MP2 PROJECT

Appendix B

DESCRIPTION OF PORT OPERATIONS

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MP2 Project

A description of operations in Dublin Port

11th July 2019

Contents

1. Introduction

The MP2 Project is the second of three Strategic Infrastructure Development projects which, between them, will deliver the vision of Dublin Port's Masterplan 2040. This vision sees Dublin Port being developed to its maximum and ultimate capacity by 2040. At that point, cargo throughput will have risen from 30.8m gross tonnes in 2018 to 77.2m in 2040.

This description of operations at Dublin Port has been prepared to facilitate an understanding of the MP2 Project application for permission. The description covers all port operations including those not directly affected by the MP2 Project.

Dublin Port is the largest port on the island of Ireland and is an essential link for the country's international trade and transport requirements.

Dublin Port is owned and operated by Dublin Port Company (DPC).

DPC's main function is to facilitate the movement of goods and people in an efficient and cost effective manner.

The type of goods and the manner in which they are transported fall into five cargo modes:

- ***Roll-on Roll-off (Ro-Ro)***: Freight trailers, containers, vans, passenger cars, coaches, car imports
- ***Lift-on Lift-off (Lo-Lo)***: Containers carrying all types of goods
- ***Bulk Liquid***: Refined petroleum products of different types (including petrol, diesel and aviation fuel) and other liquid commodities such as molasses
- ***Bulk Solid***: Including grains, animal feeds, bulk cement, aggregates, petroleum coke, slag, peat moss and scrap metal
- ***Break bulk and other goods***: Loose products such as timber paper, steel and project cargoes (such as rail carriages, wind turbine components and large components for construction projects)

In addition Dublin Port's throughput includes passengers primarily on multipurpose ferries (i.e. both freight and passengers) in cars, on coaches or as foot passengers but also on cruise ships. As a passenger gateway Dublin Port is larger than Shannon Airport.

2. Ro-Ro (Roll-on Roll-off)

Ro-Ro refers to shipping services and activities where vehicles are driven on and off ferries or other specialised ships (such as car carriers).

In 2018, Dublin Port handled 89% of Ireland's Ro-Ro freight traffic. This traffic consists of freight vehicles, freight trailers, containers, coaches, passenger cars, trade vehicles and specialist trailers.

Dublin Port handles some of the largest Ro-Ro vessels in the world with 16 sailings each day between Dublin and the UK ports of Holyhead, Liverpool and Heysham.

On a typical day (Friday 11th January 2019) eight ferries arrive from Holyhead carrying Ro-Ro trailers (mostly accompanied as explained below) as well as passengers:

Arrival time*	Operator	Ship
05:03	Stena Line	Stena Adventurer
05:16	Irish Ferries	Ulysses
11:05	Irish Ferries	Epsilon
11:30	Stena Line	Stena Superfast X
16:40	Stena Line	Stena Adventurer
16:45	Irish Ferries	Ulysses
22:59	Irish Ferries	Epsilon
23:08	Stena Line	Stena Superfast X

** Arrival times as per DPC's marine operations management system*

These eight ferry arrivals from Holyhead are grouped in four waves each day as shown below.

Wave	Ship	Operator	Arrival*	Departure*
Early morning	**Stena Adventurer**	**Stena Line**	**05:45**	**08:10**
	Ulysses	**Irish Ferries**	**05:55**	**08:05**
Mid-day	**Epsilon**	**Irish Ferries**	**11:20**	**14:30**
	Stena Superfast X	**Stena Line**	**12:10**	**14:50**
Late afternoon	**Stena Adventurer**	**Stena Line**	**17:05**	**20:40**
	Ulysses	**Irish Ferries**	**17:25**	**20:55**
Late night	**Epsilon**	**Irish Ferries**	**23:15**	**02:00**
	Stena Superfast X	**Stena Line**	**23:55**	**02:15**

***** *Arrival and departure times as per lines' schedules*

Another eight ferries arrive from Liverpool / Heysham carrying mostly unaccompanied Ro-Ro trailers. The P&O service also carries a small number of passengers.

Arrival time	Operator	Ship
02:28	Seatruck	Seatruck Pace
04:22	P&O	Norbank
05:19	Seatruck	Seatruck Progress
09:48	Seatruck	Seatruck Panorama
10:15	P&O	European Endeavour
12:00	Seatruck	Clipper Point
16:50	P&O	Norbay
16:55	Seatruck	Seatruck Power

Between the Holyhead and Liverpool ferries, 12,000 lanemetres of Ro-Ro trailers arrive in a one hour period every morning. Half of this volume goes straight out the Dublin Port Tunnel before the morning rush hour.

Ship	Operator	Lanemetres[1]	Arrival[2]
Norbay	**P&O Ferries**	**2,040**	**04:25**
Seatruck Power	**Seatruck**	**2,166**	**05:00**
Stena Adventurer	**Stena Line**	**3,400**	**05:15**
Ulysses	**Irish Ferries**	**4,106**	**05:30**

1 Source: Sea-web Ships

2 Dublin Port arrival time

In addition to Ro-Ro services between Dublin Port and British ports, there are also direct Ro-Ro services between Dublin and Continental Europe (Rotterdam, Zeebrugge and Cherbourg):

- Irish Ferries' *W.B Yeats* (2,800 lanemetres) operates three roundtrips per week to Cherbourg.
- CLdN operates six sailings into Dublin Port from Zeebrugge and Rotterdam each week on large dedicated freight-only ferries. The largest of these has a capacity of 8,000 lanemetres (*Celine*)


IRISH FERRIES


NORFOLK LINE


COBELFR
COBELFR

Ro-Ro freight is transported either "*accompanied*" or "*unaccompanied*".

- "*Accompanied*" refers to trailer units to which the cab is attached at all times and the driver accompanies the vehicle on the Ro-Ro ferry.
- "*Unaccompanied*" refers to freight trailers that are delivered and collected from the compound adjacent to the vessel. These trailers are driven on and off ships by dock workers.

The main difference in the two operations is the amount of land needed to service the units.

In the case of accompanied freight, the units drive off the vessel and leave the port immediately.

DPC has targets for land utilisation of 40,000 units per hectare per annum for accompanied Ro-Ro and 20,000 units per hectare per annum for unaccompanied Ro-Ro.

In 2018, more than 1.0m Ro-Ro freight units[1], over 0.5m passenger vehicles and 1.8m passengers were handled on Ro-Ro ferries in Dublin Port.

[1] Freight units are typically 13.6 metre long trailers of varying types including refrigerated units, curtain-sided trailers, flat trailers and car transporters. There are also smaller freight units including non-articulated trucks and vans.

3. Lo-Lo (Lift-on Lift-off)

Container shipping can be divided into two categories.

There are the very large ocean going container vessels, carrying up to 21,000 TEU (twenty-foot equivalent units[2]), that operate over long distances between the larger ports in the world, and there are smaller shortsea vessels that connect those larger ports with smaller ports such as Dublin.

The smaller shortsea container ships that call to Dublin link Ireland with ports mainly in northern Europe (including Rotterdam, Antwerp and Le Havre) but also ports in the UK, and the Mediterranean. A typical large container ship in Dublin Port would have a carrying capacity of about 1,000 TEU.

Lo-Lo container ships are the workhorses for moving goods between Ireland and Continental European ports such as Rotterdam, Antwerp and Le Havre. Although containers move to and from Continental Europe on Ro-Ro ferries (such as CLdN's *Celine*), most (about 80%) move on container ships such as Eucon's *Elbtrader*. This is typical of the container ships operating in and out of Dublin Port and has a capacity of 924 TEU or about 450 units. To carry the same amount of freight, a Ro-Ro freight ferry would need about 6,300 lanemetres of capacity.

The shortsea container ships carry containers originating from or destined for locations in Europe. They also carry containers trans-shipped from the large ocean going container ships

[2] Containers vary in length and are mostly 20', 40' or 45' long. A small proportion are 30' long. The storage capacity of container ships and of container terminals is specified in terms of how many 20' containers they can store where one forty foot container is equivalent to 2.0 TEU

which operate services to the Far East, the Americas and beyond. In this latter role, shortsea container ships are referred to as *feeder ships*.

The cargo handling equipment for containers is divided into two main groups: *primary handling equipment* and *secondary handling equipment*.

Primary handling equipment refers to cranes of different types used to load and unload containers on and off the ship. There are two main types of crane in use in Dublin Port, rail mounted gantry cranes and dock mobile cranes.

Secondary handling equipment refers to the equipment (usually gantry cranes of one type or another) used to store containers in back areas in large stacks.

In Dublin, there are rubber-tyred gantries (RTG's) and rail mounted gantries. The largest RTG's can store containers in stacks up to six containers high and seven wide. These stacks occupy large areas of port land and DPC has a utilisation target of 40,000 TEU per hectare per annum for the port's container terminals.

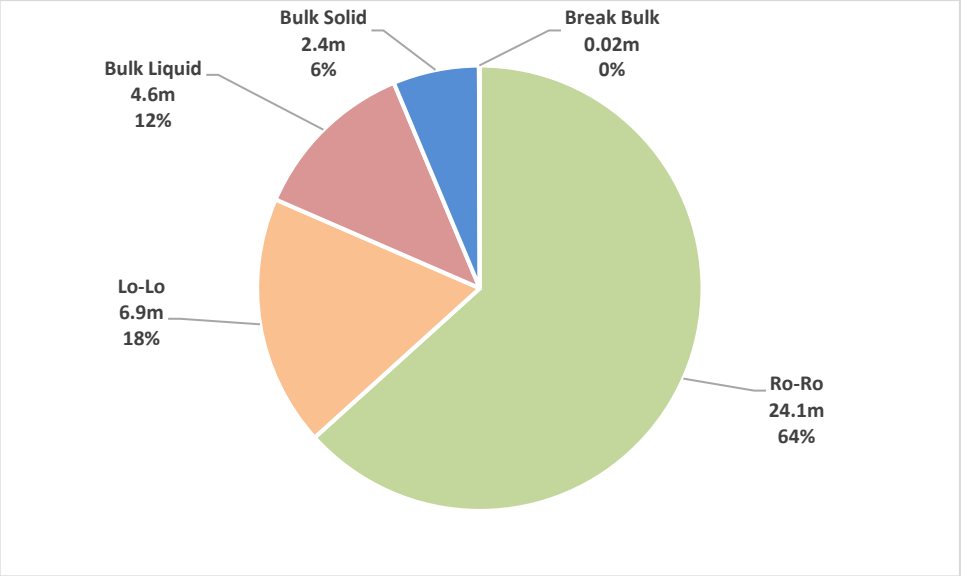
Containers are moved between the stacks and the quay side cranes by special heavy duty truck and trailer combinations or by reach stackers.

In 2018, Dublin handled 407,000 Lo-Lo units (equivalent to 726,000 TEU).

4. Unitised cargo

Ro-Ro and Lo-Lo, combined, are jointly referred to as *unitised* as the freight is carried in "units" i.e. containers or road trailers.

Unitised cargo makes up 82% of the freight through Dublin Port.



In 2018, there were in excess of 1.4m unitised loads moved through Dublin Port.

Within unitised freight, there is now a large degree of intermodal mobility of containers between Lo-Lo and Ro-Ro and, in 2018, 80% of all containers that moved through Dublin Port did so on Ro-Ro ships.

5. Landbridge

The use of the UK landbridge for the movement of unitised freight between Ireland and Continental Europe is an important consideration for DPC because of Brexit.

The table below shows the volumes of unitised freight (Ro-Ro and Lo-Lo) through Irish ports in 2017. In the case of Lo-Lo, the volumes are stated in terms of units rather than TEU in order to provide a common base which allows volumes in both modes to be aggregated[3].

Units (2017)	**Ro-Ro** ***(IMDO)***	**Lo-Lo** ***(CSO)***	**Total**	**%**
Dublin	992,060	392,494	1,384,554	83.6%
Rosslare	128,350	-	128,350	7.7%
Waterford	-	20,493	20,493	1.2%
Cork	556	122,479	123,035	7.4%
Total	**1,120,966**	**535,466**	**1,656,432**	**100.0%**

DPC's analysis suggests that these volumes are distributed over four main flows as shown below.

	Units	**%**
UK (excl. landbridge)	797,737	48.2%
CE[4] via landbridge	168,036	10.1%
CE direct	433,173	26.2%
Deepsea feeder[5]	257,487	15.5%
Total units (2017)	**1,656,432**	**100.0%**

Whereas the landbridge is undoubtedly important for companies requiring fast transit times of, for example, time sensitive products, landbridge traffic only represents about 10% of the total volumes moving through Irish ports.

Moreover, the number of units moving between Irish ports and Continental Europe on direct services is already more than two times that moving via the landbridge as shown below both for all ports and in Dublin Port alone.

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[3] The ratio between TEU and units for Lo-Lo traffic nationally is 1.8.

[4] Continental Europe

[5] Deepsea feeder traffic from ports such as Rotterdam, Antwerp and Le Havre clears customs in Dublin. In Customs parlance, it is referred to as "T1" cargo. Intra-EU traffic is "T2" traffic. After BREXIT, the volume of Dublin Port's T1 traffic increases from approximately 200,000 units per annum to about 1,000,000 units overnight.

	All ports		*Dublin Port*	
	Units	**%**	**Units**	**%**
CE via landbridge	168,036	27.9%	137,232	29.7%
CE direct	433,173	72.1%	325,215	70.3%
Total CE	**601,209**	**100.0%**	**462,447**	**100.0%**

Dublin Port's analysis above is consistent with analysis carried out by the IMDO[6].

6. Bulk Liquid

Dublin Port handles many different bulk liquid products including petrol, diesel, kerosene and bitumen but also non-petroleum liquids such as molasses.

The liquid petroleum products are discharged from tanker ships at four dedicated berths in the north area of the Port and then pumped through a pipeline system, shared by different operators, to their storage tanks within the Port. On average, there are four oil tanker arrivals every three days. Storage capacity for in excess of 300,000 tonnes of oil products is available within the Port.

Oil products are delivered by road from the Port to the many distribution centres and filling stations outside the Port.

A good example of the short supply chain for petroleum products is the supply of aviation fuel to Dublin Airport. The relatively small storage capacity at the airport means the ongoing operations and supply of aircraft fuel to the airport is heavily dependent on continuing efficient operations at Dublin Port.

Molasses is handled in the south port area and the product is discharged through a dedicated pipeline to storage tanks at the customer's site for onward distribution by road.

In 2018, Dublin Port handled 4.6m tonnes of bulk liquids, including nearly two thirds of the country's petroleum requirements in the year.

[6] https://tinyurl.com/IMDO-Landbridge-Study-Report


ANNELEEN KNUTSEN
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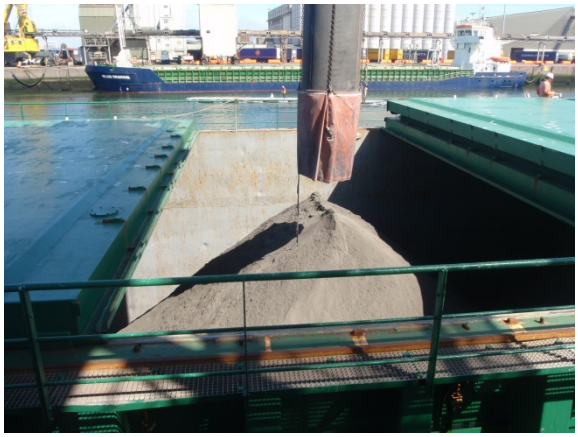
7. Bulk Solid

Bulk solid refers to the materials that are handled in bulk (such as grain, animal feeds, fertilizer, peat moss, cement, petroleum coke, furnace slag, scrap metals, contaminated soil and incinerator waste). Such commodities are handled on both the north and south sides of the Port. As the name implies, these materials are in loose form and not contained in bags, containers or other forms of packaging.

The materials are mostly loaded and discharged by grabs operated by dock mobile cranes. However, some is loaded by conveyor (such as the 0.3m tonnes of lead and zinc ore concentrates from Tara Mines each year) and some is pumped (such as bulk cement) from road tankers.

The total volume of bulk solid goods moved through the port in 2018 was 2.4m tonnes.



8. Cruise ships

Cruise ships are an important part of Dublin Port's business and Dublin is the largest cruise destination in the country with 150 cruise ships in 2018 bringing almost 200,000 visitors to the city.

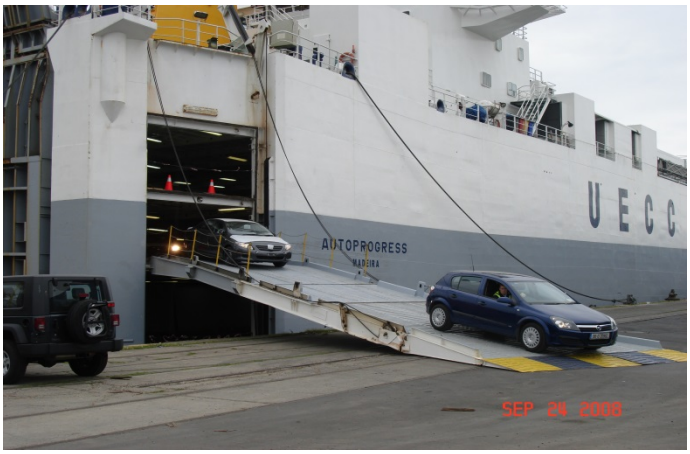
9. New vehicle imports

Dublin Port handles large numbers of imported cars, vans and trucks.

These vehicles are transported both on specifically designed large Ro-Ro ships and (increasingly) on Ro-Ro freight ferries alongside other freight (such as trailers and containers).

The importation of vehicles requires large areas of open, surfaced ground for parking the vehicles until they are collected by truck for onward delivery to the customer.

In 2018, 103,000 trade vehicles were imported through Dublin.



10. Break bulk and other goods

Break bulk comprises loose products such as timber, steel and paper. Such commodities have all but disappeared in Dublin Port and are now handled in smaller ports. However, loose shipments of, for example, project cargoes continue to come through Dublin Port.

For example, the structural components for the Aviva Stadium were brought in through the Port as was the Samuel Beckett Bridge.

Other major cargoes in recent years have included mainline and suburban rail carriages. Large items of plant and machinery for power stations, large factories or major construction projects have also passed through the Port.

In recent years, the Port was particularly busy with the importation of wind turbines for wind farms all around the country. Such cargoes require large land areas for storage and because of pressure on space, wind turbine shipments are no longer accommodated.

11. Getting goods to and from Dublin Port

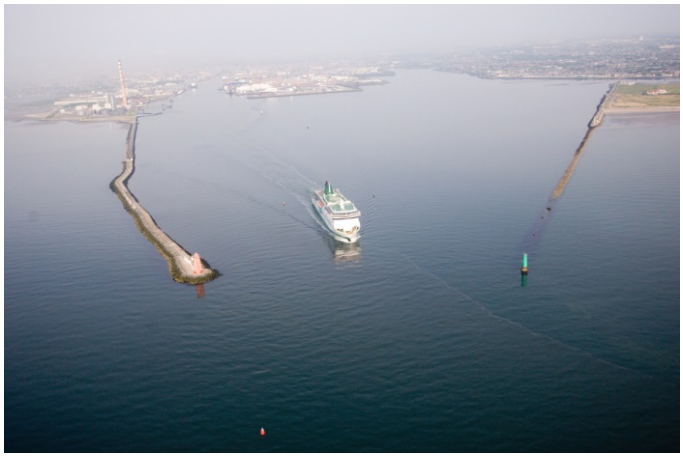
By sea

The approach channel for ships into Dublin Port is approximately 10km long and is split into two halves.

The first 5km of a ship's passage into the Port from the Dublin Bay Buoy to the Poolbeg Lighthouse is along a dredged channel through the sand bar in front of the Port's entrance. The second 5km is the fairway stretching from Poolbeg Lighthouse to the Tom Clarke Bridge.

This is the busiest shipping channel on the island of Ireland and a busy channel by international standards with between 40 and 50 ship movements each day. Many of these are grouped around the high water times of the tidal cycle. Others (Ro-Ro ferries on scheduled services) arrive and depart at the same fixed times each day.

The safe management of this shipping channel and especially the narrow section between the Poolbeg Lighthouse and the North Bull Lighthouse is a core responsibility for DPC. This responsibility and the wider obligation to control the movement of shipping in Dublin Bay requires the 24 x 7 availability of the Port's Vessel Traffic Services (VTS) , pilot service and tug service.



DPC is currently deepening the Port's channel in six stages (the first two of which have been completed) from -7.8m at chart datum[7] (CD) to -10.0m CD.

By rail

Although most freight moves in and out of the Port on the landside by road, there is an active and increasingly used rail connection with ten train movements in and out of the Port each day.

There is a direct rail link to Tara Mines in Navan which brings in the order of 0.3m tonnes per annum of export cargo each year.

There is also a daily container train service to Ballina which transports 25,000 TEU annually.

[7] DPC reckons water depths in Dublin Port by reference to Chart Datum. Chart Datum in Dublin is 2.51 metres below Ordnance Datum Malin.

By road

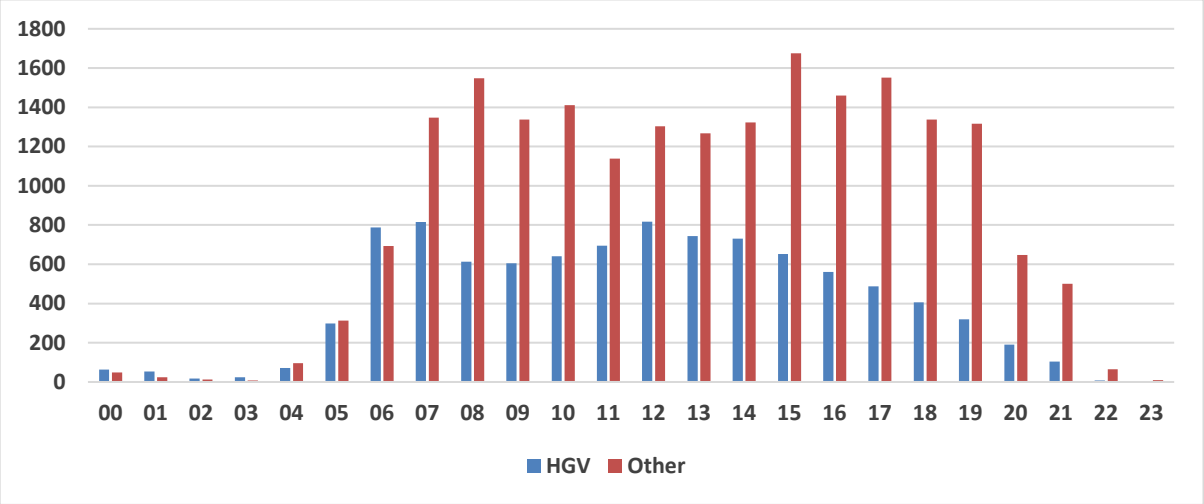
Dublin Port benefits from its direct connection to the national motorway network through the Dublin Port Tunnel.

The average daily traffic volumes through the Dublin Port Tunnel on each day of the week are shown below for March 2019.

	HGV	Other	Totals	% HGV
Monday	1,809	11,528	13,337	14%
Tuesday	8,103	15,865	23,968	34%
Wednesday	10,100	18,403	28,503	35%
Thursday	9,741	18,152	27,893	35%
Friday	9,712	19,426	29,138	33%
Saturday	9,676	20,369	30,044	32%
Sunday	3,657	14,097	17,755	21%
Total	**226,328**	**517,351**	**743,679**	**30%**
Average	***7,301***	***16,689***	***23,990***	***30%***

Of the 7,301 HGVs that go through the Dublin Port Tunnel on a typical day, an average of 6,260 (or 86%) is port-related.

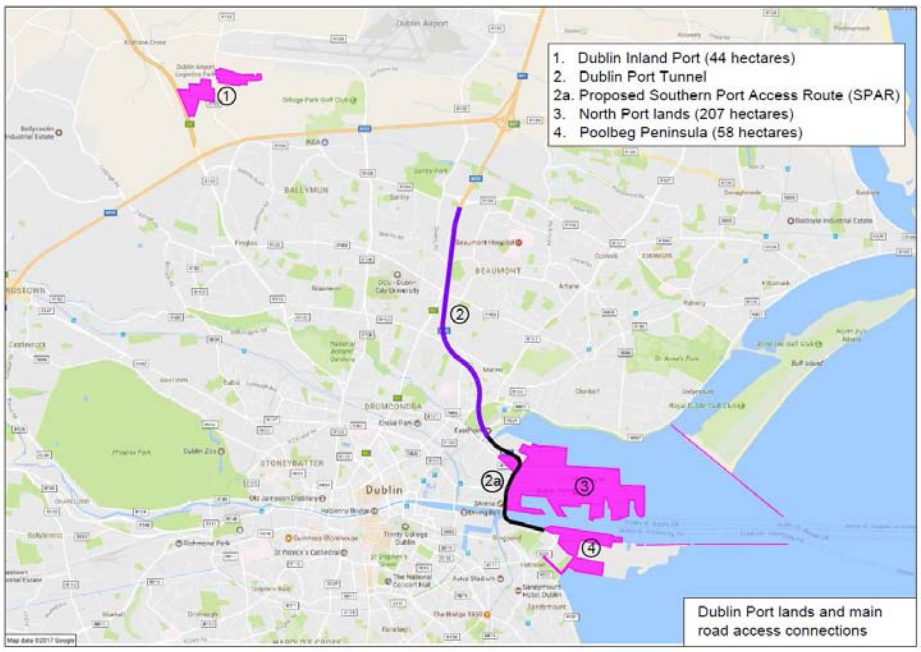
Across the hours of the day, the chart below shows the number of HGVs and of other traffic on a typical weekday (Friday 28th March 2019). On this day, there were 9,708 HGVs from a total traffic volume of 30,141 vehicles.



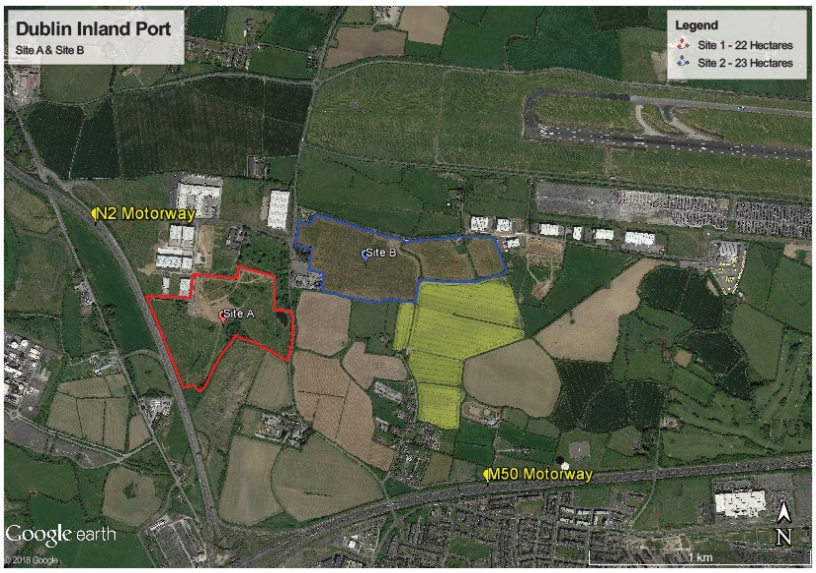
Within the Port's 260 hectare estate, DPC is responsible for the building and maintenance of a large road network which links the Port's many cargo handling facilities to the Dublin Port Tunnel. This road network is currently being upgraded to provide capacity to handle the Port's ultimate volume of 77.2m gross tonnes by 2040.

12. Dublin Inland Port

In addition to the port estate of 260 hectares, DPC is developing Dublin Inland Port. This is a 44 hectare estate located 14km from Dublin Port as shown below.



Dublin Inland Port comprises two separate but adjacent Sites, each 22 hectares in extent.



Development of Site 1 has commenced and the overall development envisaged comprises empty storage depots, haulier facilities and warehousing facilities earmarked for existing operators in Dublin Port who will be reallocated from Dublin Port to Dublin Inland Port as DPC implements the Franchise Policy, 2014.

DPC envisages developing **Site B** of Dublin Inland Port to provide capacity to support operation of the Port's three container terminals and also capacity to manage traffic flows to Dublin Port through the Dublin Port Tunnel as follows:

- Remote container terminal check-in area for the DFT, DSG and MTL container terminals from where hauliers would be called forward into Dublin Port in a controlled manner:
  2.0 hectares
- Laden container tertiary storage area to give up to 400,000 TEU per annum throughput capacity. This is 25% of the 1.6m TEU throughput projected in Masterplan 2040:
  16.0 hectares
- Buffer parking area doubling as a queuing area for the laden storage area:
  4.0 hectares