- **Current capacity**
Defined as the port infrastructural configuration at the time of the assessment including projects that were under construction.
- **Imminent capacity**
Includes expansion projects or developments that have received planning permission, have secured financing and are in the process of being designed and constructed.
- **Potential capacity**
Includes potential expansion projects or developments planned in the longer term that are not yet formalised.

A high-level estimate was made for the expected timescale of each port’s planned capacity expansion in order to assess if it can be delivered in time to meet forecast demand.

Demand versus capacity analysis

The results of the demand forecast were plotted against the capacity estimation for each port and each cargo category.

For illustrative purposes, Figure IV presents demand versus capacity for Dublin Port LoLo.

Executive summary

	Units	Throughput 2019	Current	Capacity	
				Imminent	Potential
Lo-Lo	M TEUs/y	0.77	1.02	1.02	1.35

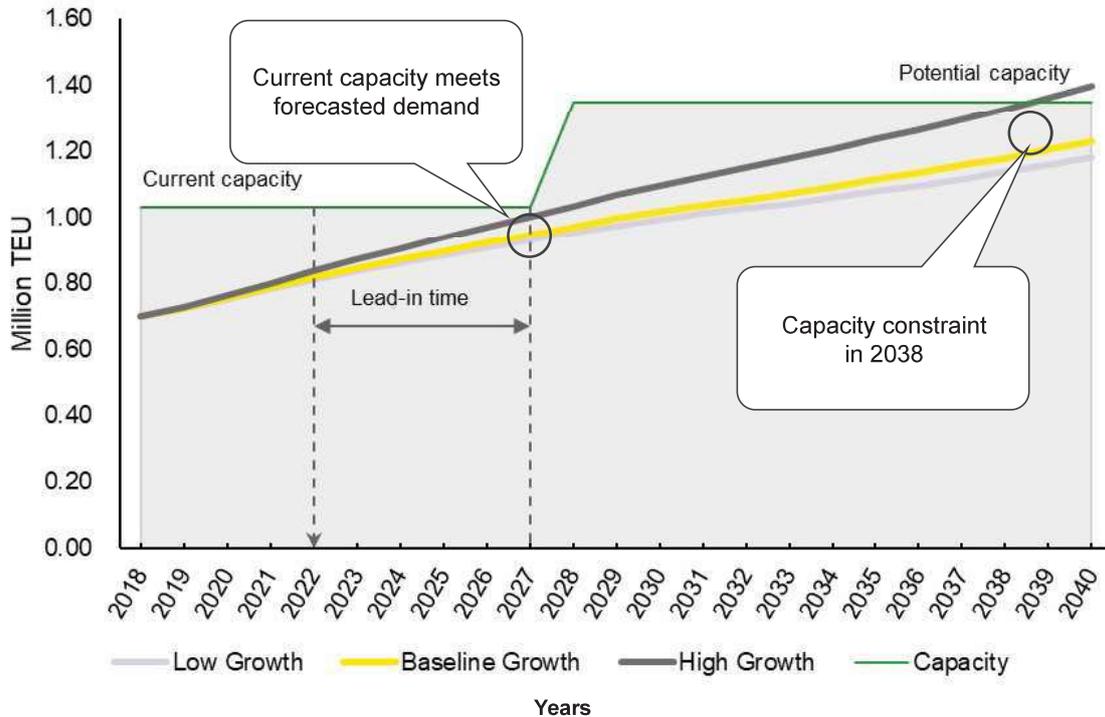


Figure IV: Dublin Port - LoLo – Demand vs Capacity

Figure IV shows the three different growth rate lines for LoLo demand. It also shows the current LoLo capacity in Dublin Port and the increase in capacity as a result of potential developments including the estimated lead-in time for these developments.

The assessment uses the highest growth scenario to show the earliest point at which capacity could be constrained.

The demand versus capacity analysis for each of the ports shows that the Irish ports generally have sufficient capacity to accommodate current and forecasted demand until 2040. The only exception is the LoLo capacity in Dublin Port which is estimated to run out of capacity around 2038 in the High Growth Scenario.

The lead-in time analysis shows that sufficient new capacity developments are planned and are mostly programmed to commence on time, although financing and planning consent difficulties may still cause delays.

Combined Irish ports capacity analysis

The Irish ports as a network

In order to provide an insight into the capacity of the combined Irish Ports to respond to the current and forecasted demand, the information from the capacity estimation for the individual ports was collated for each cargo mode.

Graphs were prepared showing the combined Irish ports system capacity development (for each cargo mode) versus the whole of the Island of Ireland demand and show that the combined Irish ports have, in theory, sufficient capacity to handle demand until approximately 2040.

Combined RoRo capacity

Most of the RoRo operations on the Island of Ireland are concentrated in Dublin, Rosslare, Belfast and Larne with smaller throughputs in Cork and Warrenpoint.

Figure V shows the combined RoRo freight capacity on the Island of Ireland.

Following the High Growth Scenario line in Figure V, it is shown that the available theoretical capacity in the network of Irish Ports can meet demand up until 2039. Nevertheless, the planned RoRo terminal extension in Dublin will allow for further growth around that time. During the second half of the 2030s, the network of Irish ports will be approaching capacity and so throughput may need to be spread to lower throughput terminals.

Dublin Port is by far the dominant RoRo freight port on the Island of Ireland and as ferry companies look to group their services

together, the demand in Dublin is expected to increase over time. Looking at the current Irish ports masterplans available, this dominance in RoRo is only set to increase with Dublin Port heading to circa 2M units/year RoRo freight capacity.

The Port of Cork has potential to increase capacity through additional sailings and Rosslare Europort has potential to increase its yard utilisation. Improvements in hinterland connectivity in these ports will be required to accommodate any surplus demand from Dublin Port.

In addition to RoRo freight, the network of Irish Ports has sufficient capacity to handle the forecasted demand until 2040 for passenger cars. In terms of trade cars, increased demand expected for trade cars across the Island of Ireland may cause capacity constraint problems by the mid-2030s.

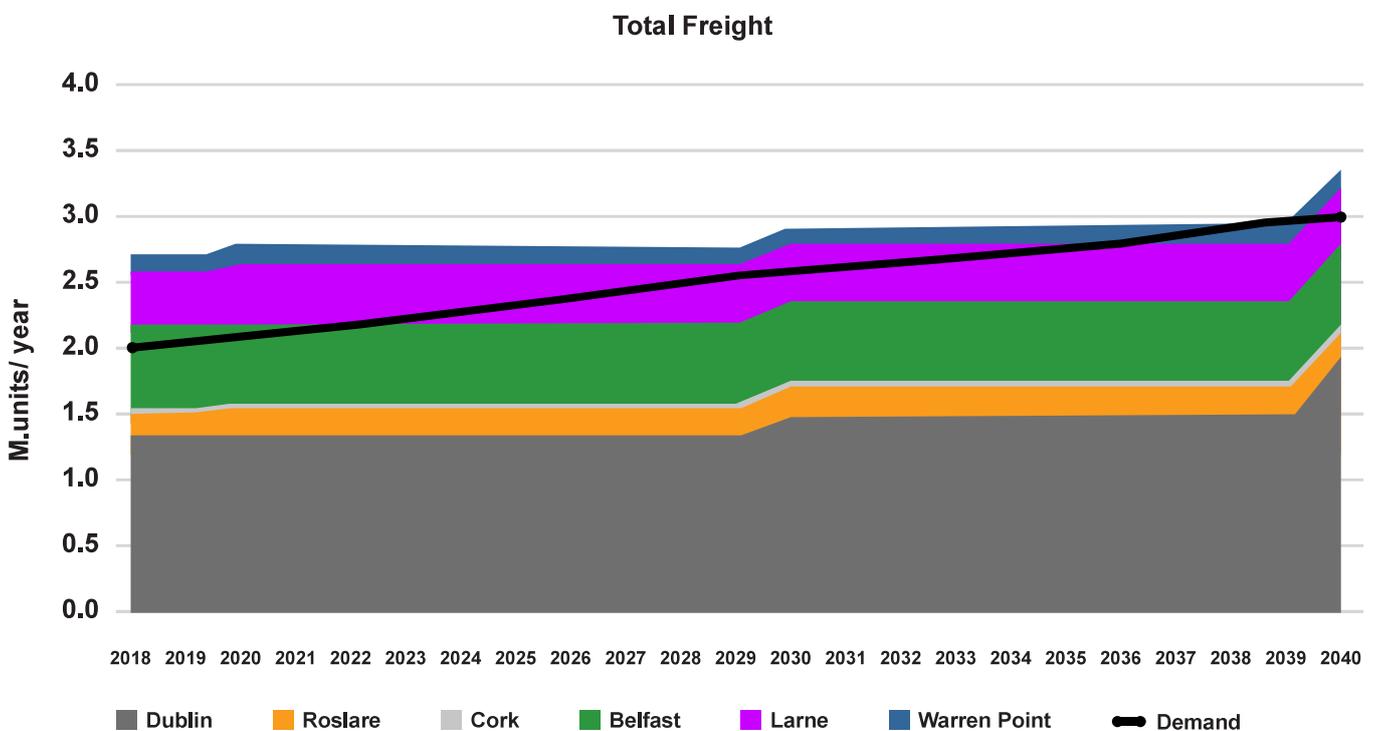


Figure V: Capacity and demand for total RoRo freight on the Island of Ireland until 2040

Executive summary

Combined LoLo capacity

Most of the current capacity on the Island of Ireland for handling LoLo is situated in Dublin, Cork, Waterford and Belfast.

Dublin Port has by far the greatest LoLo throughput and, considering its current market share, this is unlikely to change. Dublin Port will need to increase its capacity around 2027 and is planning for this. The throughput in Dublin Port is three times the throughput of Port of Cork, which is the second largest LoLo port.

A significant increase in LoLo capacity is planned for the next 5-7 years in Port of Cork. This increase is planned in the new Ringaskiddy container terminal, which is expected to require an expansion by 2030.

Overall, the network of Irish Ports has just enough capacity planned to meet demand for LoLo until 2040. Some additional short-term precautions may be required in 2039 as the forecasted demand is very close to the estimated capacity.

Combined Dry & Break Bulk capacity

The capacity for handling Dry & Break Bulk is more evenly spread between all the ports on the Island of Ireland. Belfast Harbour has the largest throughput of Dry & Break Bulk at nearly 8 million tonnes per year. This is more than double the capacity of any of the other ports in Ireland currently handling Dry & Break Bulk.

The ports with the largest capacity for handling Dry & Break Bulk in Ireland are Dublin Port and Shannon Foynes. There is also spare capacity at Port of Waterford which could be used to meet any significant increases in demand over that forecast period reflected in this report.

The capacity versus demand assessment shows that the network of Irish ports has enough capacity planned to meet demand for Dry & Break Bulk up until 2040.

Combined Liquid Bulk capacity

There is a lot of uncertainty in relation to the development of demand for Liquid Bulk in particular fossil fuels. Per-capita demand changes are expected with the drive from the EU to reduce carbon emissions, the Government's 2030 Internal Combustion Engine car-sales ban policy and the cost of renewable energy sources coming down. Any uncertainty with respect to demand suppression will be combined with a growth in volume driven by GDP, the economy and a growing population. At the time of the forecasts there is no definite understanding as to how fast such per-capita efficiencies could appear, their magnitude and how this will compound with overall anticipated GDP and population growth.

For the purpose of demand forecasting and capacity assessment, in this study we have assumed that liquid bulk demand will steadily increase up to 2040 in line with the economic forecasts included in this report. We note, though, that this increase will be offset, in part, by improved fuel efficiency.

Overall, the network of Irish Ports has enough capacity planned to meet demand for Liquid Bulk until 2024 when a reduction in capacity in Dublin Port may cause a capacity constraint until the Foynes Island development can be brought on-line. It is noted that the additional capacity that has recently become available in Port of Cork is not included in the combined capacity.

Risk assessment

A risk assessment was undertaken to identify the risks associated with current and planned port capacity. The following categories of risks were identified:

- **Exceedance of Growth Estimates:** There remains the risk that economic forecasts and the derivative capacity assessment undertaken in 2018 exceed forecast expectations. Growth in both overall port movements and individual

port movements exceeding estimates creates the risk that capacity may be exceeded beyond the assessment undertaken. Although this is considered an apparent and clear risk, an iterative approach to the review and update of capacity assessments, and the continuous investment in Irish port capacity can alleviate this risk, within reasonable limits.

- **Operational and infrastructure deficits:** There is a risk that underinvestment, lack of maintenance or damage could occur to critical port infrastructure which could result in a sudden capacity deficit for the ports.
- **Deficits in connectivity to hinterland:** Congestion or complete blockage of intermodal connectivity can also lead to capacity deficits (motorways, waterways, rail lines and the Dublin Port tunnel, in particular).
- **Funding:** Funding is cited by all ports as the biggest impediment to capacity increases.
- **Planning and programming:** There is a risk that some developments will take longer than expected to obtain planning consent. Some may not be granted planning permission at all.
- **Climate Related Regulations and Impacts:** As governments move to implement regulations and supporting mechanisms for the mitigation of climate impacts, the shipping and ports industry will need to undergo significant changes. This will manifest as direct industry impacts, and changes to product demands.

Conclusions and recommendations

Overall, the analysis undertaken as part of this study shows that:

- There is a strong link between economic variables, in particular GDP (and, by proxy, private consumption) and trade volumes.

The economy appears to be acting as a magnet for goods and the ports ensure that this demand is met.

- The Irish ports included in this study currently have sufficient capacity for RoRo (with the exception of trade vehicles), LoLo, and Dry & Break Bulk, and are planning adequate capacity increases in time to manage future demand for these cargoes for the period up to 2040. Additional expansions for the trade vehicles and liquid bulk cargoes should be planned where necessary to avoid constraint by the late 2020s and 2030s respectively.

Nevertheless, for both these cargoes the demand figures have high levels of uncertainty considering the ongoing transformation of these industries and represent conservative scenarios.

- The lead-in time analysis shows that sufficient new capacity developments are planned and can be delivered on time, although financing and planning consent difficulties may cause some delays and associated capacity constraints.
- Dublin Port will remain the dominant port in Ireland. The Dublin Port Masterplan 2040 sees a further increase in capacity for RoRo, LoLo and Dry & Break Bulk. A full feasibility assessment will be required closer to that time once more is known about certain drivers for the proposed development of a new port on the East coast of the Island.
- There are opportunities to make use of surplus RoRo capacity in Rosslare Europort and Port of Cork and LoLo and Dry & Break Bulk capacity in Waterford. However, these ports will require better hinterland connectivity and a range of investments in port facilities.

-
- The development of demand for Liquid Bulk is an area where there is a lot of uncertainty. Environmental considerations about the use of fossil fuels and decarbonisation targets in Ireland's Climate Action Plan could lead to a reduction in demand for Liquid Bulk, but there is uncertainty about when this reduction may take place and how it will manifest in port specific demand.

The main recommendations are:

- A standardised form of reporting by the Irish ports for capacity indicators in Tier 1 and Tier 2 ports is needed, in conjunction with the Northern Irish ports to ensure uniformity in reporting.
- The predicted capacity constraints only happen if growth continues and there needs to be regular monitoring of the situation across the Island of Ireland. The capacity assessment should be revisited at regular intervals to capture economic variances and future developments.
- The implementation of digital port operating systems and port clearance document control systems should be investigated for those ports not already using these. Ideally, all Irish ports should use compatible systems.
- There is a need to investigate the impact efficiency measures and pricing structures will have on the capacity in Dublin Port.
- There is a need to investigate the development of the Liquid Bulk demand and establish high and low growth scenarios.

