



Dublin Port Masterplan 2040

Reviewed 2018

Strategic Transportation Study

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Dublin Port Masterplan 2040, Review 2018

Strategic Transportation Study

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GLOSSARY

AADT	Average Annual Daily Traffic
AAGR	Average Annual Growth Rate
ABR	Alexandra Basin Redevelopment
DART	Dublin Area Rapid Transit
DCC	Dublin City Council
DPC	Dublin Port Company
LGV	Light Goods Vehicles
NTA	National Transport Authority
OGV1	Other Goods Vehicles Type 1
OGV2	Other Goods Vehicles Type 2
PCU	Passenger Car Units
PSV	Passenger Service Vehicle
Ro-Ro	Roll On, Roll Off Ferry Services
SDZ	Strategic Development Zone
SEA	Strategic Environmental Assessment
SPAR	Southern Port Access Route
TII	Transport Infrastructure Ireland

EXECUTIVE SUMMARY

Dublin Port Company published a Masterplan in 2012 covering the period 2012 to 2040. The first formal review of the Masterplan was finalised in 2018.

RPS were commissioned to undertake a Strategic Environmental Assessment based on the Masterplan Review, and this Strategic Transportation Study to inform the Strategic Environmental Assessment.

The core objective of the Masterplan Review is to identify how the Port can handle 77 million gross tonnes by 2040 while achieving a reintegration of Dublin Port with Dublin City. The resulting increase in growth, proposed modifications to the road network and the suite of sustainable transport measures included the Masterplan Review have been assessed within this report.

77 million tonnes is based on an average annual growth rate of 3.3% per annum over the 30 years from 2010 to 2040, rather than the 2.5% originally assumed in 2012. The increase in the forecasted growth in cargo volumes is a significant change, and this has been a central element of this Study.

To assist with interpretation of the Study, several schemes and transportation infrastructure improvements, both within the Port and within its environs, which are of particular relevance to this Study have been highlighted.

The National Transport Authority has included proposals in its Transport Strategy for the Greater Dublin Area 2016-2035 to improve connectivity between Dublin Port Tunnel and the South Port area. The Masterplan Review introduces the concept of this link, referred to as the Southern Port Access Road (SPAR). An indicative layout, designed to keep port traffic within the Port Estate to reduce impacts on the local public road network, has been included in this report for modelling purposes.

SPAR will be a private road for Port-related vehicles, however access will be allowed for other industrial traffic, notably for the Waste-to-Energy plant, to take heavy traffic on the Poolbeg Peninsula away from existing residential areas and from new developments in the Poolbeg West SDZ Planning Scheme. Public transport services will also be permitted to use the SPAR to facilitate enhanced services to the Poolbeg Peninsula, providing a congestion free route and facilitating the delivery of an important component of the transport strategy in the Poolbeg West SDZ Planning Scheme.

The SPAR is one the most significant transportation proposals included in the Masterplan Review and has been the focus of detailed assessment in the transport modelling section of this report.

RPS met with and liaised with the National Transport Authority on an-going basis between October 2018 and March 2018 in relation to the run of their strategic multi-modal model for the purposes of this Study.

The assessment finds that the Dublin Port Tunnel has adequate capacity to accommodate the increased 3.3% growth per annum by 2040 based on the capacity of the tunnel coded into the National Transport Authority Regional Transport Model. It also finds that the Toll Plaza is not a limiting factor to the capacity of Tunnel. In any case, TII intend to replace the tolling related equipment and software at the plaza within the next 18 months and are considering upgrading the toll collection system to be free-flow in future years, likely to happen before the 2040 horizon year for the Masterplan.

The Study finds that without the SPAR traffic levels and journey travel times on East Wall Road will increase significantly.

Traffic modelling carried out for the Study gives measurable indicators relating to traffic levels and journey travel times which demonstrate that the SPAR provides mitigation, to better than no-net-determent, for the increased traffic flows generated by the additional growth at the Port. i.e. the road network performs better for the 3.3% growth per annum with the SPAR than for the 2.5% growth per annum without the SPAR already engrained in the 2012 Masterplan.

The results shows that the SPAR is predicted to carry around 12,900 passenger carrier units each working day in the design year of 2040 at the section that crosses the Liffey, a level for which a single-carriageway road is appropriate.

Due to the introduction of the SPAR:

- Tom Clarke Bridge is relieved of approximately one-third of its traffic throughout the day;
- A 14% reduction in the traffic flows occurs on East Wall Road compared to the no-SPAR base scenario;
- Typical journey travel times for through traffic between Sean Moore Road and the Dublin Port Tunnel reduce by 25% northbound and 4% southbound compared to the no-SPAR base scenario;
- The local road network will experience a time saving equivalent to 1300 cars saving an hour of time each during the AM peak hour and 260 cars saving an hour of time each during the PM peak hour;
- Allowing traffic from south of the Liffey to use the SPAR to access the Northern Lands relieves the Promenade Road in the eastbound direction;
- There is an increase in traffic entering the Port from the Dublin Port Tunnel with a destination in the Southern Lands, removing commercial traffic from the local, non-strategic road network.

The results show that local network is modelled as generally functioning within capacity at the end of the Masterplan during the morning and evening peak hours with the additional Port growth and with the SPAR. The only exception is the Samuel Beckett Bridge junction on the North Quays, however, the small amount of traffic relief to the Samuel Beckett Bridge provided by the SPAR serves to mitigate the capacity of the junction against the no-SPAR base scenario.

A summary of the transport related issues identified by the Study are as follows:

- The traffic signals on Promenade Road (on entry to the Port from the Tunnel) and the upgraded Promenade Road Roundabout will be operating at or slightly over capacity in the AM peak hour and should be the subject of future detailed traffic impact assessment as the Masterplan is implemented;
- Consideration could be given to the continuation of the principle of Bond Road giving access to non-Port users;
- Traffic management measures will need to be in place to prevent the SPAR from becoming a rat-run, particularly at the new Upper Sheriff Street Access;

- Traffic management will continue to be required along the internal section of Alexandra Road where the SPAR interacts with the railway;
- The continued presence of the East Link Toll Bridge has a role to play in the traffic management. It's generally a better scenario for the Port for the East Link Toll to remain in place;

Dublin Port Company has acquired 44 hectares of lands located 14km from the Port to provide facilities for non-core but Port related activities relocated from the main Port Estate. Referred to as the Dublin Inland Port, it may require localised access enhancements to connect onto the excellent connectivity provided by the surrounding strategic road network. It may reduce traffic within the Dublin Port Tunnel due to the reduction of vehicles doubling-back through the Tunnel, and is subject to a transport study commissioned by Finglas County Council to assess the cumulative impact of similar schemes in the same area.

The commencement of the project to redevelop the Port's internal road, cycle and pedestrian network is considered as the foundation to make possible a suite of proposed walking, cycling and public transport enhancement measures included in the Masterplan Review, with an emphasis on safe access throughout the Port Estate for cyclists and pedestrians and efficient links with local public transport networks.

The Study finds that there is a significant level of existing public transport provision in the area to the west of the Port.

The proposed sustainable transport measures within the Masterplan Review, in conjunction with sustainable transport schemes being progressed by others, will provide a much enhanced improvement over the existing infrastructure and fill the gaps in the current under provision within the Port Lands, Poolbeg Peninsula and crossing the Liffey. It will contribute towards achieving the Port's aspirations relating to social integration, its role as a gateway for visitors to Ireland and the integration of sustainable transport modes.

The Masterplan Review commits to the continued promotion for use of the rail and the careful retention of existing infrastructure to ensure that the Port is sufficiently connected to the rail freight and a modal shift towards its use is encouraged.

The Masterplan Review commits to a new comprehensive Dublin Port Travel Plan to deliver, control and monitor the sustainable transport enabling measures at the Port with a focus on encouraging a modal split.

1. INTRODUCTION

Dublin Port Company (DPC) published a Masterplan in 2012 covering the period 2012 to 2040.

The Masterplan provides an overall vision as to how Dublin Port could be developed over this period, and is central to the Port's programme of investment in additional capacity and improved facilities.

It was recognised at the time that the Masterplan needed to be kept under review to ensure that it remains relevant. The first formal review of the Masterplan was undertaken by DPC in 2017 and finalised in 2018.

Initially a *Masterplan Review Consultation Paper* was released in January 2017. A document entitled *Dublin Port Masterplan 2040, Reviewed 2018, Draft* was subsequently issued in April 2018 for further consultation. The finalised document, entitled *Dublin Port Masterplan 2040, Reviewed 2018*, is dated June 2018 and is referred to as the Masterplan Review for ease of reference in this report.

RPS were commissioned to undertake a Strategic Environmental Assessment (SEA) of the Masterplan Review.

RPS were also commissioned to undertake this report, the Strategic Transportation Study, which documents the traffic forecasting, modelling and review of sustainable transport measures that was undertaken in order to inform the SEA.

This report should be read in conjunction with the Masterplan Review and the SEA report.

The core objective of the Dublin Port Masterplan Review is to identify how the Port can handle 77 million gross tonnes by 2040 while achieving a reintegration of Dublin Port with Dublin City. 77 million tonnes is based on an Average Annual Growth Rate (AAGR) of 3.3% per annum over the 30 years from 2010 to 2040, rather than the 2.5% originally assumed in 2012. This increase in the forecasted growth in cargo volumes is a significant change, and this has been a central element of this Study.

Within the Masterplan Review it is recognised that it is important to focus on the transport and travel issues concerning the operation of the Port in order to achieve the anticipated growth levels – in particular how Dublin Port connects with inland transport networks outside the Port Estate. It also highlighted the importance of examining travel within the Port Estate to ensure that more sustainable modes of transport are facilitated and encouraged over the Masterplan period. Hence, a suite of transport related measures are included the Masterplan Review which have been assessed within this report.

To assist with understanding the report, the first section introduces schemes, both within the Port and within its environs, which are of particular relevance to the Study.

Secondly the suite of measures relating to sustainable transport - walking, cycling, public transport and rail freight - are highlighted and assessed.

The strategic transport modelling section follows, which assesses the impact on the strategic and local road network of the proposed increase in growth at the Port and the proposed transport related infrastructure enhancements included in the Masterplan Review.

The Dublin Inland Port is then considered, along with the proposed new Dublin Port Travel Plan.

2. SUMMARY OF SCHEMES THAT ARE RELEVANT TO THE STUDY

There are several schemes and transportation infrastructure improvements, both within the Port and within its environs, which are of particular relevance to this Study. They have been discussed below to assist with understating of the context of the Study. They vary in size and scale. Some have already obtained planning permission, and others are proposals at different stages of progression. These are listed and discussed below:

- ABR Project and committed closure of the Port accesses along the East Wall Road;
- Dublin City Council (DCC) Scheme along East Wall Road;
- Poolbeg West SDZ;
- Extension of the Luas Red Line across the Liffey;
- Proposed Southern Port Access Route (SPAR).

2.1 ABR PROJECT AND COMMITTED CLOSURE OF THE PORT ACCESSSES ALONG THE EAST WALL ROAD

As part of the planning application for the Alexandra Basin Redevelopment Project (ABR Project, PA0034) the Port has committed to close the Terminal 3 access with East Wall Road completely, and will close the Alexandra Road access to all operational traffic. Thereafter, the Alexandra Road access will only accommodate light vehicles to the car park for the DPC offices and vehicles associated with cruise vessels.

Note that the rail freight services will continue to use the Alexandra Road access.

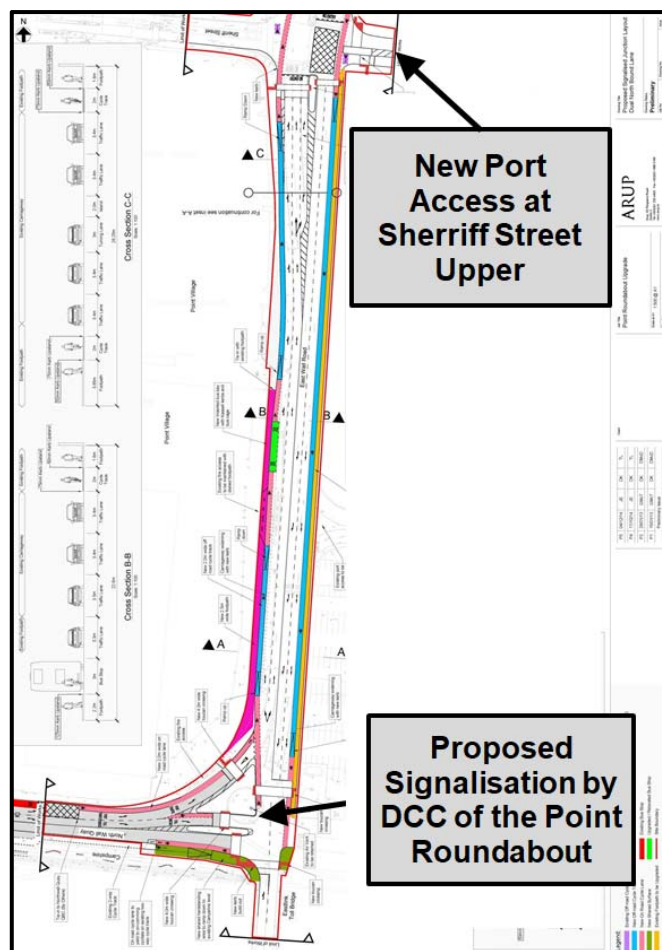
Currently, vehicular access is used intermittently to the Port directly from the roundabout close to the 3 Arena (the East Wall Road, North Wall Quay, Tom Clarke Bridge Roundabout, referred to as the Point Roundabout for convenience in this report). The Port access at the Point Roundabout will also be permanently closed to vehicles as part of the ABR scheme.

Note that a key aspect of the ABR Project was addressing DPC's vision of integrating the Port with the city by relocating the cruise liners to North Wall Quay Extension and hence closer to the city centre. This will also facilitate passengers from cruise ships accessing the city directly and ensure an increased usage of the city's public transport infrastructure.

2.2 DUBLIN CITY COUNCIL (DCC) SCHEME ALONG EAST WALL ROAD

DCC have a proposed scheme to provide widening along East Wall Road and replace the Point Roundabout with a signalised junction. The scheme is illustrated in Figure 2.1 below.

Figure 2.1 – DCC Scheme to Signalise the Point Roundabout, Widen East Wall Road and Provide a New Port Access Opposite Upper Sheriff Street



The closure of the Port's accesses along East Wall Road facilitates the delivery of the DCC scheme by removing the requirement for vehicles to u-turn at the roundabout to travel towards the Dublin Port Tunnel and hence remove the roundabout. (U-turning is not permitted at signalised junctions.).

DCC will therefore be able to deliver the scheme once the Port accesses along East Wall Road are closed.

The signalisation of the Point Roundabout will provide controlled walking and cycling crossing facilities across the East Wall Road, increasing the safety of cruise passengers accessing the Luas and the Campshires, and allowing the public to access the proposed Interpretation Zone on North Wall Quay Extension committed under the ABR Project.

Importantly for this Study, the DCC scheme includes a new signalised access to the Port at Upper Sheriff Street. This is indicated in Figure 2.1 and will be discussed later within this report.

2.3 CONSENTED ROAD UPGRADE ON THE NORTHERN LANDS

DPC has invested significantly in improving the road network within the Port to facilitate the efficient movement of goods to and from the various terminals and facilities in the Port.

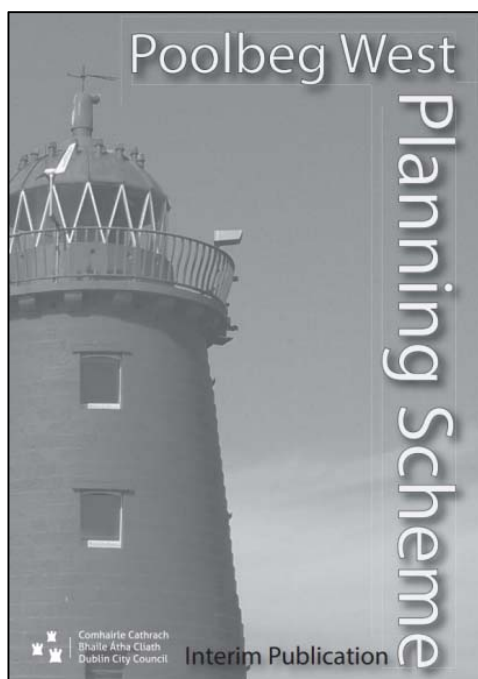
These improvements have been delivered to ensure that the investment in the Dublin Port Tunnel and the expansion of the capacity of the M50 are adequately utilised by freight traffic to and from the Port. In addition to reducing congestion within the Port and reducing the impact of HGV traffic on the City Centre, the strategic investment in both the Dublin Port Tunnel and the upgrading of the M50 have assisted in reducing the times involved in moving goods to and from the Port.

In the progression of this objective DPC have secured planning permission (3084/16) for a major upgrade of the internal road, cycle and pedestrian network within the Northern Lands, which is currently under construction.

This includes:

- A new Promenade Road Extension to connect directly to the Unified Ferry Terminal to be located at the eastern side of the Northern Lands;
- A four kilometre long Greenway on the northern fringe of Dublin Port overlooking the Tolka Estuary;
- Gantry signs to assist with traffic management on the internal road network; and
- A landmark grade separated bridge at Promenade Road.

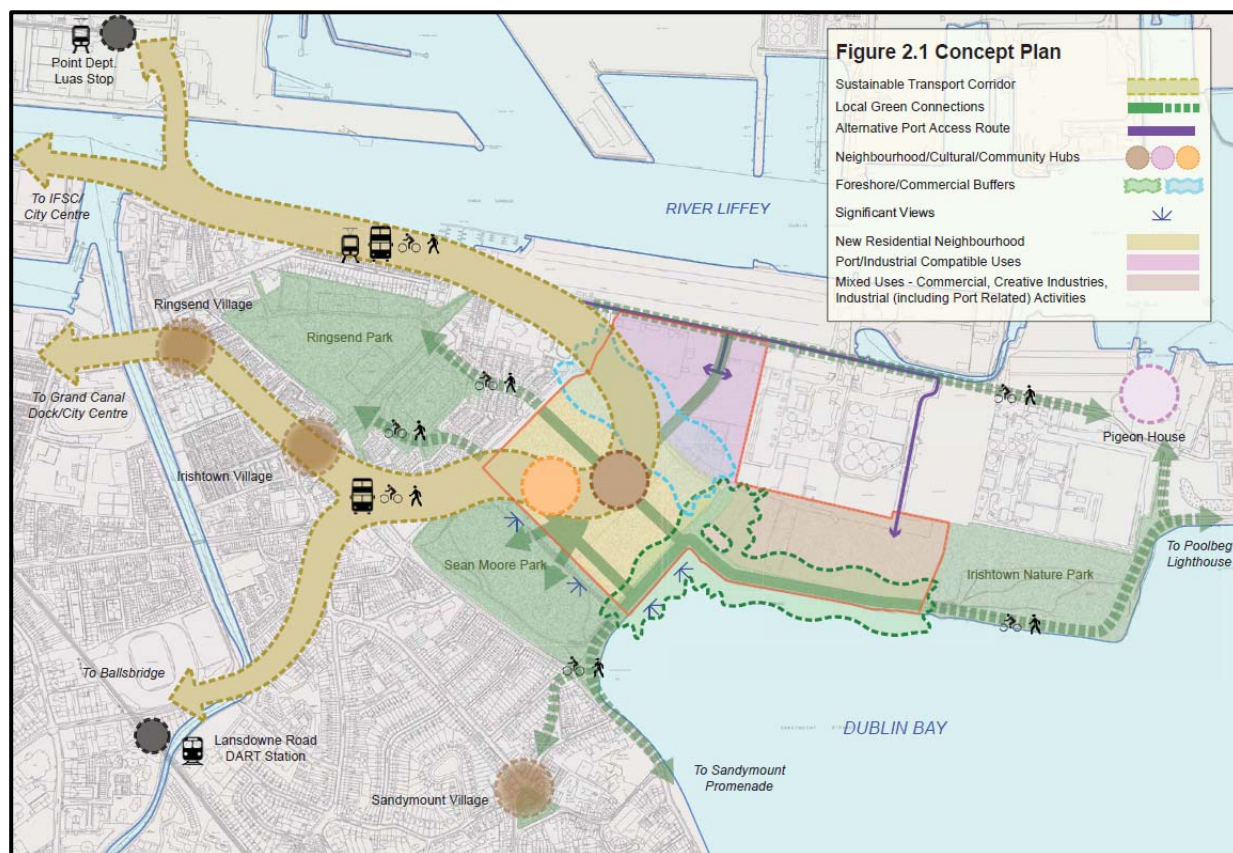
2.4 POOLBEG WEST SDZ



The Poolbeg West SDZ Strategic Development (SI 279 of 2016) and its related Planning Scheme is a proposed mixed use development located on the Poolbeg Peninsula. It includes residential, industrial and commercial uses, and incorporates some sections of Port lands.

It has become evident that the Poolbeg West SDZ will be a sustainable transport based development, and that a car-based residential scheme will not work in that location. Instead, walking, cycling and public transport provision will be progressed to mitigate the impact of the scheme on the local road network and ensure sustainable modes of transport are a viable and real alternative to the private car. The site location and the transport connectivity is illustrated in Figure 2.2 below, extracted from the Interim Publication of the Poolbeg West SDZ Planning Scheme.

Figure 2.2 – Poolbeg West SDZ Concept Plan for Transport Connectivity Extracted from the Interim Publication of the Poolbeg West Planning Scheme



Notably is the provision of a new bridge across the River Dodder to provide cycle and walking connectivity, and public transport services to serve the site in an east-west direction, possibly a rubber wheeled rapid transit service.

In November 2016 DPC issued a document on the Poolbeg Peninsula to provide a review of the possible transport and traffic configurations and public realm enhancements relating to prospective Port operations on the Peninsula, which was evolved and amalgamated into the Masterplan Review.

In doing so DPC have aspired to both integrate and minimise conflict where possible with the vehicular and sustainable transport requirements of the SDZ, providing benefits and synergies to both entities.

Therefore cognizance has been taken on the transport related proposals of the Poolbeg West SDZ Scheme within the progression of the transport related aspects of the Masterplan Review and within this Study.

2.5 EXTENSION OF THE LUAS RED LINE ACROSS THE LIFFEY

Transport Strategy for the Greater Dublin Area for 2016-2035, by the National Transport Authority (NTA), makes reference to an extension of the Luas Red Line to serve the Poolbeg Lands. Para 5.3.8 of the document states:

To serve the future development area of Poolbeg, in addition to Ringsend and Irishtown, it is intended to extend the Luas Red Line south of the River Liffey at, or close to, its eastern end. Potentially, this could be achieved by crossing the Liffey on a new bridge in the vicinity of existing East Link Bridge. Luas services would be extended past the Point, continuing onto Poolbeg development area. This extended link will provide a fast and convenient connection from this area into the City Centre and westwards.

As can be seen in Figure 2.2 the concept of the Luas extension over the Liffey has been incorporated into the Poolbeg West SDZ concept plan.

2.6 PROPOSED SOUTHERN PORT ACCESS ROUTE (SPAR)

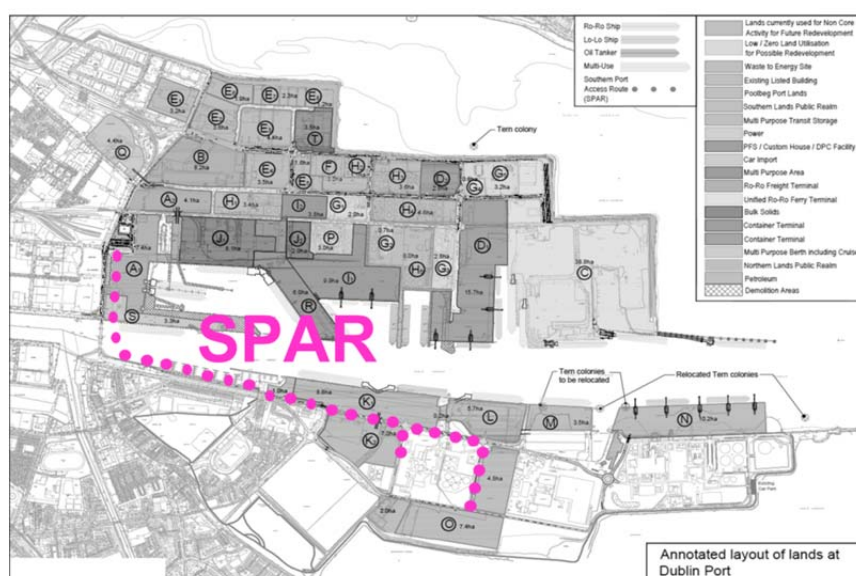
The SPAR concept is a proposed new route linking the Dublin Port Tunnel to the Poolbeg Peninsula providing access for Port traffic and for traffic to adjoining areas.

The infrastructure options originally identified in the Masterplan included a possible new north-south Port interconnector bridge. Since then, the NTA has included proposals in its Transport Strategy for the Greater Dublin Area 2016-2035 to improve connectivity between Dublin Port Tunnel and the South Port area by the building of the SPAR. This opens up the possibility of significant additional port capacity on Dublin Port's brownfield sites in Poolbeg Peninsula, which is important to provide the final capacity envisaged in the Masterplan Review.

DPC has progressed an option for the SPAR designed to keep Port traffic within the Port Estate, reducing impacts on the local public road network.

The DPC SPAR concept, as per the Masterplan Review, is indicated on Figure 2.3 below (Figure 2.3 is based on Figure 3 of the Masterplan Review document.)

Figure 2.3 – Annotated Layout of Lands at Dublin Port, Highlighting the SPAR Concept



As highlighted in the Masterplan Review, the SPAR concept is consistent with national and regional planning policy:

- The NTA has included proposals in its Transport Strategy for the Greater Dublin Area 2016-2035 to improve connectivity between Dublin Port Tunnel and the South Port area by the building of the SPAR;
- The National Planning Framework identifies this project as part of National Strategic Outcome 4 (High Quality International Connectivity) which includes “Facilitating the growth of Dublin Port through greater efficiency, limited expansion into Dublin Harbour and improved road access, particularly to/from the southern port area”;
- Within National Development Plan 2018-2027, the National Roads Programme 2018-2027 identifies the SPAR for pre-appraisal / early planning.

DPC believes that the SPAR:

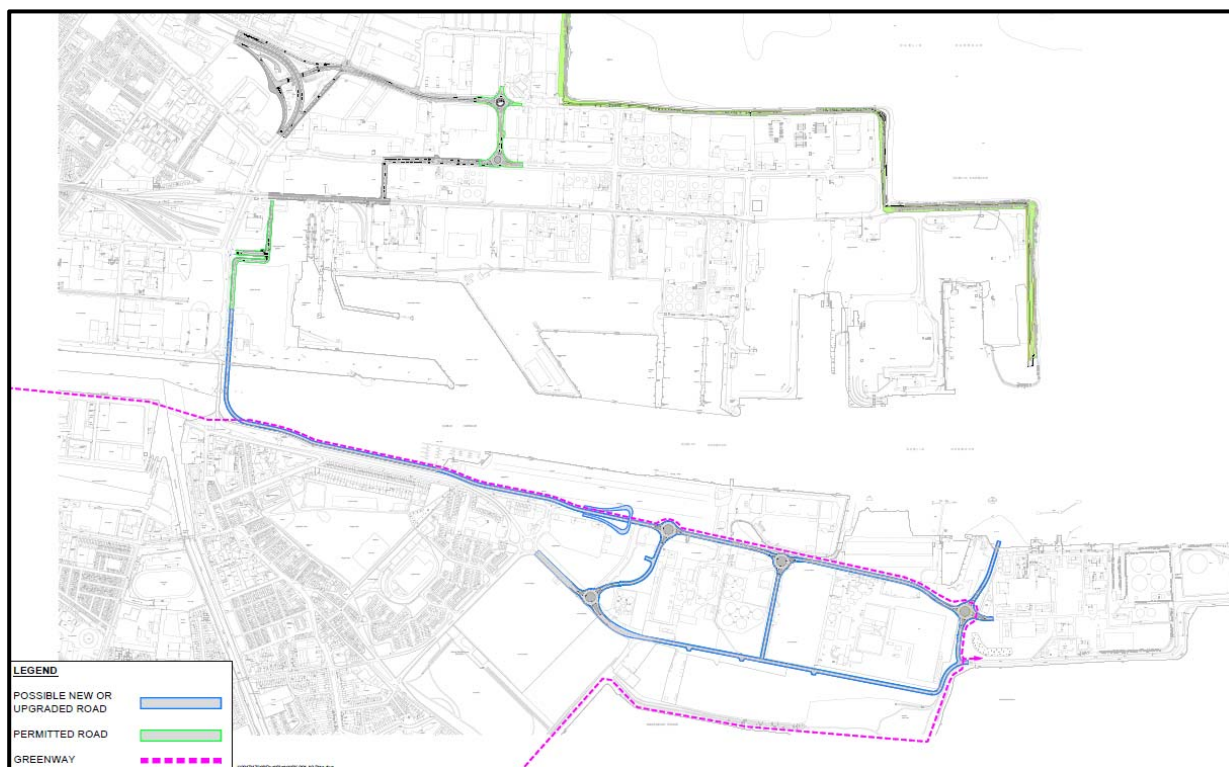
- Should be considered separately from the Dublin Eastern Bypass;
- Can be completed largely using private road space within Dublin Port and, in this way, can be constructed and operated with minimal impact on the local urban environment;
- Can meet Dublin Port’s requirement to have a route for additional Port-related HGV traffic between the Dublin Port Tunnel and the Poolbeg Peninsula;
- Can additionally provide a congestion free route for public transport to and from the Poolbeg Peninsula;
- Can be completed by DPC by 2030.

The SPAR is one the most significant transportation proposals included in the Masterplan Review and has been the focus of detailed assessment in the transport modelling section of this report.

2.6.1 The Design and Routing of the SPAR

The indicative design and routing of the SPAR that has been used within this report for modelling purposes is indicated in Figure 2.4 and included in further detail in Appendix 1.

Figure 2.4 – The Indicative Design and Routing of the SPAR that has been used within this Report for Modelling Purposes



The SPAR will have an at-grade river crossing and is considered to have one lane each way at the river crossing section. It links between the consented roads project in the Northern Lands and the proposed new road improvements in the Southern Lands.

2.6.2 Traffic Streams Permitted to Use SPAR

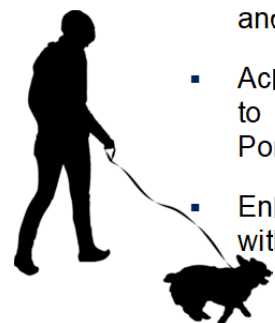
Importantly to note that within this Study it has been considered that:

- The SPAR will be a private a road that accommodates both northbound and southbound Port related traffic;
- Public transport services will be permitted to use the SPAR to facilitate enhanced services to the Poolbeg Peninsula, providing a congestion free route and facilitating the delivery of an important component of the transport strategy in the Poolbeg West SDZ Planning Scheme;
- Access will be allowed for other industrial traffic, notably for the Waste-to-Energy plant to take heavy traffic on the Poolbeg Peninsula away from existing residential areas and from new developments in the Poolbeg West SDZ Planning Scheme;
- It is envisaged that there will be a vehicular connection between SPAR and the new Port Access on East Wall Road at Upper Sheriff Street described above.

3. WALKING AND CYCLING

There are several objectives within the Masterplan Review in relation to the importance of providing much improved walking and cycling facilities within the Port Estate. These include:

- Promote movement linkages in the form of pedestrian and cycle routes;
- Promote Dublin Port for recreation and amenity by highlighting walks and cycle routes offering facilities for bird watching and viewing wildlife, views of the Bay and the wider environment;
- To promote in the development of future port facilities the principles of universal design to make environments inherently accessible for those with and without disabilities;
- Facilitating public access to the Port in a manner which is consistent with the safe and secure operation of a modern busy Port;
- Facilitate multi-modal integration between public transport facilities and walking and cycling facilities;
- Provide viewing areas along the northern fringe of the Port overlooking the Tolka Estuary;
- Examining the opening of access to the Great South Wall eastwards from Pigeon House Harbour on the Poolbeg Peninsula;
- Maximise public access to the waterfront and enhance the public realm by landscaping and by high cleanliness standards;
- Achieve closer integration with the City and people of Dublin through a commitment to respect soft values associated with the location, operation and impact of the Port;
- Enhance the general aesthetics / visual impact of the Port around the interface with the City.



In addition to the provision of the walking and cycling related infrastructure, the Masterplan Review includes a commitment to implement initiatives which support pedestrians and cyclists within and in the vicinity of the Port both for recreational and for access purposes, and this will be an objective of the new Dublin Port Travel Plan. This includes the provision of cycle lockers at Port Centre to facilitate workers in the Port to use public transport and integrate their commute with the proposed cycle facilities.

Figure 3.1 shows the Indicative Internal Road, Cycle and Pedestrian Networks at Dublin Port, Northern Lands. This is a replica of Figure 6 of the Masterplan Review included for convenience. Figure 3.2 highlights in a similar way the key walking and cyclist related aspirations within the Southern Lands and the Poolbeg Peninsula, as extracted from Figure 3 of the Masterplan Review. Appendix 2 includes 12 images that bring into focus some of the key aspects of the enhanced walking and cycling network on both the Northern and Southern Lands.

The diagrams together emphasise the extensive nature of the additional walking and cycling facilities that are contained within the Masterplan Review. These will provide much enhanced improvements over the existing infrastructure, and contribute towards achieving the Port's aspirations relating to social integration and integration of sustainable transport modes.

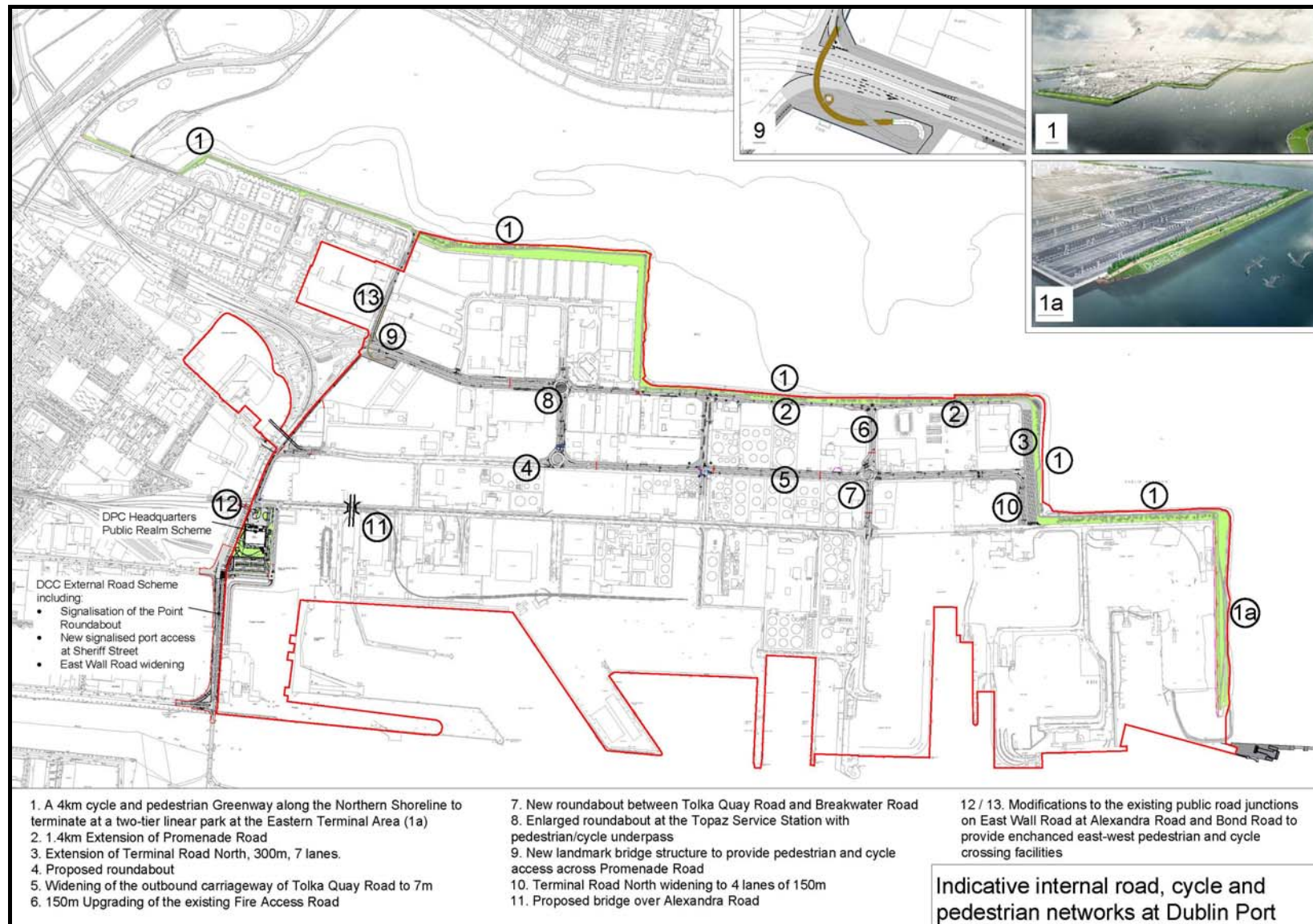
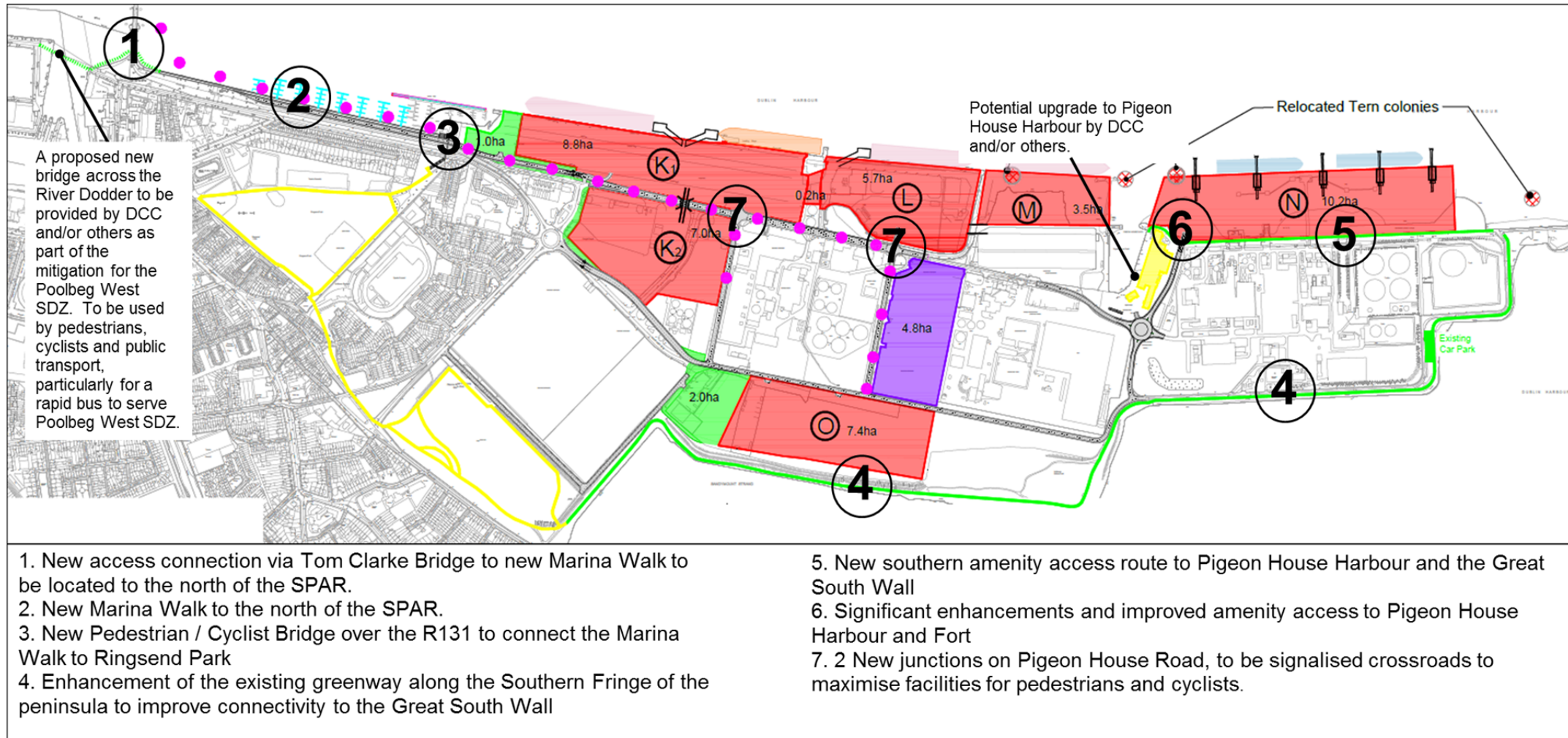
Figure 3.1 – Indicative Internal Road, Cycle and Pedestrian Networks at Dublin Port, Northern Lands

Figure 3.2 – Indicative Internal Road, Cycle and Pedestrian Networks at Dublin Port, Southern Lands and Poolbeg Peninsula

4. PUBLIC TRANSPORT

4.1 EXISTING PUBLIC TRANSPORT PROVISION

A review of the existing public transport services in the environs of the Port has been carried out and are summarised in Figure 4.1. They include the following:

- Bus Facilities:

- Local Bus Facilities - Dublin Bus;
- Regional Bus Facilities - Bus Éireann;
- Smaller Bus Companies - There are many smaller bus companies that operate in and around Dublin. The two main operators that serve the Port area are Swords Express and Aircoach.



- Red Line Luas:

- Currently runs from Tallaght to The Point and from Saggart to Connolly with a terminal point on The Point Plaza close to the Port.

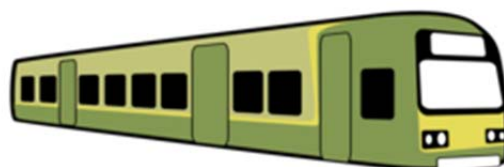
- East Point Shuttle Bus:

- A Private shuttle bus that connects the DART and the Luas to the East Point Business Park at the northwest of the Port. The East Point Shuttle Bus is run by East Point Business Park and has two routes servicing Clontarf Road Dart Station and the Point Luas stop. There is no charge to use the shuttle bus.



- The DART:

- Dublin's Electric Rail System. It stands for Dublin Area Rapid Transit. It runs along the coast of the Irish Sea from Malahide or Howth in north County Dublin southwards as far as Greystones, County Wicklow. DART services operate every 15 minutes throughout the day.

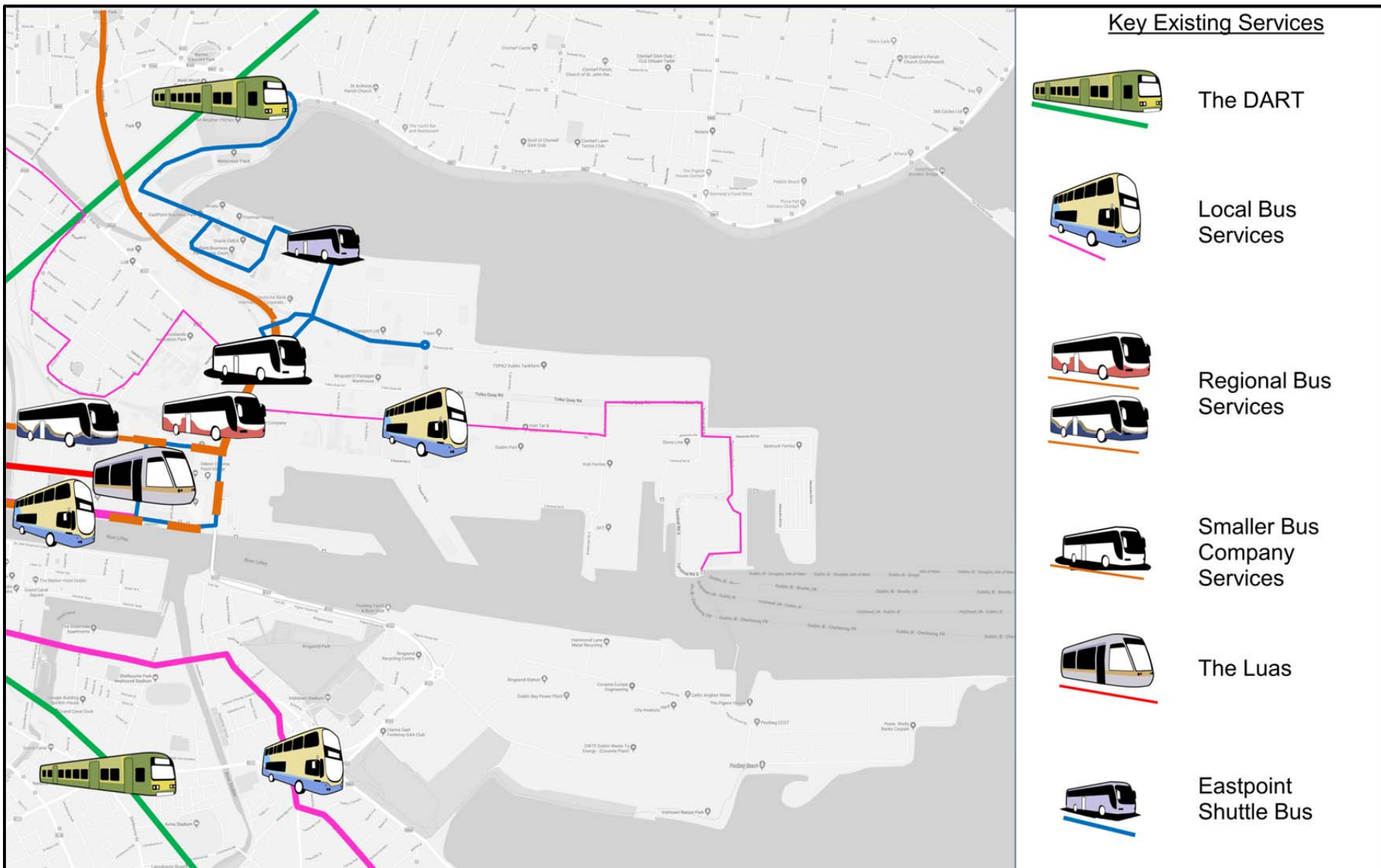


- Local Rail Services:

- The closest local rail station to Dublin Port is Docklands station which is approximately 800 meters from the Northern Lands.



Figure 4.1 – Summary of Existing Public Transport Provision in the Port and Surrounding Environs



As Figure 4.1 illustrates, there are a significant level of public transport provision in the area to the west of the Port.

The improvement in transport links provided by the construction of the LUAS line to the 3 Arena in particular has made the Port area more accessible.

The most serviced bus stops are located at the North Wall Quay and East Wall Road near the 3 Arena which serve Northern Lands. An examination of the timetables and access point locations indicate that the frequency and accessibility to public transport facilities within the East Wall Road environs is potentially excellent.

However, Figure 4.1 highlights that the provision of public transport within the Port Estate is minimal, evidenced by the large gaps in the public transport provision on the Port lands and the Poolbeg Peninsula.

In the Northern Lands one service serves the Port internally along Alexandra Road, connecting to the existing Ro-Ro (Roll on, Roll off) ferry services at Terminals 1 and 2. This bus is limited in frequency of services and in routing.

There are no services that penetrate the Poolbeg Peninsula or the Southern Lands, and no external services along the R131 or Sean Moore Road that serve the periphery of the Peninsula. Only existing bus stops at Sandymount and Tritonville Road serve the south side of the Liffey, and these have walking distances that exceeds the preferred maximum lengths.

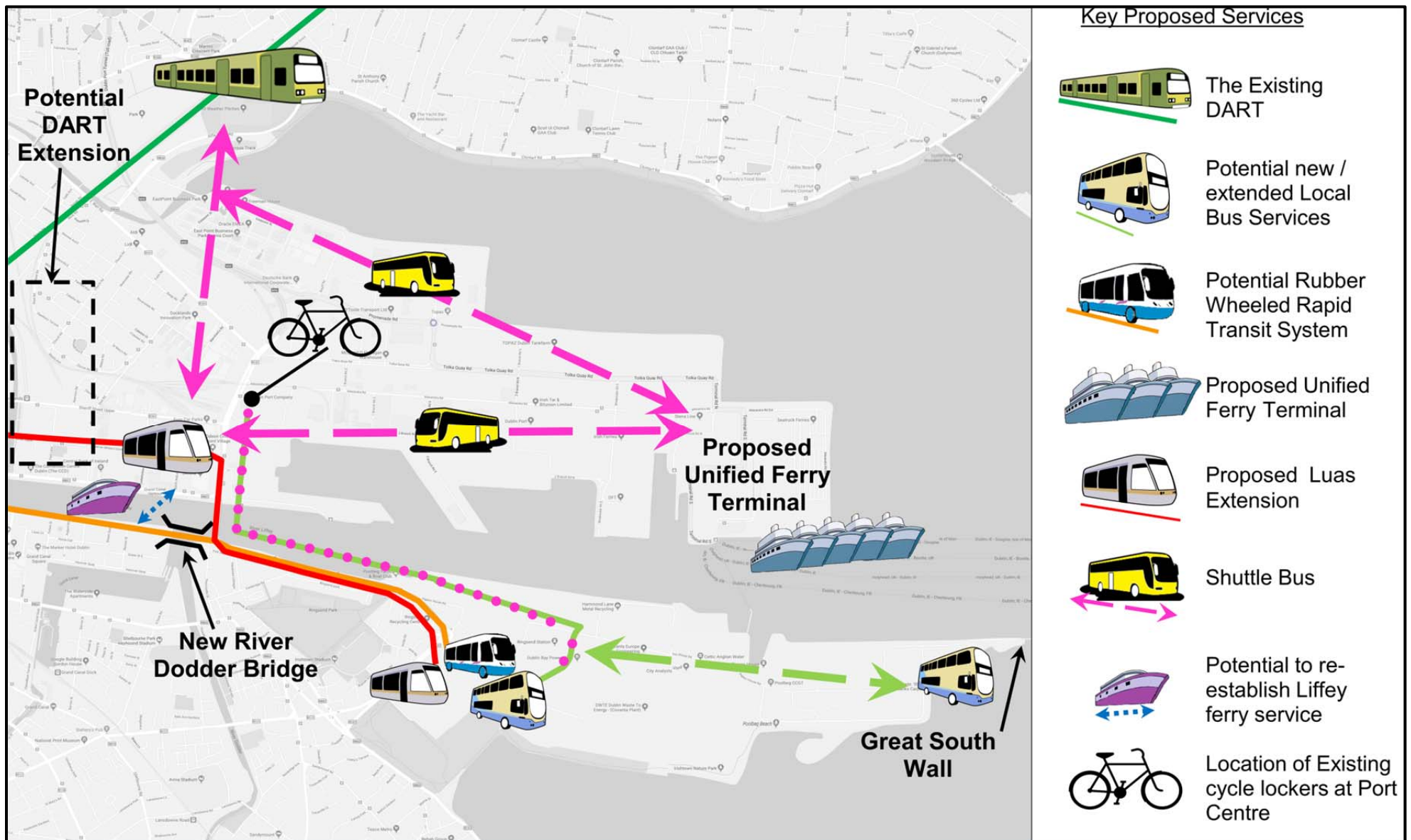
Note also that there are no current public transport services crossing the Liffey over the Tom Clarke Bridge. The only method of connection between the public transport services located north of the Liffey and the Poolbeg Peninsula is on foot and by bike, and the current walking and cycling infrastructure is limited in this location.

Integrated services are also a challenge. Only the East Point Shuttle Bus connects the dominant commuting land use zone of the East Point Business Park to the Luas and the Dart in an integrated manor.

4.2 PROPOSED / POTENTIAL FUTURE PUBLIC TRANSPORT PROVISION

Figure 4.2 summaries diagrammatically the suite of committed and proposed public transport enhancements being proposed by DPC within the Masterplan Review and by others.

Figure 4.2 – Summary of Proposed Public Transport Provision in the Port and Surrounding Environs



The services illustrated in Figure 4.2 include the following:

Aspirations of the Masterplan Review

- Public transport services permitted to use the SPAR to facilitate enhanced services to the Poolbeg Peninsula in a north-south direction and over the Liffey. This provides a congestion free route and facilitates the delivery of an important component of the transport strategy in the Poolbeg West SDZ Planning Scheme.
- Development of an innovative and environmentally friendly (e.g. electric or hydrogen fuelled) bus operation to service the Port Estate, including passenger ferry terminals, and to link the Port to Dublin City's public transport networks. This public transport provision could be through either the provision of a dedicated bus route or the extension of the existing bus route to link the LUAS terminal at the 3 Arena to the Unified Ferry Terminal, and potentially to the DART.
- The objective to increase public transport links through the Poolbeg Peninsula down to the Great South Wall, again with the potential to use the SPAR.
- The Development of a partnership with DPC, DCC and the Irish Nautical Trust to re-establish a Liffey ferry service using Ferry Number 11 (the last remaining ferry). This would provide an additional option for crossing the Liffey and further enhance multi-modal integration with public transport.
- The location of the cycle lockers at Port Centre to facilitate workers in the Port to use public transport in an integrated multi-modal manner.

Possible Enhancements to be provided by Others

- The concept of the Luas extension over the Liffey as referenced in the Transport Strategy for the Greater Dublin Area for 2016-2035, and as has been incorporated into the Poolbeg West SDZ concept plan.
- The provision of a new bridge across the River Dodder to provide cycle and walking connectivity, and public transport services to serve the Poolbeg West SDZ Planning Scheme in an east-west direction, possibly by a rubber wheeled rapid transit service.
- The indicative location of the potential DART Underground Project, as part of the Dart Expansion Programme. The project is currently back into option review stage, and if it comes forward within the life of the Masterplan could enhance rail options that either directly or indirectly benefit users of the Port.

4.3 ASSESSMENT OF PROPOSED PUBLIC TRANSPORT ENHANCEMENTS

It can be seen visually from comparing Figure 4.1 with Figure 4.2 that the suite of committed and proposed public transport enhancements being proposed by DPC within the Masterplan Review, and by others, will fill the gaps in the public transport provision that currently exists.

The Northern Lands will have a more frequent bus service, which connects the dominant person generating land use zone of the Unified Ferry Terminal to the Luas, and potentially the Dart, in an integrated manor. This service, combined with the enhanced internal roads, walking and cycle facilities being provided by DPC, facilitates a multi-modal integrated sustainable transport option.

The Southern Lands and the Poolbeg Peninsula will be served by several public transport options, providing enhanced connectivity and synergies for both the Port lands and the Poolbeg West SDZ Planning Scheme. Again, the improvements in walking and cycling connections on the Poolbeg Peninsula, including the committed DCC scheme at East Wall Road to signalise the Point Roundabout, facilitates multi-modal integrated sustainable transport options.

Additionally the current lack of connection across the Liffey is addressed by the DPC proposal to allow public transport services on the SPAR, the potential extension of the Luas Red Line and the potential re-establishment of the Liffey ferry service. Note also that the provision of the SPAR will remove traffic from the Tom Clarke Bridge, particularly heavy vehicles, potentially providing the opportunity for improved pedestrian and cycling facilities on the bridge.

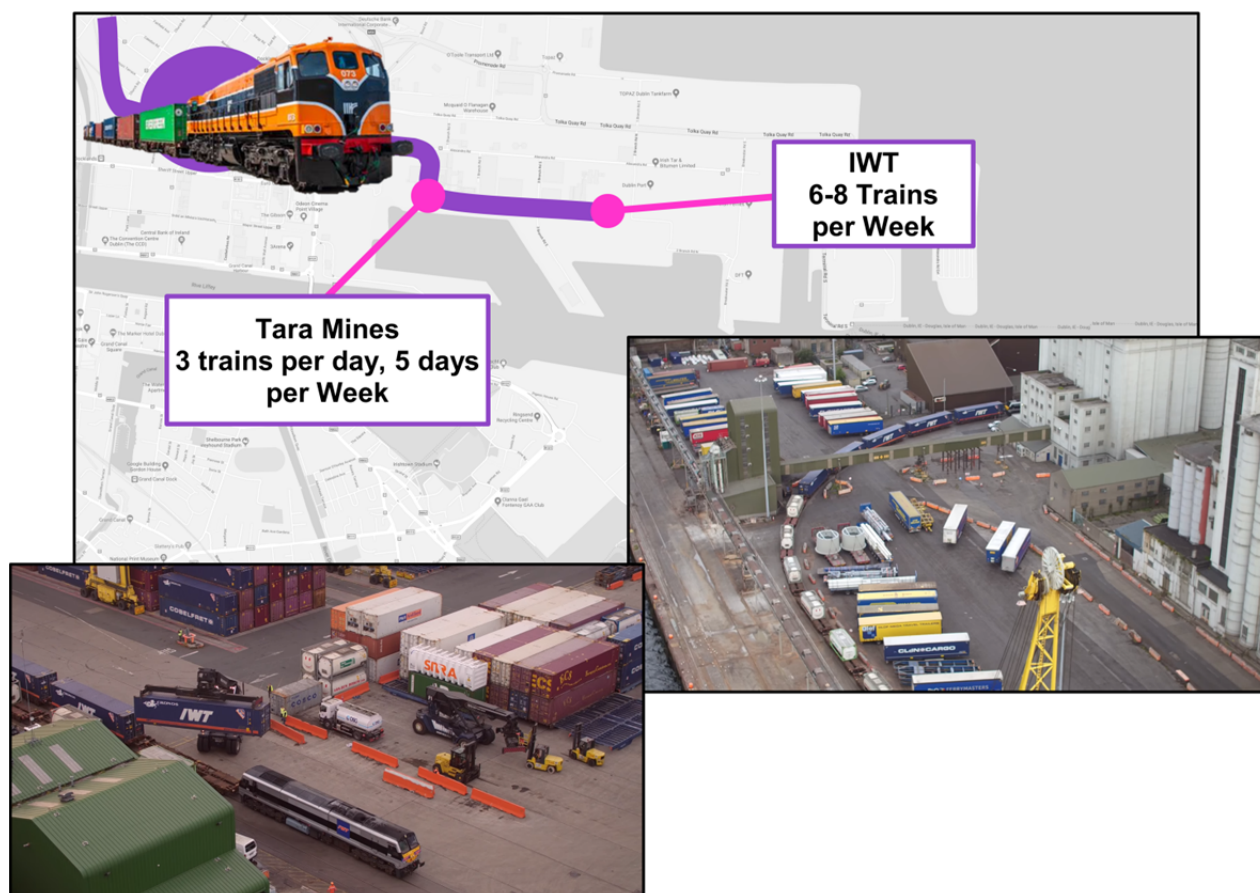
The Port is a key component of the national tourism sector and represents a gateway for visitors to Ireland. The enhanced suite of sustainable transport provisions provide a range of opportunities for tourists to the Port the passengers from cruise ships, berthed at the North Wall Quay Extension as part of the ABR Project, to access the city directly and ensure an increased usage of the city's public transport infrastructure.

The diagrams together, Figure 4.1 existing and Figure 4.2 proposed, illustrate how the public transport aspirations within the Masterplan Review contribute towards the provision of substantially enhanced sustainable transport provision within the Port and its environs. These will contribute towards achieving the Port's aspirations relating to social integration, its role as a gateway for visitors to Ireland and integration of sustainable transport modes.

5. RAIL FREIGHT

As stated in the Masterplan Review, Dublin Port is at the heart of the national rail network with direct connections to all major centres of population. DPC has maintained and developed the main rail infrastructure within the Port and is committed to the provision of rail connections and sidings within the Port. An indication of the existing route and frequency of services is shown in Figure 5.1.

Figure 5.1 – Route and Frequency of Existing Rail Freight Services at the Port



DPC will continue to promote the use of rail freight through the movement of containers and bulk solids by rail. A sign of this commitment is the development of the 1.6km rail spur at Dublin Port which was opened in July 2011. DPC continues to examine the potential for private sector operators to offer container freight services to a range of destinations, an objective that will be included in the new Dublin Port Travel Plan.

In the period since 2012, there has been increased use of rail freight in Dublin Port with longer container freight trains introduced on routes following trials in 2016.

DPC believes that if market demand develops to the full set of potential services, the annual volume of containerised freight moved by rail could reach 1.3m tonnes or 130,000 TEU. There is also potential for increased movement of bulk solids and petroleum products by rail subject to market demand.

The existing rail infrastructure has been carefully retained in the Masterplan Review to ensure its continued use.

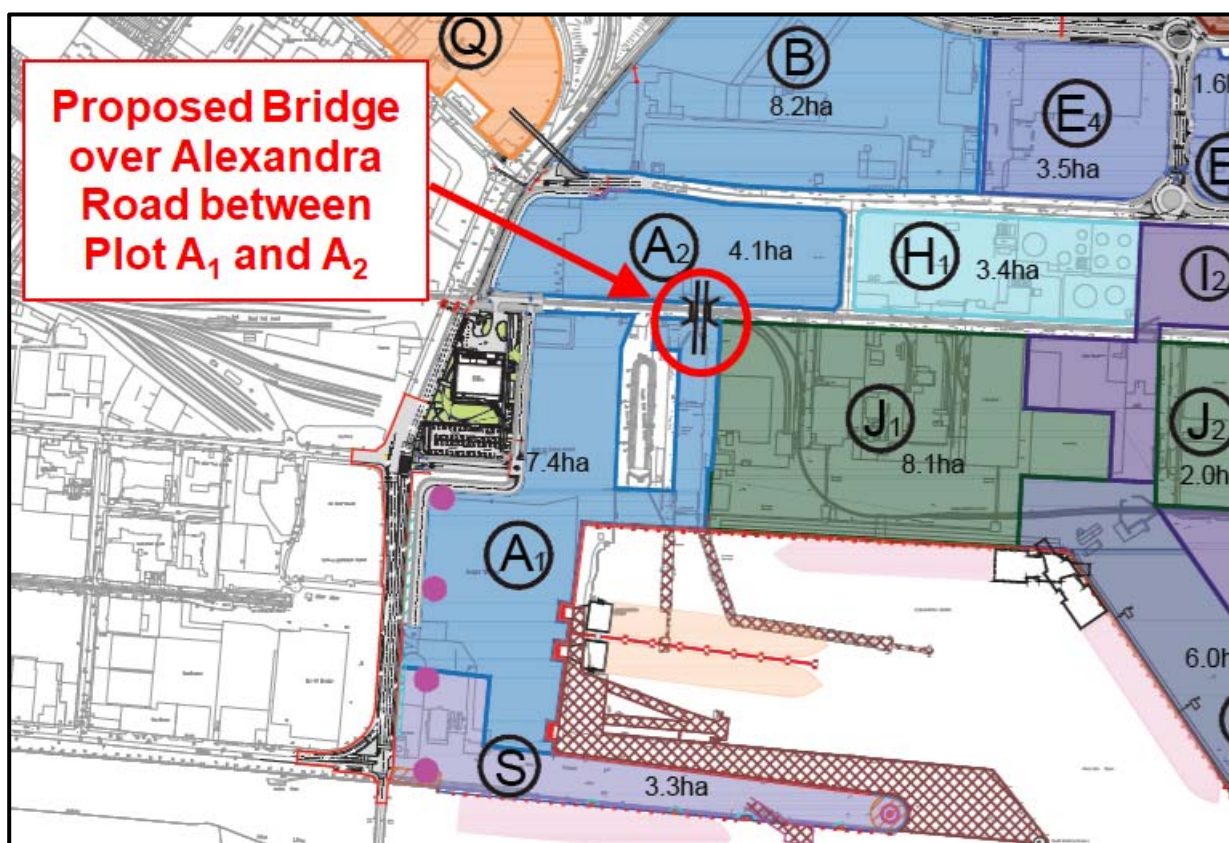
The rail freight services access the Port via Alexandra Road junction with East Wall Road, which although will be closed to all operational Port traffic, will continue to accommodate the rail freight services.

The SPAR will interact with the railway along an internal section of the Alexandra Road. Traffic management will continued be required to manage this interaction, similar to the traffic management that is already an established daily practice within this area.

Figure 3 of the Masterplan Review report indicates the location of a bridge over the Alexandra Road, as highlighted in an extract in Figure 5.2 below.

This bridge will eliminate the disruption between the rail freight services and operational vehicles traversing between Plot A₁ and Plot A₂, which have been identified for unaccompanied Ro-Ro freight and will therefore have a relatively high frequency of vehicular movements.

Figure 5.2 – Proposed Bridge over Alexandra Road between Plot A₁ and Plot A₂



The continued promotion for use of the rail and the careful retention of existing infrastructure and access routing is consistent with one of the core challenges in the EU White Paper (Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, 2011) to ensure that the Port is sufficiently connected to the rail freight and a modal shift towards its use is encouraged.

6. TRANSPORT MODELLING APPROACH

Strategic transport modelling has been carried out to assess the impact of the proposed increase in growth at the Port and the proposed transport related infrastructure enhancements included in the Masterplan Review on the strategic and local road network.

The proposed AAGR of 3.3% per annum over the 30 years from 2010 to 2040 at the Port, rather than the 2.5% originally assumed in 2012, and the inclusion of the SPAR have been central features of the transport modelling.

A three-stage approach has been used to forecast future traffic levels in the vicinity of the Port.

The first stage was preliminary analysis of traffic data to establish volumes of Port-related traffic and constraints to traffic growth.

The second stage used a simple local all-day traffic model, based on observed traffic levels, to compare future traffic flows with and without the proposed SPAR.

The third stage involved more detailed modelling based on a run of the NTA's strategic multi-modal model of the Greater Dublin Area.

RPS met with and liaised with NTA on an-going basis between October 2018 and March 2018 in relation to the run of their strategic multi-modal model.

7. ANALYSIS OF TRAFFIC DATA

This chapter presents the evidence for existing volumes of motorised road traffic to and from the Port.

7.1 NORTHERN LANDS

Current traffic volumes to and from the Northern Lands were estimated, based on turning movement surveys carried out for a 24-hour period in May 2014. The Port access layout at this time was substantially the same as at present, with four principal entrances/exits from the Northern Lands – Promenade Road, Alexandra Road, existing access to Terminal 3 (currently occupied by Ro-Ro Operator, P&O) and access to Cruise Terminal on the North Wall Quay Extension. These are illustrated in Figure 7.1 below.

Figure 7.1 – Dublin Port Northern Lands – Access Points

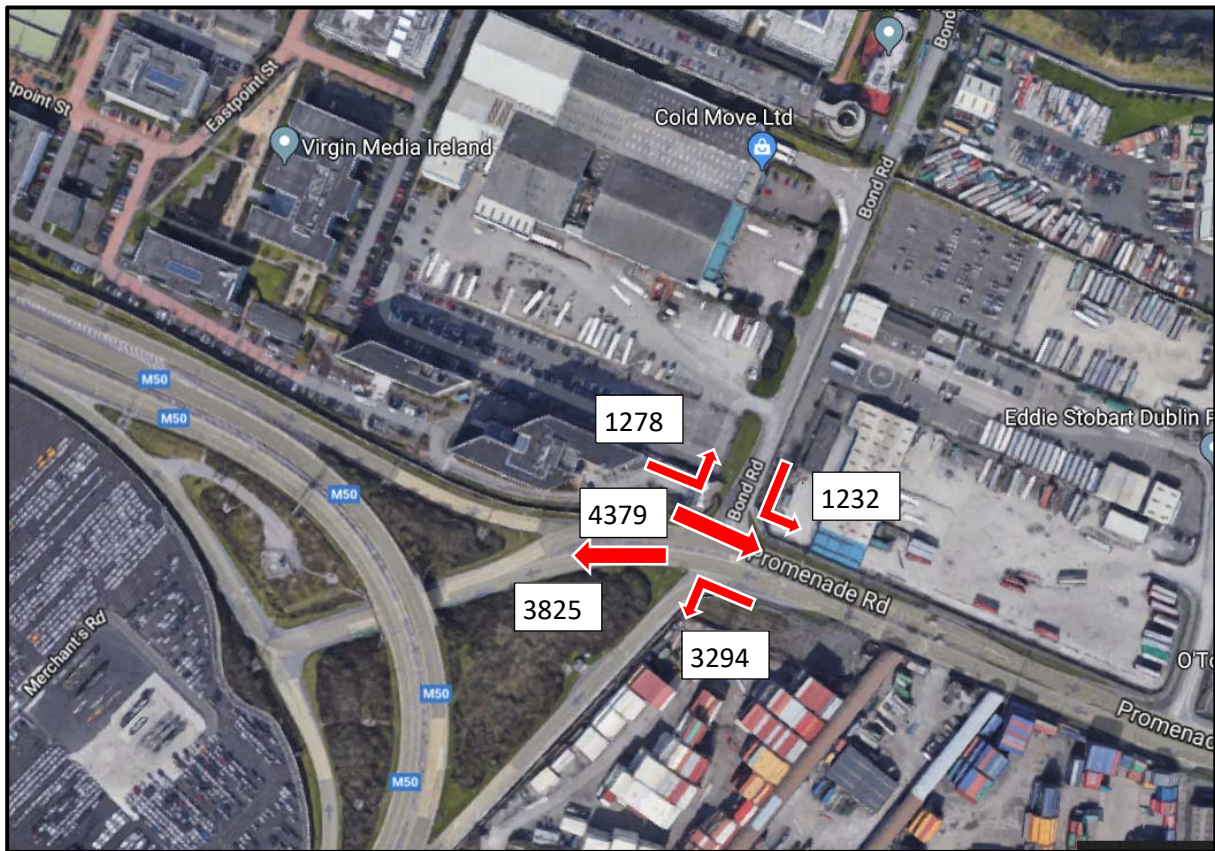


In addition, the Port Estate includes a Car Import Storage Facility, with a main entrance onto East Wall Road. A one-way private road bridge over the East Wall Road connects this facility to the main Northern Lands. Imported cars are driven across the bridge to the storage facility. This movement is entirely within the Port lands and does not impact on the public road network. From this facility, the cars are loaded onto transporters, which exit onto East Wall road and drive to the Dublin Port Tunnel. This movement is captured in the traffic counts and treated as non-Port traffic.

The following diagrams show the observed traffic flows, in units of vehicles per 24-hour weekday.

7.1.1 Promenade Road / Bond Road

Figure 7.2 – Daily Vehicle Movements at Promenade Road / Bond Road Junction



The cold storage facility on Bond Road forms part of the DPC lands, and vehicles to and from this site are to be included as Port-related traffic. However, Bond Road is also used as a secondary entrance to East Point Business Park, which is non-Port-related traffic.

As an initial approximate estimate, 20% of light vehicle trips and 80% of heavy goods vehicle trips on Bond Road are taken to be Port-related.

As there is no right turn from Bond Road at this junction, traffic exiting the Port has to turn left, and then u-turn at the roundabout on Promenade Road. The non-Port element of this movement is therefore subtracted from the observed flows leaving the Port.

Total Port traffic inflow at this junction is estimated at 4700 veh/day.

Total Port traffic outflow at this junction is estimated at 6190 veh/day.

These flows are indicated on Figure 7.2 above.

7.1.2 Alexandra Road

Figure 7.3 – Daily Vehicle Movements at Alexandra Road / East Wall Road Junction



The right turn exiting from Alexandra Road is not legally permitted.

Total Port traffic inflow at this junction is observed at 3060 veh/day.

Total Port traffic outflow at this junction is estimated at 1710 veh/day.

Note that at the Alexandra Road junction, inflow exceeds outflow by approximately 1400 vehicles per day. Whilst at the Promenade Road junction, outflow exceeds inflow by approximately 1400 vehicles per day. What appears to be happening here is that the right turn ban out of Alexandra Road means that a significant volume of the traffic from this part of the Port to the Port Tunnel uses the Promenade Road exit instead.

These flows are indicated on Figure 7.3 above.

7.1.3 Terminal 3 Access (P&O) & Cruise Terminal Access

Figure 7.4 – Daily Vehicle Movements at the Terminal 3 Access (P&O) & Cruise Terminal Access



Total Port traffic inflow at these junctions is observed at 725 veh/day.

Total Port traffic outflow at this junction is estimated at 740 veh/day.

These flows are indicated on Figure 7.4 above.















The total of the above movements amounts to approximately 17,000 vehicles per day entering and leaving the Northern Lands to/from the local road network, as summarised in Table 7.1 below.

Table 7.1 – Arrivals and Departures of Existing Vehicles at the Accesses to the Northern Lands by Vehicle Type

Year	Direction	CAR	LGV	OGV1	OGV2	BUS	M/CYCLE	total
2014	In							
	Cruise Terminal	34	12	0	5	20	4	75
	P&O access	140	41	136	314	13	2	646
	Alexandra Rd	1491	206	142	993	163	29	3024
	Promenade Rd	1856	354	511	1852	54	39	4666
	TOTAL	3521	613	789	3164	250	74	8411
	Out							
	Cruise Terminal	37	11	0	0	25	0	73
	P&O access	133	30	145	356	1	3	668
	Alexandra Rd	1065	136	82	228	131	35	1677
	Promenade Rd	2310	422	545	2733	82	58	6149
	TOTAL	3545	599	772	3317	239	96	8567
	2-way TOTAL	7065	1212	1561	6481	489	170	16978
	<i>share</i>	<i>42%</i>	<i>7%</i>	<i>9%</i>	<i>38%</i>	<i>3%</i>	<i>1%</i>	<i>100%</i>

The vehicle categories used in Table 7.1 above are industry standard and are defined in Table 7.2 below.

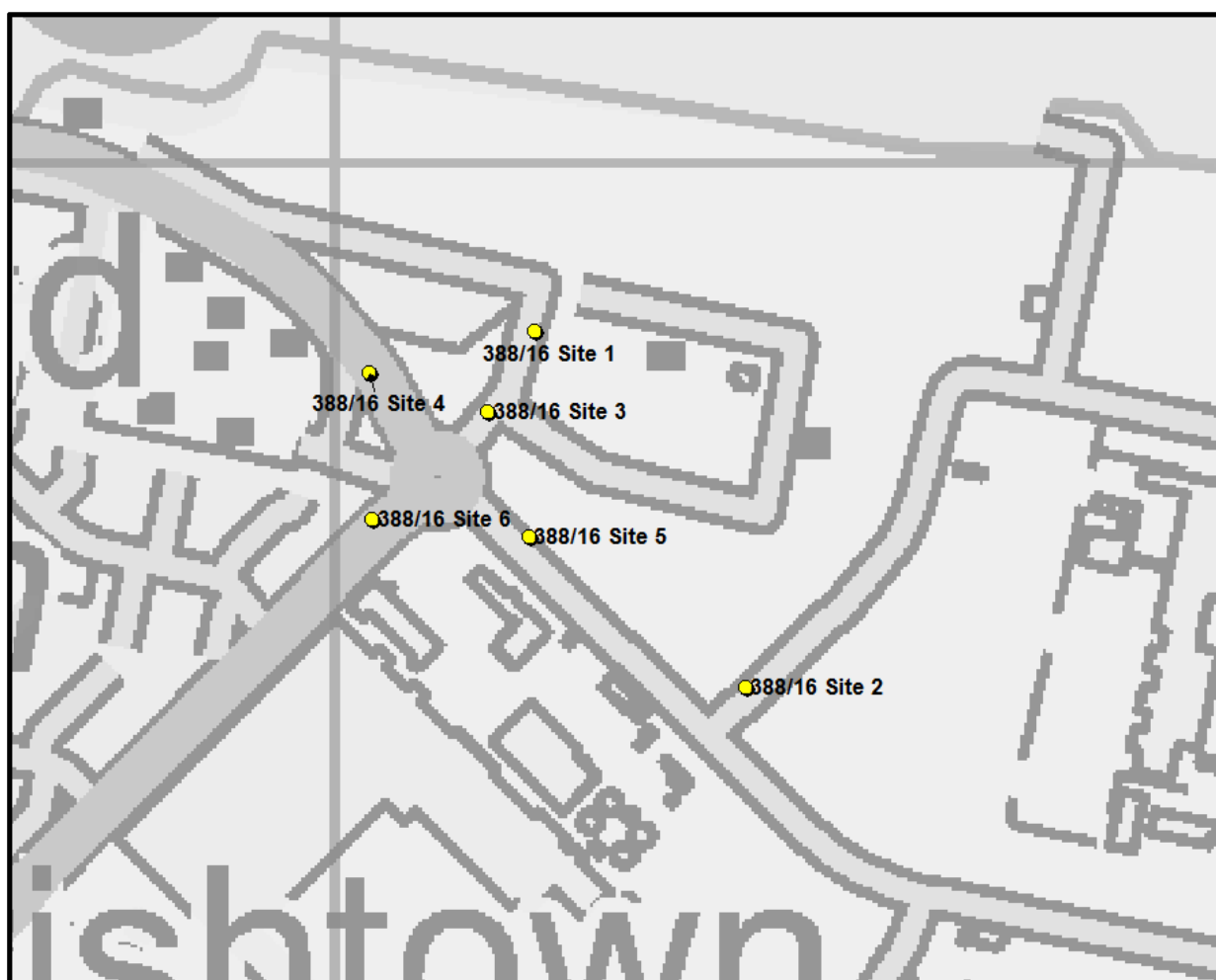
Table 7.2 – Industry Standard Vehicle Classification

Class	Description	Typical Length (m)
Push Cycle		0.96-2.32
Motor cycle	  Motorcycles, scooters, mopeds, motor-powered bicycles and three-wheeled motorcycles.	0.96-2.32
Car/Taxi	  All passenger carrying vehicles, including those that pull light trailers: sedans, coupes, station wagons, SUVs, vans, limos, campers, motorhomes, small ambulances.	3.98-6.84
Light Goods Vehicle (LGV)	  All light good-carrying vehicles, including those that pull light trailers: pickup, panel vans, tow trucks.	3.98-6.84
Other Goods Vehicle Type 1 (OGV1)	    All rigid vehicles over 3.5 tonnes gross vehicle weight. All large vehicles on single frames: trucks, tow trucks, campers, motor homes, large ambulances.	6.17-10.50
Other Goods Vehicle Type 2 (OGV2)	 All articulated vehicles.	9.51-23.65
Bus /Coach (PSV - Passenger Service Vehicle)	  All passenger-carrying buses, including school buses and articulated buses.	9.51-13.69

7.2 SOUTHERN LANDS

Currently the only access to the Southern Lands is via the Sean Moore Roundabout. Link flows on each arm of this roundabout were surveyed for a week in July 2016. These counts were supplemented by pneumatic tube counters at two other nearby sites, and a video turning movement count at site 3.

Figure 7.5 – Location of Traffic Surveys Carried out in 2016 at the Sean Moore Roundabout Area



Currently the primary Port activity in the Southern Lands is the MTL container terminal. All traffic to and from this facility uses the main entrance at Site 3 shown above on Figure 7.5.

The other, less-traffic-intensive, Port uses are bulk goods, principally coal and scrap metal. As a broad initial estimate these were assumed to comprise 25% of the HGV traffic at Site 2, as per Figure 7.5 and 10% of the light vehicle movements.

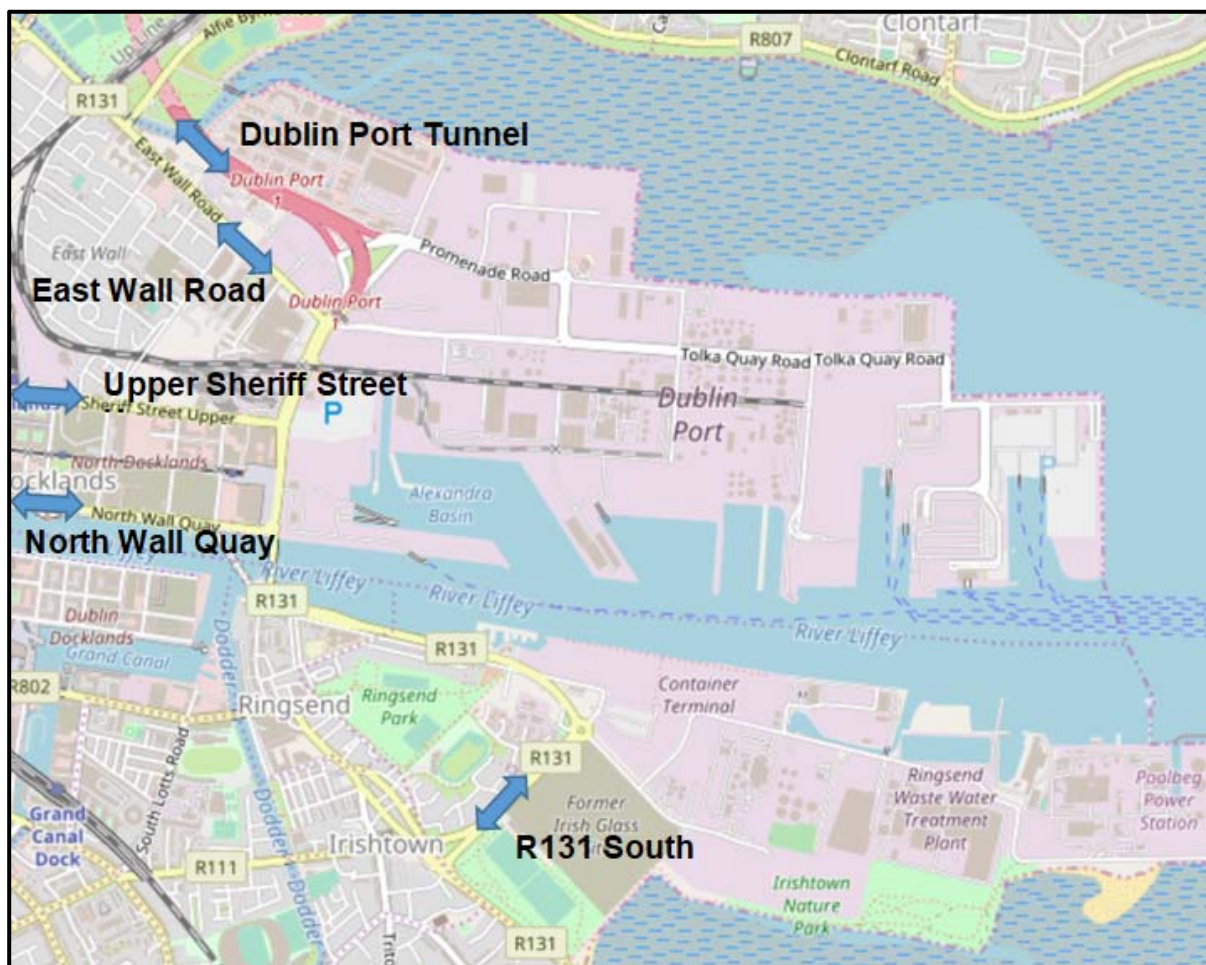
The total of the above movements amounts to approximately 1,400 vehicles per day entering and leaving the Southern Lands to/from the Seam Moore Roundabout, as summarised in Table 7.3 below.

Table 7.3 – Arrivals and Departures of Existing Port-Related Vehicles at the Southern Lands by Vehicle Type

Year	Direction	Light vehicles	OGV1	OGV2	total
2016	In				
	MTL Container	109	0	429	538
	Other	111	43	51	205
	TOTAL	220	43	480	743
	Out				
	MTL Container	98	2	371	471
	Other	104	87	14	205
	TOTAL	202	89	385	676
	2-way Total	422	132	865	1418
	<i>Share</i>	<i>30%</i>	<i>9%</i>	<i>61%</i>	<i>100%</i>

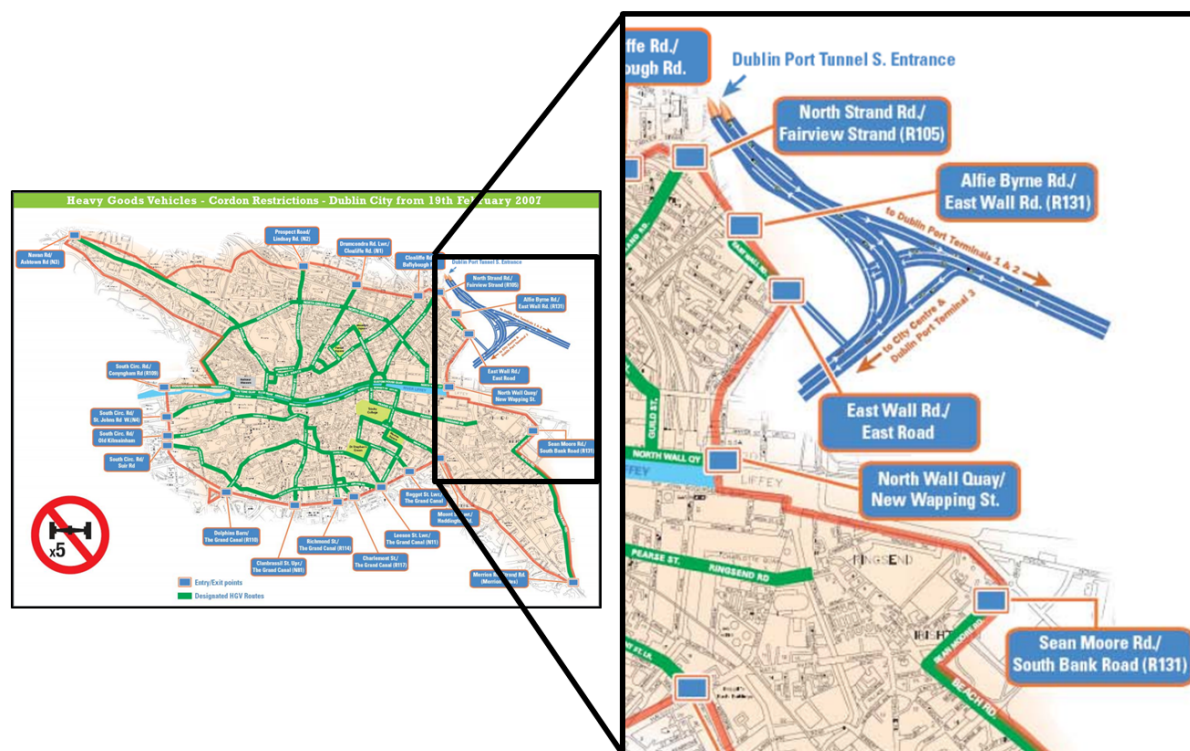
7.3 DISTRIBUTION OF PORT-RELATED TRAFFIC

There are five principal routes for vehicles leaving the vicinity of Dublin Port, as indicated in Figure 7.6 below.

Figure 7.6 – Five Principal Routes for Vehicles Leaving the Vicinity of Dublin Port

The Dublin City Centre HGV Management Strategy bans vehicles with 5 or more axles travelling between the hours of 07:00 and 19:00 to within a cordoned area around Dublin City Centre, as illustrated in Figure 7.7 below.

Figure 7.7 – Cordon Area for Dublin City Centre Management Strategy



Therefore 5+axle vehicles have no option but to use the Dublin Port Tunnel, being prohibited from using the other four routes unless they have a permit to load/unload within the city centre area. The ban came into force in 2007.

In 2011 a roadside interview survey of HGV drivers arriving at and leaving the Northern Lands recorded the proportions of vehicles using each route. The results are shown in Table 7.4 below.

Table 7.4 – Results from 2011 Origin / Destination Survey

Origin / Destination	Inbound	Outbound	Average
Port Tunnel	79%	83%	81%
East Wall Rd	5%	5%	5%
Upper Sheriff Street	2%	3%	2.5%
North Wall Quay	3%	3%	3%
R131 south	11%	6%	8.5%

This was compared with the 2014 count data. Limited information on use of the Dublin Port Tunnel can be inferred from the counts of right-turning traffic and left-turning traffic at the Promenade Road junctions and the Alexandra Road junction, summarised in Table 7.5 below.

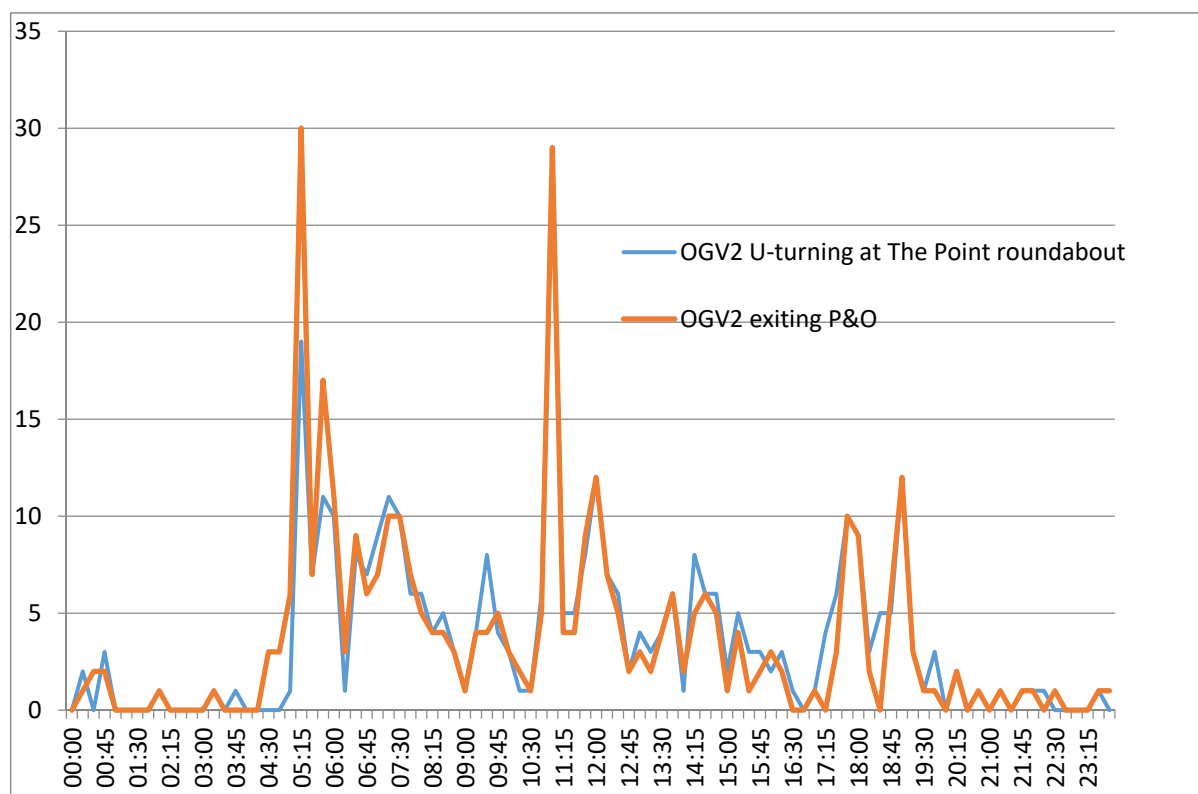
Table 7.5 – Results from 2014 Surveys – Promenade Road and Alexandra Road

	CAR	LGV	OGV1	OGV2	BUS	M/CYCLE
Exiting the Port						
Right to Port Tunnel	620	135	363	2435	20	14
Left to Other Route	2755	423	264	526	193	79
<i>Port Tunnel share</i>	18%	24%	58%	82%	9%	15%
Entering the Port						
Left from Port Tunnel	921	176	397	2329	39	17
Right from Other Route	2428	374	263	512	178	48
<i>Port Tunnel share</i>	28%	32%	60%	82%	18%	26%

Within sampling error, the results for OGV2s – which are mostly 5+axle articulated vehicles that are subject to the HGV ban – are consistent with the earlier survey.

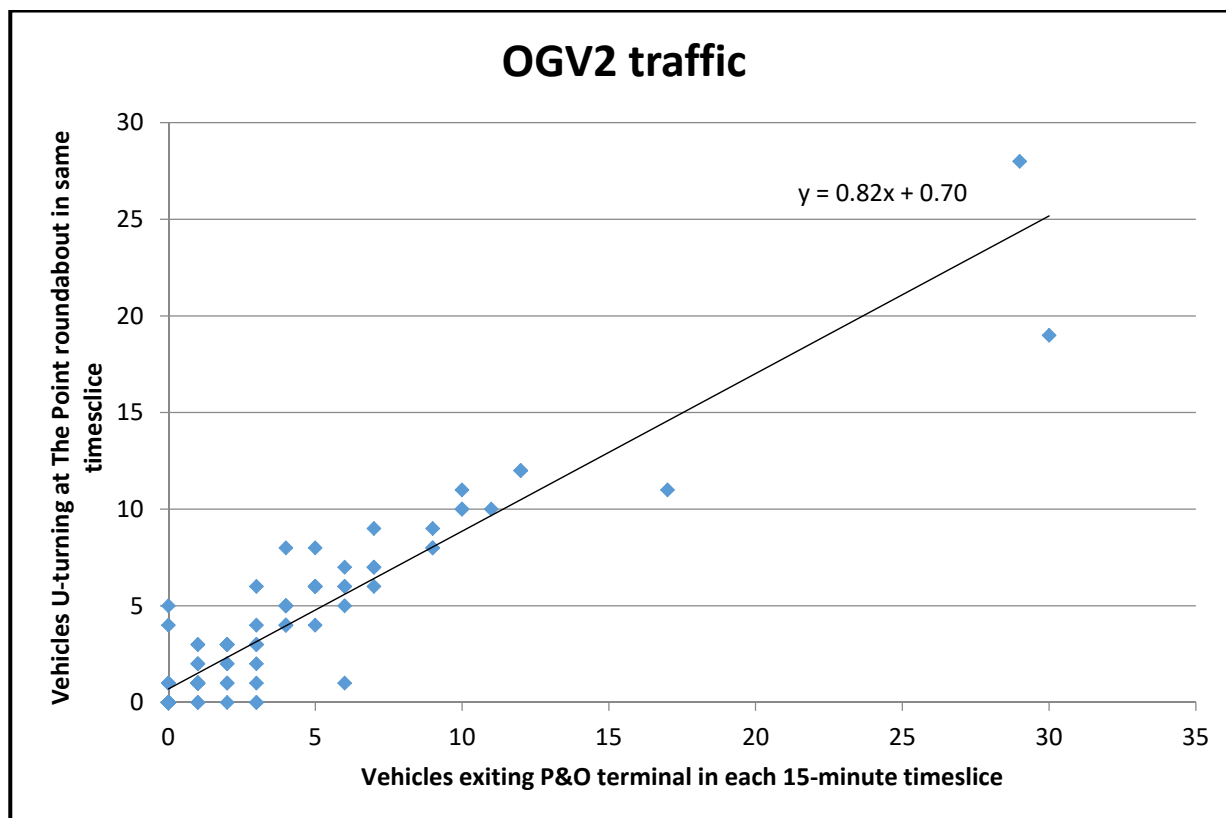
However, the dominance of the Dublin Port Tunnel does not apply to other vehicle types that are not subject to the ban (and are subject to tolls for using the Tunnel).

The banned right turns along East Wall Road cause significant volumes of traffic to u-turn at the Point Roundabout. Comparing the volumes of traffic observed exiting the P&O Terminal left onto East Wall Road southbound, with the volumes u-turning at the Point Roundabout from East Wall Road southbound to East Wall Road northbound, there is a high correlation between the two. This suggests that the P&O terminal accounts for a high proportion of these u-turning movements. This is illustrated in Figure 7.8 below.

Figure 7.8 – U-Turns at the Point Roundabout Compared with Vehicles Exiting P&O - OGV2

Regression analysis, as summarised in Figure 7.9, suggests that for OGV2 traffic, a good estimate of the u-turning traffic is 82% of the vehicles exiting the P&O terminal plus a small volume of other vehicles (0.7 per quarter-hour).

Figure 7.9 – Regression Analysis for U-Turns at the Point Roundabout Compared with Vehicles Exiting P&O - OGV2



Corresponding estimates for other vehicle types are:

- OGV1s – 86% of P&O traffic plus 0.16 vehicles per quarter-hour other traffic;
- Light vehicles – 62% of P&O traffic plus 2.3 vehicles per quarter-hour other traffic.

Allowing for the fact that the u-turning traffic includes vehicles destined for Upper Sheriff Street and East Wall Road north, these numbers are broadly consistent with the suggestion that a similar mix of destinations applies to the P&O terminal traffic as to the Promenade Road / Alexandra Road traffic.

7.4 CAPACITY OF THE DUBLIN PORT TUNNEL

7.4.1 Existing flows

Dublin Port is well connected to the national road network and in particular the Dublin Port Tunnel, which was opened in 2006, has provided fast and direct access to the strategically important M50 and M1 routes within minutes of leaving the Port.

A recent (November 2017) video traffic count at the Port tunnel toll plaza showed a typical weekday flow of around 26,700 vehicles per day AADT (Average Annual Daily Traffic), broken down as follows:

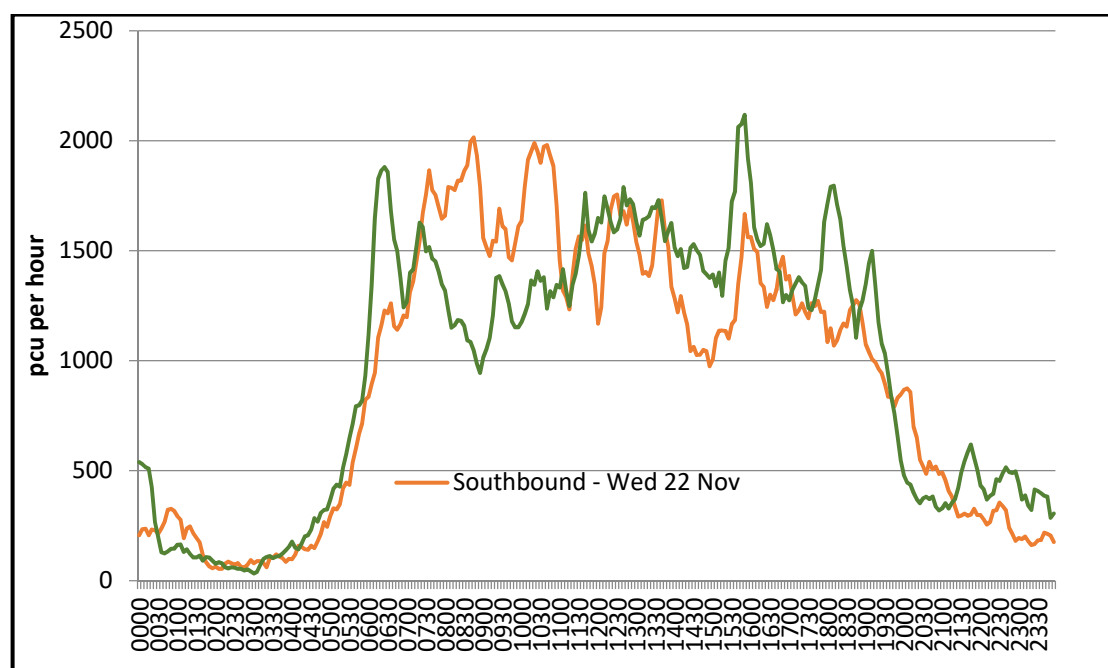
- All light vehicles (motorcycles, cars, light vans) 15,393 vehicles per day;
- OGV1s (rigid-bodied 2- or 3-axle heavy goods vehicles) 1,738 vehicles per day;
- OGV2s (articulated or 4+axle heavy goods vehicles) 8,249 vehicles per day;
- Buses and coaches 1,355 vehicles per day.

Capacity is typically measured hourly, in passenger car units (pcu). For this exercise:

- All light vehicles (motorcycles, cars, light vans) were given a pcu value of 1;
- OGV1s (rigid-bodied 2- or 3-axle heavy goods vehicles) were given a pcu factor of 1.9;
- OGV2s (articulated or 4+axle heavy goods vehicles) were given a pcu factor of 2.9; and
- Buses and coaches were given a pcu factor of 3.

These numbers are consistent with NTA usage in their Regional Transport Models. Figure 7.10 below shows observed flows in units of pcus per hour.

Figure 7.10 – Observed Flows in pcus, Dublin Port Tunnel



7.4.2 Tunnel and Toll Plaza Capacity

Within the NTA Regional Transport Model for the Greater Dublin Area, the Port Tunnel is coded with a capacity of 3800 pcus per hour per direction. The data therefore shows the Tunnel to be operating at approximately half of its modelled capacity, with one-way flows exceeding 1900 pcu/hour per direction experienced for only short periods.

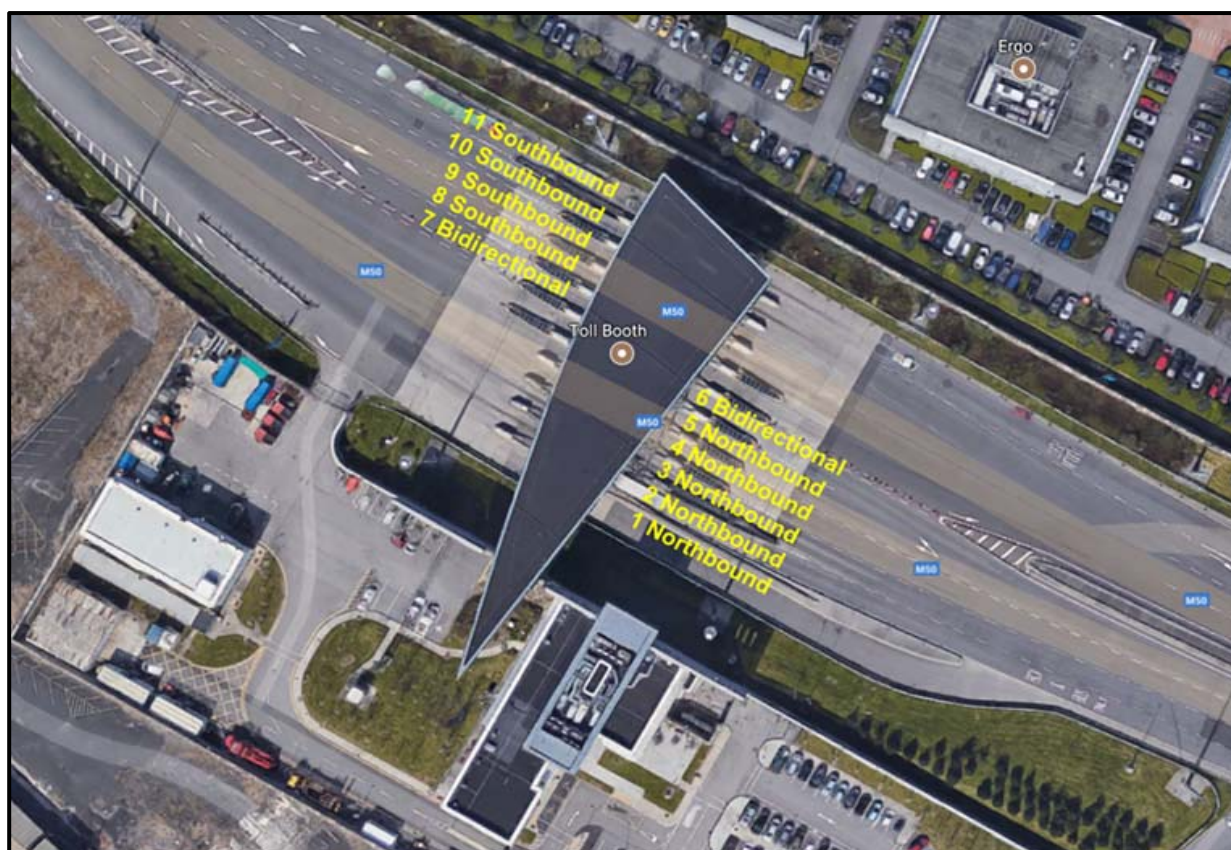
Note that this may be an underestimate of the capacity – 2-lane motorways elsewhere in Ireland have observed flows exceeding 4000 pcu/hour.

Anecdotally, it has been suggested that the “pinch point” may be the Toll Plaza – that this may have less capacity than the Tunnel itself.

A survey of traffic through the toll plaza was carried out in November 2017. The resulting observed profiles of traffic flow gives no indication that flow is hitting a “ceiling” caused by lack of capacity at the toll plaza.

There are 11 toll lanes at Dublin Port Tunnel - 5 dedicated northbound, 4 dedicated southbound and 2 that can be bi-directional, as illustrated below in Figure 7.11.

Figure 7.11 – Toll Lanes at Dublin Port Tunnel Toll Plaza



The maximum observed throughput at the toll Plaza was 187 vehicles in one 5-minute time-slice. This occurred northbound, at a time when 4 toll lanes were operating in this direction. This rate of flow equates to approximately 2850 pcu/hour.

This suggests that if the full 6 northbound lanes were operating, the capacity of the toll plaza may be around 4275 pcu / hour – sufficient for the Tunnel it serves.

In any case, Transport Infrastructure Ireland (TII) intend to replace the tolling related equipment and software at the plaza within in the next 18 months and expect the upgrade to result in the performance of the tolls to be significantly better than existing.

Furthermore, TII are considering upgrading the toll collection system to be free-flow in future years, likely to happen before the 2040 horizon year for the Masterplan.

Similarly, the East Link toll plaza has 3 lanes in each direction, implying a capacity of over 2100 pcu/hour, sufficient for the single lane Tom Clarke Bridge (previously named East Link Bridge).

7.4.3 Port traffic using the Tunnel

The following table presents an estimate of the volumes of Port-related traffic using the Tunnel on a typical weekday in 2017.

The estimates of total Port traffic from based on observed data from 2014 and 2016 as described in the preceding Section, were factored up to 2017 levels based on data from the long-term traffic counter on Promenade Road. A proportion of this traffic, based on evidence from the previous chapter, is assumed to use the Tunnel.

Table 7.6 – Calculation – Base Year Traffic using the Port Tunnel

		Light vehicles	OGV 1	OGV 2	Buses & coaches	pcu
[A]	North Docks 2-way traffic 2014	8447	1561	6481	489	31,674
[B]	= [A] factored up to 2017 traffic levels	9706	1794	7446	562	36,394
[C]	South Docks 2-way traffic 2016	422	132	865	0	3,180
[D]	= [C] factored up to 2017 traffic levels	436	136	894	0	3,288
[E]	Total 2017 Port traffic = [B] + [D]	10142	1930	8340	562	39,682
[F]	Proportion estimated to use the Tunnel	25%	60%	82%	25%	
[G]	Volume of Port Traffic using the Tunnel = [E] x [F]	2536	1158	6839	140	24,991
[H]	Total traffic using the Tunnel	15393	1738	8249	1355	46,679
[I]	Proportion of Tunnel traffic that is Port-related = [G]/[H]	16%	67%	83%	10%	54%
[J]	Non-Port-related Tunnel traffic = [H] - [G]	12857	580	1409	1214	21,689

7.4.4 Projected Traffic growth rates

According to the Masterplan Review, Port throughput is projected to grow by an average of 3.3% per annum between 2017 and the horizon year of 2040.

As a simple working assumption, Port-related road traffic is forecast to grow in line with this growth in throughput.

For the non-Port-related traffic, projected per-annum traffic growth over time is taken from the county Dublin forecasts in TII Project Appraisal Guidance, unit 5.3 (Central scenario), as shown in the extract below in Figure 7.12.

Figure 7.12 – Dublin forecasts in TII Project Appraisal Guidance, unit 5.3 (Central scenario)

Central Growth			
2013 - 2030		2030 - 2050	
LV	HV	LV	HV
1.0134	1.0237	1.0038	1.0176

Applying these growth rates, a future year scenario was generated, as shown in Table 7.7.

Table 7.7 – Calculation – Future Year Traffic Using the Port Tunnel

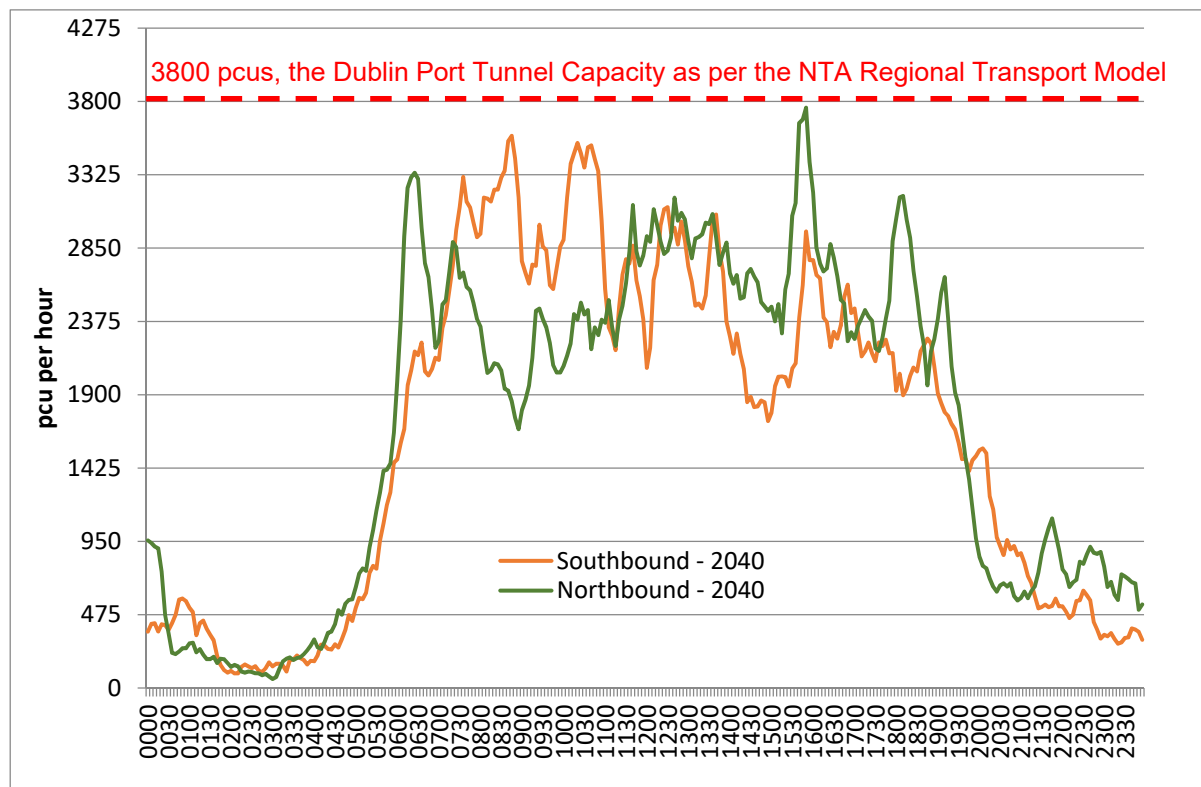
Typical weekday traffic		Light vehicles	OGV 1	OGV 2	Buses & coaches	pcu
[K]	2040 Port-related traffic using the Tunnel = $[G] \times 1.033^{23}$	5350	2443	1443	296	52,733
[L]	TII PAG growth for non-Port traffic	1.235	1.614	1.614	1.614	
[M]	2040 non-Port-related traffic using the Tunnel = $[L] \times [J]$	15877	936	2275	1960	30,135
[N]	2040 total Tunnel traffic = $[K] + [M]$	21228	3380	1670	2256	82,868
[O]	Growth relative to 2017 = $\frac{[N]}{[H]} - 1$	38%	94%	103%	67%	77.5%

This overall growth rate of 77.5% was then applied to the observed weekday profile of traffic through the Tunnel.

7.4.5 Resulting forecasts of Port Tunnel traffic

The results, comparing the predicted traffic flows for the Port Tunnel with the tunnel capacity as coded within the NTA Regional Transport Model, are shown in the Figure 7.13 below.

Figure 7.13 – Projected Future Flows – Dublin Port Tunnel 2040



The results show that, if projected levels of traffic growth occur uniformly across the day, then demand for travel through the Tunnel will remain within the nominal capacity of 3800 pcu per hour.

In practice, the impact of capacity restrictions elsewhere on the road network will tend to act so as to smooth out the profile of demand a little.

7.5 CONCLUSION OF DUBLIN PORT TUNNEL ANALYSIS

The preliminary traffic analysis undertaken is sufficient to demonstrate that neither the Port Tunnel nor the Toll Plaza is likely to form a constraint on the projected rate of growth of Port-related traffic.

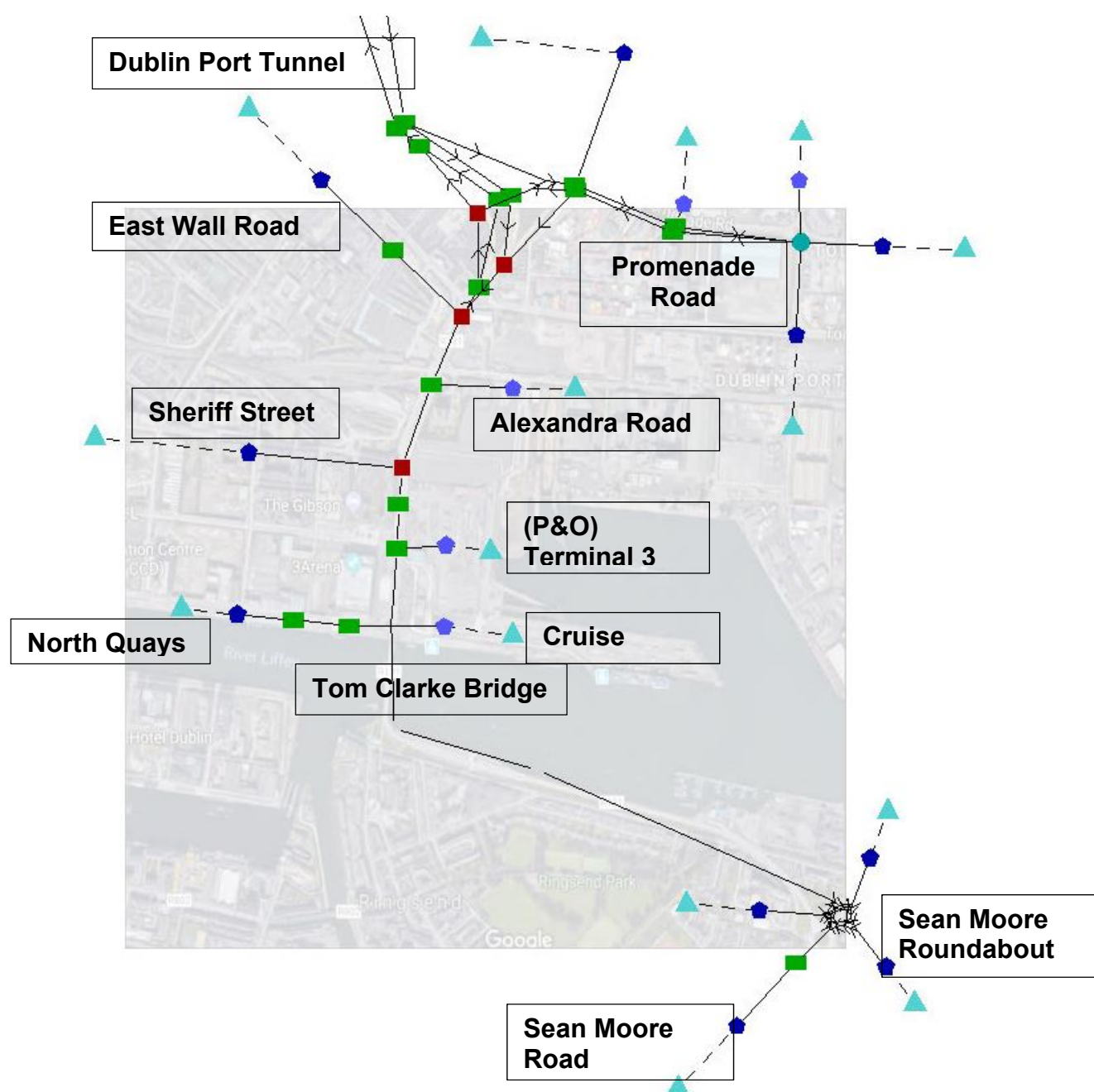
8. SIMPLE MODELLING APPROACH

The next stage of the Study involved traffic modelling.

8.1 MODEL EXTENT

The model was built using the SATURN software. The extent of the network is shown in Figure 8.1. The network was built from a cordon taken from the NTA Regional Transport Model, enhanced as needed to reflect the traffic movements of interest.

Figure 8.1 – Base Year Network

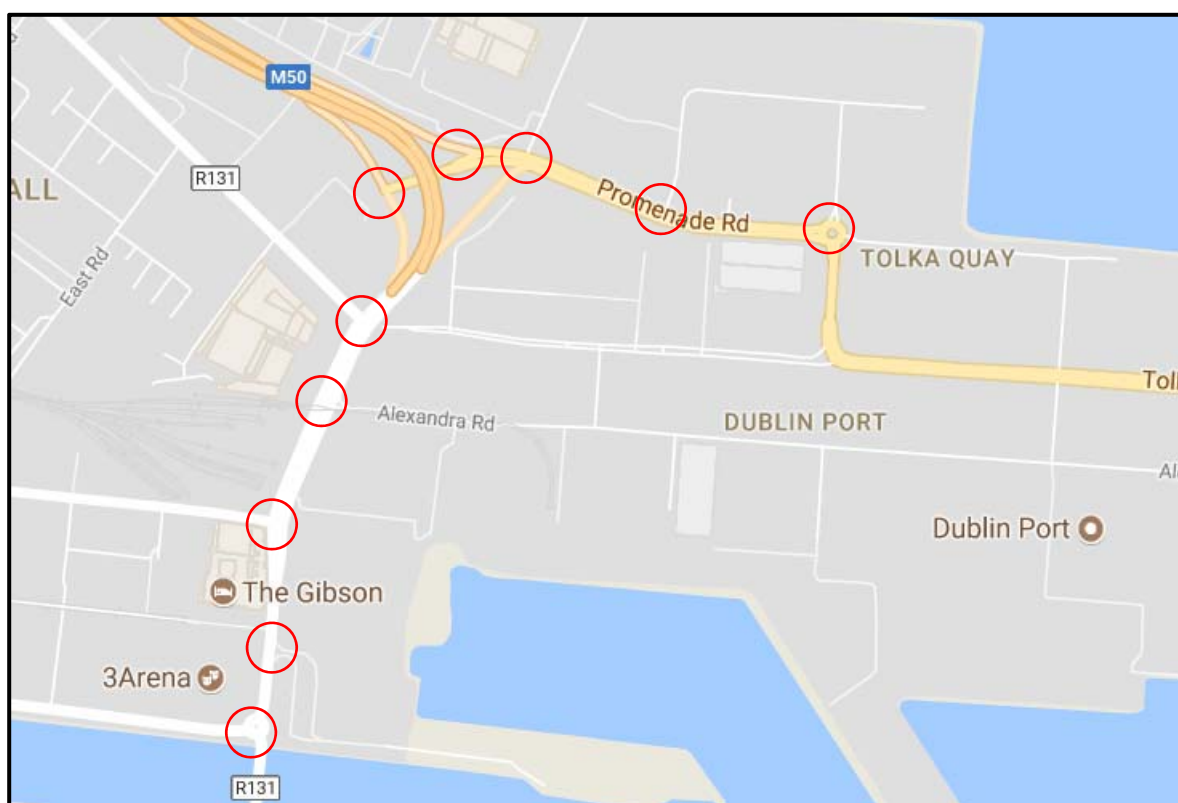


8.2 TRAFFIC DATA USED

The traffic count data used to build the model comprised:

- 24-hour weekday classified video turning counts, taken in May 2014, at ten junctions as shown in Figure 8.2;
- 24-hour weekday classified video turning counts, taken in July 2016, at the entrance to the MTL container operation on the Southern Lands;
- One-week pneumatic tube counts, taken in July 2016, on each arm of the Sean Moore Roundabout;
- 24-hour weekday classified video counts, taken in November 2017, at the toll plazas for the Dublin Port Tunnel and the Tom Clarke Bridge;
- Link counts from a permanent induction loop counter on Promenade Road.

Figure 8.2 – Location of 2014 junction counts



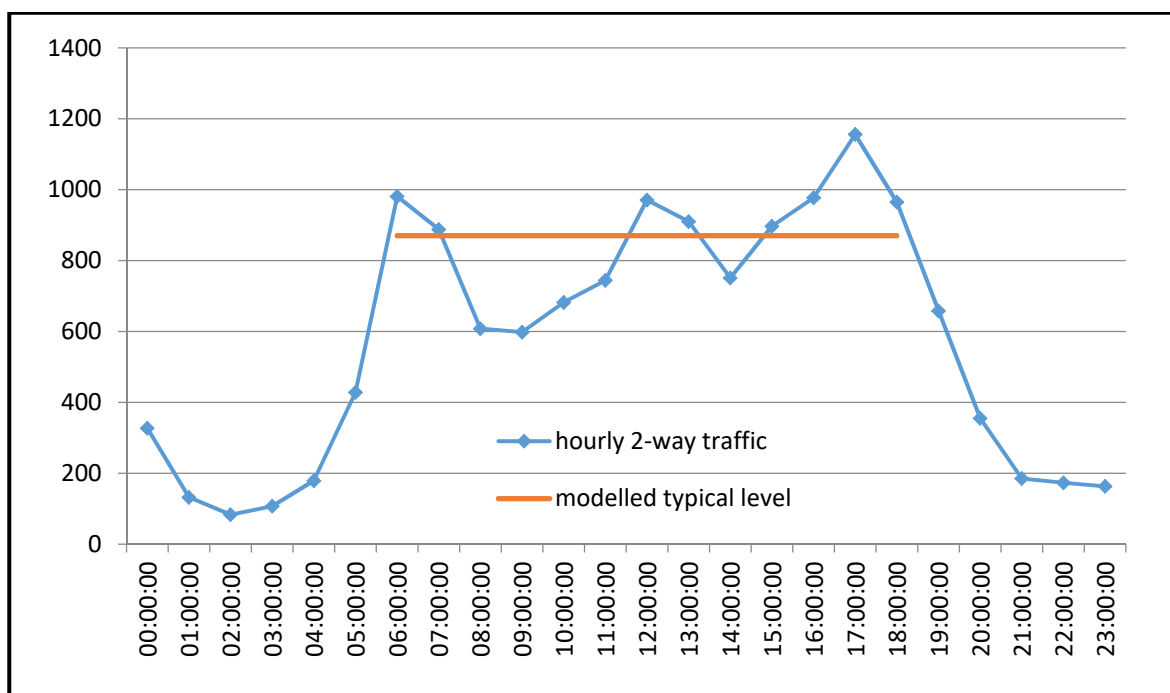
These counts are sufficient to establish the level of traffic flow on each link of the modelled road network.

8.3 ASSIGNMENT PROCESS

The model distinguishes 4 vehicle categories – cars, light goods vehicles, and two classes of heavy goods vehicles (OGV1 and OGV2, a standard classification where all articulated lorries and the heaviest of the rigid-bodied lorries fall into the OGV2 category).

For the purpose of allocating traffic flows to routes through the network, the model assigns to the network a level of traffic equal to 6.15% (approximately one-sixteenth) of the daily total. This represents the average traffic flow level over the hours 6am to 7pm, based on daily profile data from the permanent counter on Promenade Road, as detailed in Figure 8.3.

Figure 8.3 – Daily Traffic Profile



The generalised costs used for each vehicle type are those used in the NTA model. As explained above, the pcu factors used for calculation of journey times are 1.0 for cars and LGVs, 1.9 for OGV1s and 2.9 for OGV2s. These values are consistent with those used in the NTA model. Buses and coaches were coded as OGV2s¹.

Note that there is minimal route choice in the base year network, so the model development is not sensitive to these assumptions.

¹ In the NTA model, these vehicle types are represented as scheduled buses on fixed routes, and are given a pcu factor of 3.0.

8.4 TRIP MATRIX DEVELOPMENT

The 2014 counts were coded into the model. The 2016 counts were factored back to 2014 using time series data from the permanent counter on Promenade Road.

An initial trip matrix was taken from a cordon out of the NTA model. Traffic to/from the Port zones in the cordon model was disaggregated to the larger number of Port zones in the local model. The Waste-to-Energy site was under construction at the time of the 2016 surveys, and traffic to/from the construction compound for the Waste-to-Energy site was excluded.

All zero cells were seeded with a notional value of 0.5.

The SATURN matrix estimation procedure was used to derive a trip matrix (split by vehicle class) that best fits the traffic count data.

Assigning this matrix to the base year network gives estimated 2014 daily flows as shown in Figure 8.4.

In the second step, the 2014 matrix was factored up to 2017 levels. This matrix was growthed from 2014 to 2017 traffic levels, using:

- an observed growth rate (from the Promenade Rd counter) of 14.9%, applied to all movements to and from Port zones (including the east arm of the Sean Moore Roundabout which is in practice a mix of Port and non-Port traffic);
- TII published link-based growth rates (4.1% lights and 7.3% heavies) for all other movements.

The matrix estimation procedure was then run again to fit this growthed matrix to the 2017 count data.

Resulting estimates of 2017 daily flows as shown in Figure 8.5.

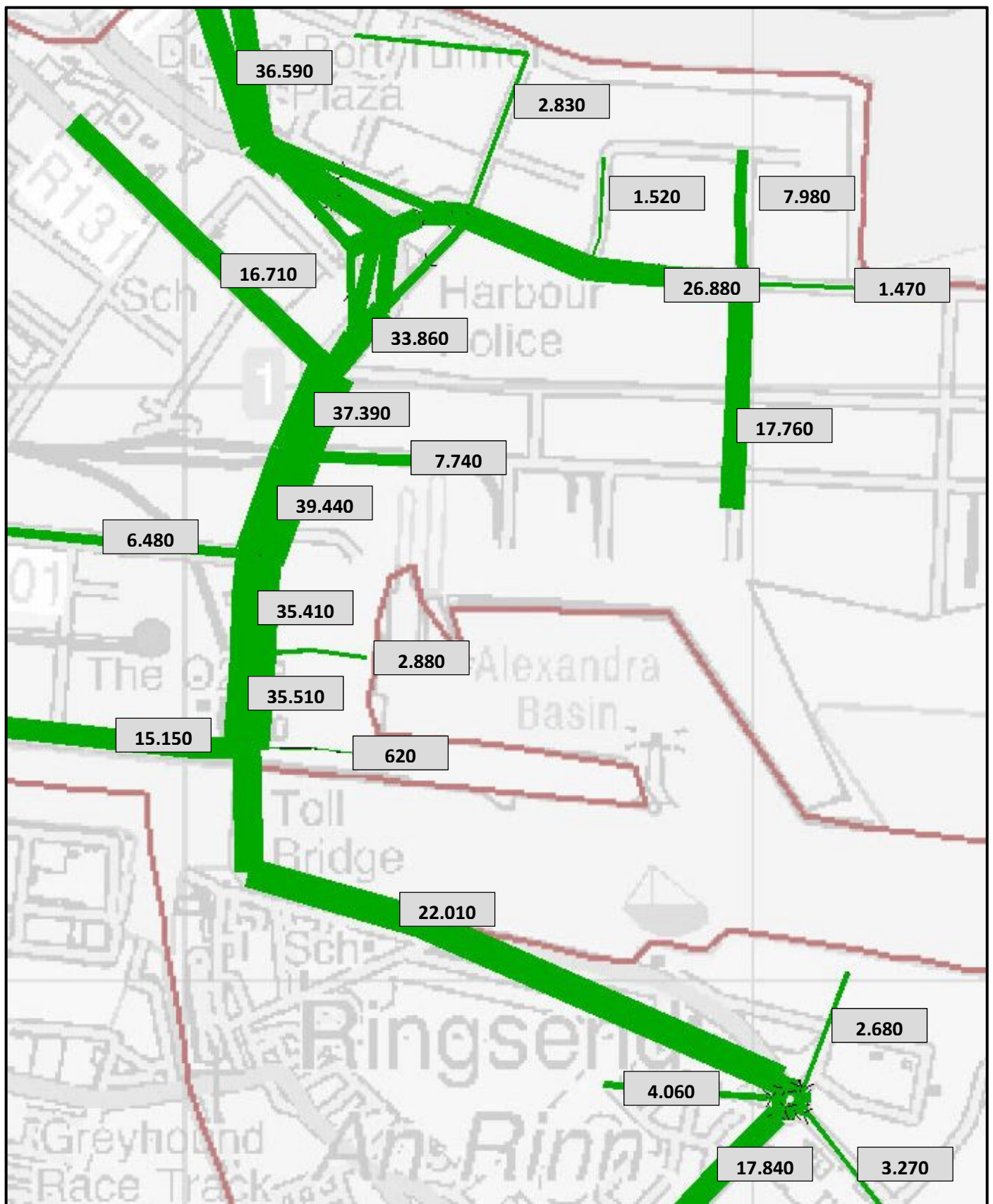
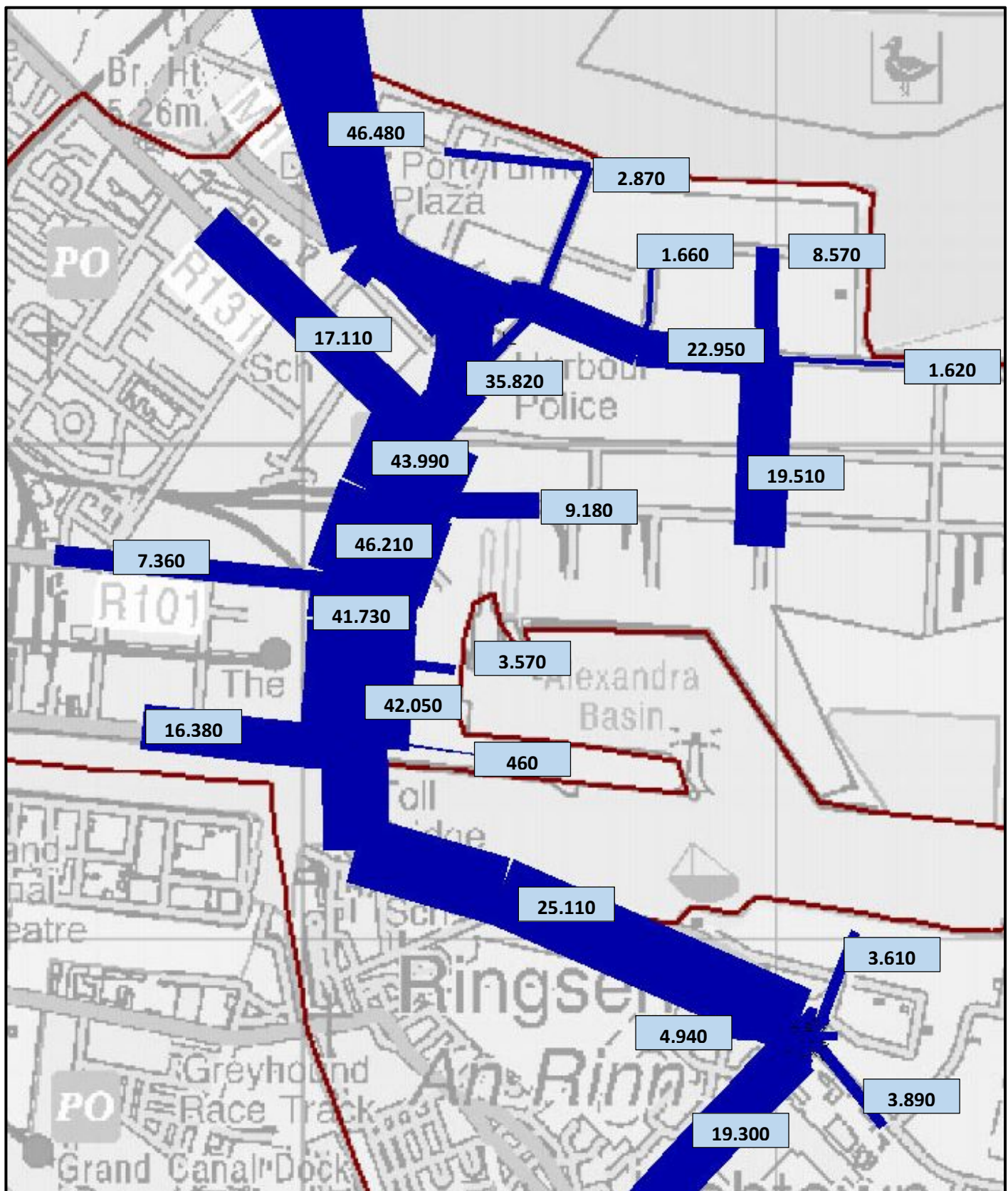
Figure 8.4 – Modelled Traffic Flows (2014, pcu per day two-way)

Figure 8.5 – Modelled Traffic Flows (2017, pcu per day two-way)



8.5 FUTURE TRAFFIC LEVELS

Three future year trip matrices were derived for the forecast year of 2040, by applying growth factors to the fitted 2017 matrix:

- For the Option 1 matrix, a projected long-term growth rate of 2.5% per year was applied to all movements to and from Port zones. This represents the AAGR for Dublin Port in the original Masterplan 2012-2040. There is no SPAR in this option as it relates to the 2012 Masterplan;
- For the Option 2 matrix, a projected long-term growth rate of 3.3% per year was applied to all movements to and from Port zones. This represents the revised AAGR contained in the Masterplan Review carried out in 2018. For assessment purposes the SPAR is not included in this option;
- For the Option 3 matrix, a projected long-term growth rate of 3.3% per year was applied to all movements to and from Port zones, and the SPAR was included in this option.

In all cases, no growth was applied to movements between city centre zones (Ringsend, North Quays, Upper Sheriff Street and East Wall Rd).

TII published link-based growth rates for the Dublin region (23.5% lights and 61.4% heavies) were applied to all other movements. These comprise the “through traffic” between the Port Tunnel and Sean Moore Road, and the traffic between these two zones and the city centre zones.

8.6 FUTURE YEAR NETWORKS

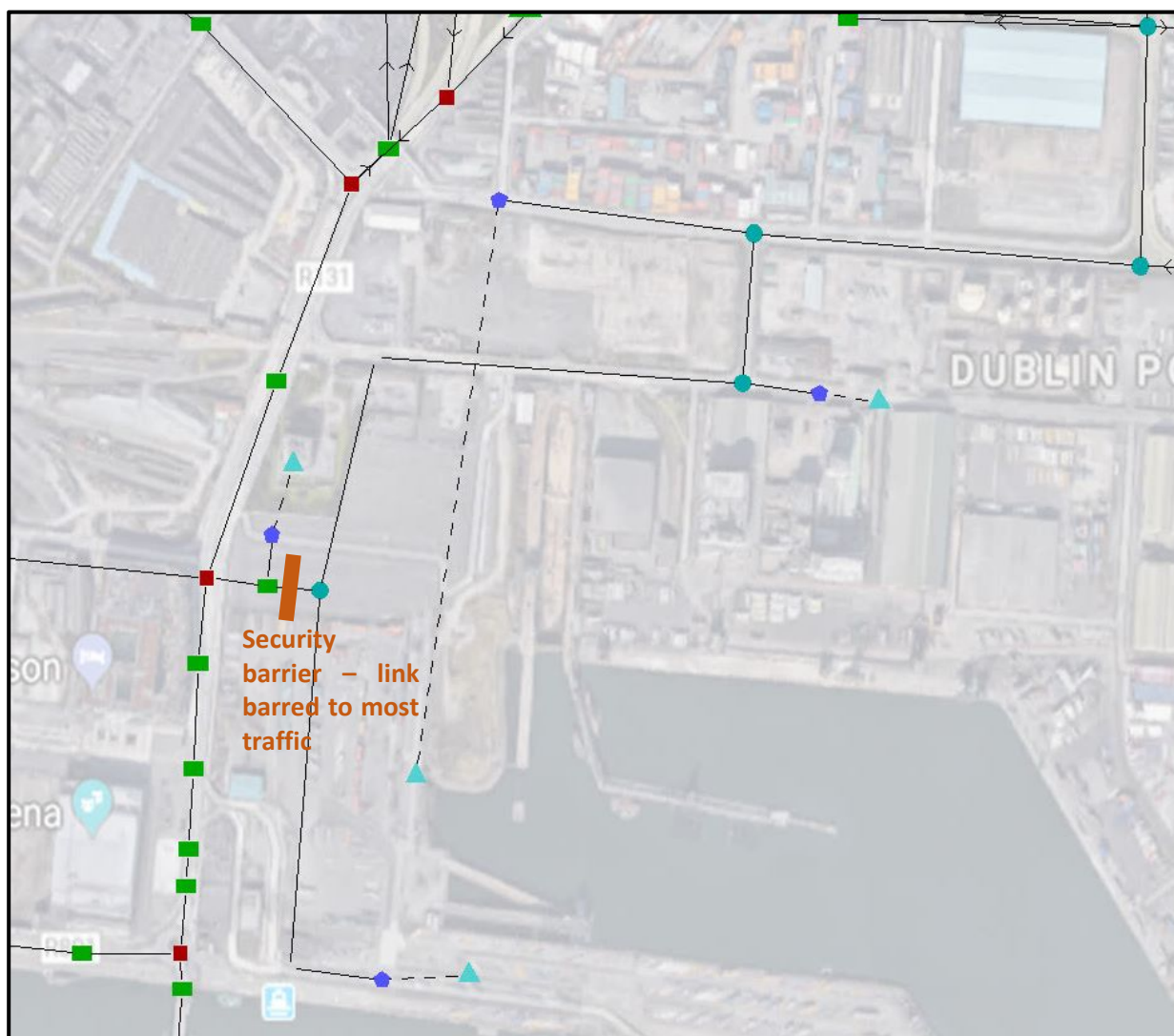
Two future year networks were used, one with the proposed new SPAR bridge over the Liffey, and one without, so as to assess the likely scale of traffic impact of this scheme.

Both networks include the proposals to reduce the number of Port accesses. This scheme would close the existing three accesses along East Wall Road – the access from the Cruise Terminal onto the Point Roundabout, the access from the P&O terminal, and the access from Alexandra Road. This was agreed as part of the planning process for the DPC ABR Project.

A DCC scheme would create a new access forming a fourth arm to the junction with Upper Sheriff Street, but the intention of the Port is that this would be used only for buses and for access to the car park at the Port Centre building, and not for general Port traffic. The scheme would also replace the existing Point Roundabout junction with traffic signals.

The modelling assumptions for the without-SPAR network are as follows, and indicated in Figure 8.6 :

- Light traffic to/from the Cruise Terminal would use the SPAR northbound to access Alexandra Road and from there use the improved internal Port road network to the main Port entrance on Promenade Road. Coaches associated with the Cruise Terminal are permitted to use the new access at Upper Sheriff Street.
- Traffic to/from the existing Terminal 3 (where P&O currently occupy) would use a proposed new bridge over Alexandra Road to access the improved internal Port road network at Tolka Quay Road, and from there to the main Port entrance on Promenade Road.
- Future traffic that in a Do-Nothing situation would use the Alexandra Road access has been split between two zones of the future year model. 11% of the cars have been allocated to a zone representing the Port Centre building that can use either the proposed Upper Sheriff Street access or the proposed SPAR northbound. The remainder continues to join the network at Alexandra Road, and from there to the main Port entrance on Promenade Road.

Figure 8.6 – Modelled Without-SPAR Network

Additional modelling assumptions for the with-SPAR network are as follows:

- Non-Port traffic (movements between two non-Port zones) is barred from using any of the three Port accesses, so as to prevent “rat-running” through the Port.
- Car traffic to and from the ferry terminal is assumed to follow a system of road signs, directing it to use the Promenade Road access for destinations north of the Liffey and the SPAR and the Sean Moore Roundabout access for destinations south of the Liffey.
- Other Port-related traffic is assumed to choose between the two accesses on the basis of the shortest/quickest route.

8.7 FUTURE YEAR MODEL RESULTS

Figures 8.7 to 8.9 show forecast traffic flows for the three scenarios of interest for the year 2040:

- Figure 8.7 - Option 1: 2.5% AAGR levels of Port traffic, no SPAR;
- Figure 8.8 - Option 2: 3.3% AAGR levels of Port traffic, no SPAR;
- Figure 8.9 - Option 3: 3.3% AAGR levels of Port traffic, with SPAR.

8.7.1 Traffic Flows on the SPAR at the River Liffey Crossing

The traffic on the SPAR is roughly equally comprised of:

- Port-related traffic travelling between the Southern Lands and the Promenade Road access to the Port;
- Port-related traffic between the Northern Lands and the Sean Moore Roundabout access to the Port;

Figure 8.9 (Option 3) shows that the SPAR is predicted to carry around 12,900 pcus each working day in the design year of 2040 at the section that crosses the Liffey.

8.7.2 Reduction of Traffic Flows on the Tom Clarke Bridge

The 12,900 pcu each working day predicted on the SPAR at the section that crosses the Liffey in the design year of 2040 relieves the Tom Clarke Bridge of approximately one-third of its traffic.

Comparing Figure 8.8 (Option 2) with the flows in Figure 8.9 shows that with the 3.3% AAGR without the SPAR, the Tom Clarke Bridge would have had to accommodate 37,200 pcus per day. The provision of the SPAR reduces the flows on the Tom Clarke Bridge by about a third to 24,290 pcus per day.

Figure 8.7 (Option 1) shows that for the 2012 Masterplan with an AAGR of 2.5%, the flows on the Tom Clarke Bridge would have been 34,880, which is 10,590 pcus higher than the Option 3 flows of 24,290.

The results therefore show that not only does the SPAR significantly mitigate the impact of the 3.3% AAGR on the Tom Clarke Bridge, but also provides mitigation for the impact 2.5% AAGR already engrained in the 2012 Masterplan.

8.7.3 Reduction of Traffic Flows on the East Wall Road

Table 8.1 summarises the results of the traffic volumes (two-way, pcu, daily) for the 3 Options being assessed on the East Wall Road compared to the current traffic flows in 2017.

Table 8.1 – Forecast Traffic Levels on East Wall Road (Two-way, pcu, daily)

Route	Forecast Traffic levels on East Wall Road (Two-way, pcu, daily)			
	Current (2017)	Option 1 2.5% AAGR No SPAR (2040)	Option 2 3.3% AAGR No SPAR (2040)	Option 3 3.3 AAGR With SPAR (2040)
North of Upper Sheriff Street	45,095	61,810	66,620	54,470
	<i>change</i>	+37%	+48%	21%
South of Upper Sheriff Street	41,890	55,520	59,860	47,110
	<i>change</i>	+33%	+43%	12%
Average	43,493	58,665	63,240	50,790
	<i>change</i>	+35%	+45%	17%

Under Option 1, which assesses the original Masterplan scenario of 2.5% AAGR with no SPAR, the East Wall Road (between The Point and Tolka Quay Road) is forecast to experience traffic demand broadly 35% higher than current (2017) levels. The traffic flows increase from 43,493 pcus to 58,665 pcus.

Option 2, which assesses the revised growth scenario of 3.3% AAGR without the SPAR, shows that traffic flows on this road increase to around 45% higher than current levels, increasing to 63,240 pcus per day.

However under Option 3, with the SPAR in place for the 3.3% AAGR, traffic levels on this section of East Wall Road fall to around just 17% above current levels to 50,790 pcus - less than Option 1 of 58,665 pcus.

These results show that traffic flows on the East Wall Road are less for Option 3 (3.3% AAGR with SPAR), than for Options 1 (2.5% AAGR without SPAR) or 2 (3.3% AAGR without SPAR).

Again, these results show that not only does the SPAR significantly mitigate the impact of the 3.3% AAGR on the East Wall Road, but also provides mitigation for the impact 2.5% AAGR already engrained in the 2012 Masterplan, providing a 13% reduction in traffic flows compared to the no-SPAR base scenario.

8.7.4 Reduction of Typical Journey times for through traffic between Sean Moore Road and the Dublin Port Tunnel.

Table 8.2 shows the typical modelled journey times for through traffic between Sean Moore Road and the Dublin Port Tunnel for Options 1 to 3 compared to the current journey times in 2017.

Table 8.2 – Typical Modelled Journey Times for Through Traffic between Sean Moore Road and the Dublin Port Tunnel

Through traffic between Sean Moore Road and the Dublin Port Tunnel	Typical Journey Time (Seconds)			
	Current Journey Time (2017)	Option 1 2.5% AAGR <u>No</u> SPAR (2040)	Option 2 3.3% AAGR <u>No</u> SPAR (2040)	Option 3 3.3% AAGR <u>With</u> SPAR (2040)
Northbound	523	781	924	583
	<i>change</i>	<i>49%</i>	<i>77%</i>	<i>11%</i>
Southbound	515	567	589	545
	<i>change</i>	<i>10%</i>	<i>14%</i>	<i>6%</i>

The results in Table 8.2 above shows that typically it currently (2017) takes 523 seconds to travel from Sean Moore Roundabout to the Tunnel, and 515 seconds to travel from the Tunnel to the Sean Moore Roundabout.

For Option 1, which assesses the original Masterplan scenario of 2.5% AAGR with no SPAR in 2040, the journey times increase to 781 seconds northbound and 567 seconds southbound.

When Option 2 is considered, which is 3.3% pa AAGR and no SPAR, the journey times increase to 914 seconds for the northbound journey and 589 seconds for the southbound journey.

However, when Option 3 is considered, which is 3.3% pa with the SPAR, the typical journey times are reduced to a level even below Option 1 (the original Masterplan growth expectations). In Option 3 it takes on average 583 seconds to travel from Sean Moore Roundabout to the Tunnel, and 545 seconds to travel from the Tunnel to the Sean Moore Roundabout.

Once again, these results show that not only does the SPAR significantly mitigate the impact of the 3.3% AAGR on the road corridor between the Dublin Port Tunnel and the Sean Moore Roundabout, but also provides mitigation for the impact 2.5% AAGR already engrained in the 2012 Masterplan. Typical journey times are reduced by 25% northbound and 4% southbound compared to the no-SPAR based scenario.

8.7.5 Summary of Simple Modelling Approach Results

In summary, the results show that not only will the SPAR significantly mitigate the impact of the additional growth due to the 3.3% AAGR on the road corridor between the Dublin Port Tunnel and the Sean Moore Roundabout up to the year 2040, but even provides mitigation for the impact of the 2.5% AAGR already engrained in the 2012 Masterplan.

Traffic Flows on the SPAR

- Option 3 results shows that the SPAR is predicted to carry around 12,900 pcus each working day in the design year of 2040 at the section that crosses the Liffey, a level for which a single-carriageway road is appropriate.

Reduction of Traffic Flows on the Tom Clarke Bridge

- Results show that the 12,900 pcus per day predicted on the SPAR in the design year of 2040 relieves the Tom Clarke Bridge of approximately one-third of its traffic, from 34,880 pcus per day in Option 1 and 37,200 pcus per day for Option 2, reducing to 24,290 pcus per day in Option 3. Therefore Option 3 has 10,590 pcus per day less than Option 1.

Reduction of Traffic Flows on the East Wall Road

- Traffic flows on the East Wall Road are Option 1 (58,665 pcus per day) and Option 2 (63,240 pcus per day).
- The results show that with the introduction of the SPAR (Option 3) traffic on the East Wall Road reduces to 50,790 pcus per day, less than for Option 1 and Option 2.
- This represents a 14% reduction in the traffic flows on East Wall Road compared to the no-SPAR base scenario.

Reduction of Typical Journey times for through traffic between Sean Moore Road and the Dublin Port Tunnel.

- The results show that it typically it currently takes 523 seconds to travel northbound from Sean Moore Roundabout to the Tunnel. This will increase to 781 seconds for Option 1 and 924 seconds for Option 2 for the design year 2040. However, the introduction of the SPAR in Option 3 reduces the travel time back to 583 seconds, less than the Option 1 results.
- Similarly, the results show that it typically it currently takes 515 seconds to travel southbound from the Tunnel to Sean Moore Roundabout. This will increase to 567 seconds for Option 1 and 589 seconds for Option 2. However, the introduction of the SPAR in Option 3 reduces the travel time back to 545 seconds, less than the Option 1 results.
- Hence, typical journey times are reduced by 25% northbound and 4% southbound compared to the no-SPAR based scenario.

Figure 8.7 – Modelled Traffic Flows (2040 Option 1, pcu per day two-way) i.e. 2.5% AAGR with no SPAR

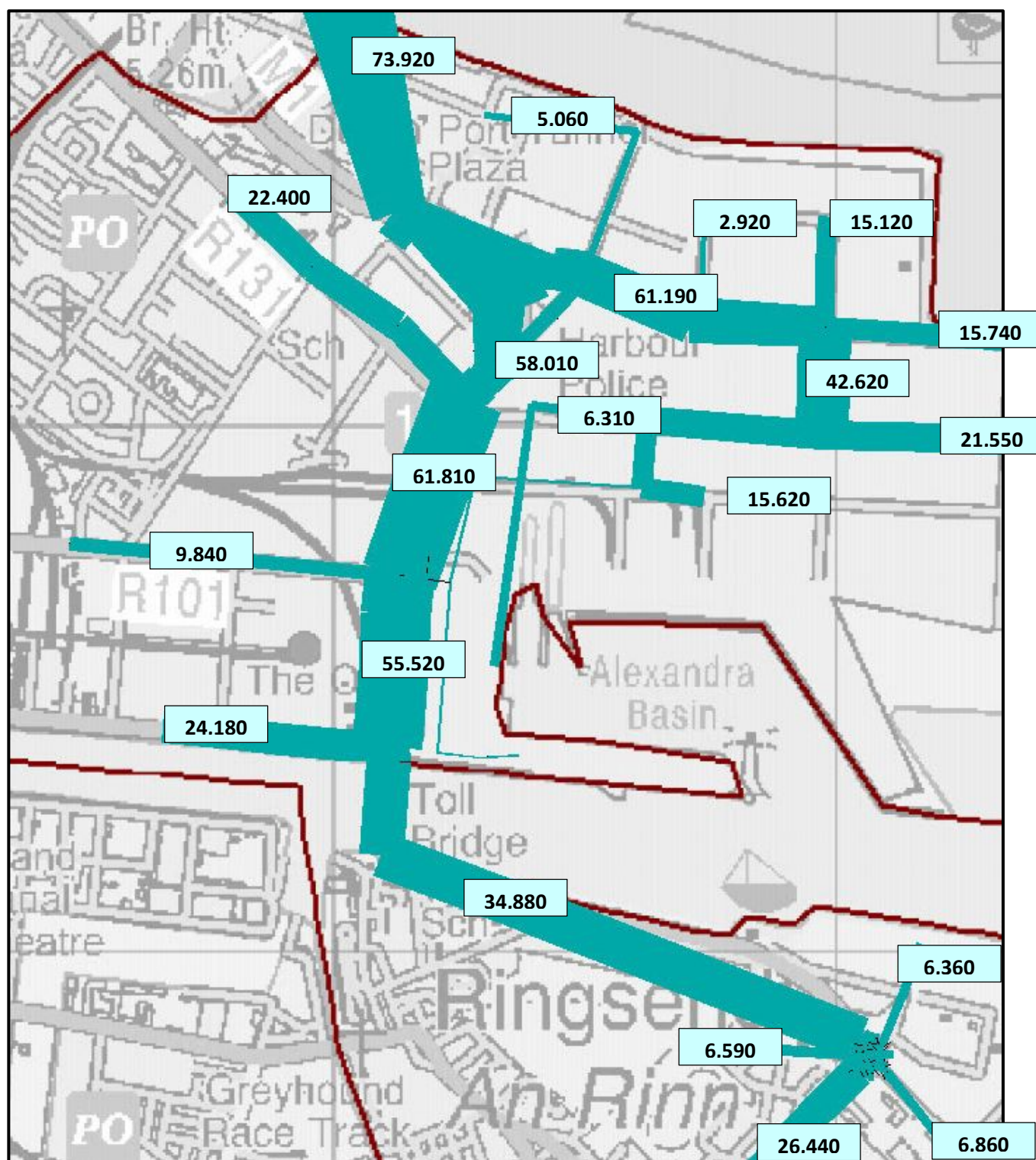


Figure 8.8 – Modelled Traffic Flows (2040 Option 2, pcu per day two-way) i.e. 3.3% AAGR with no SPAR

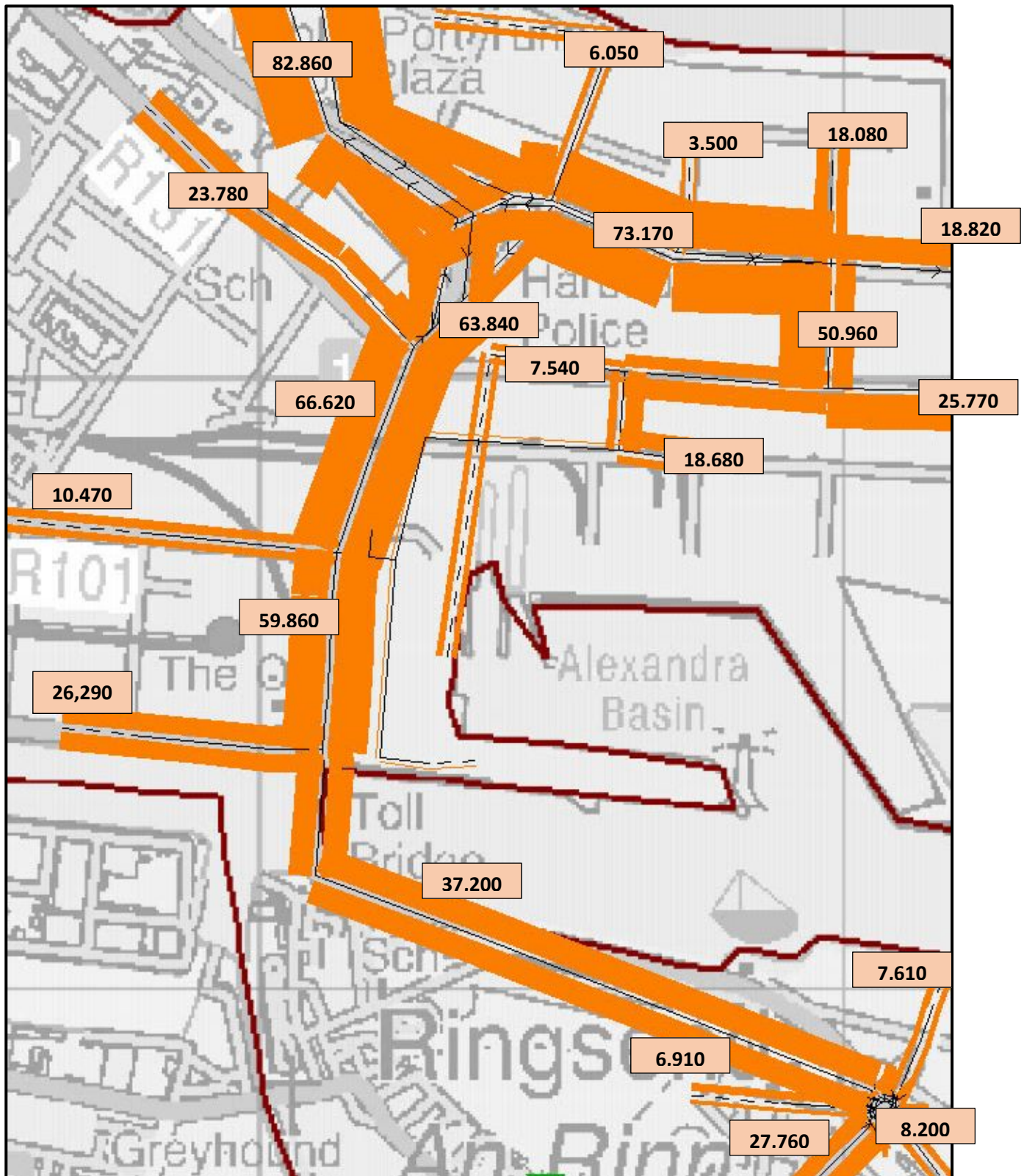
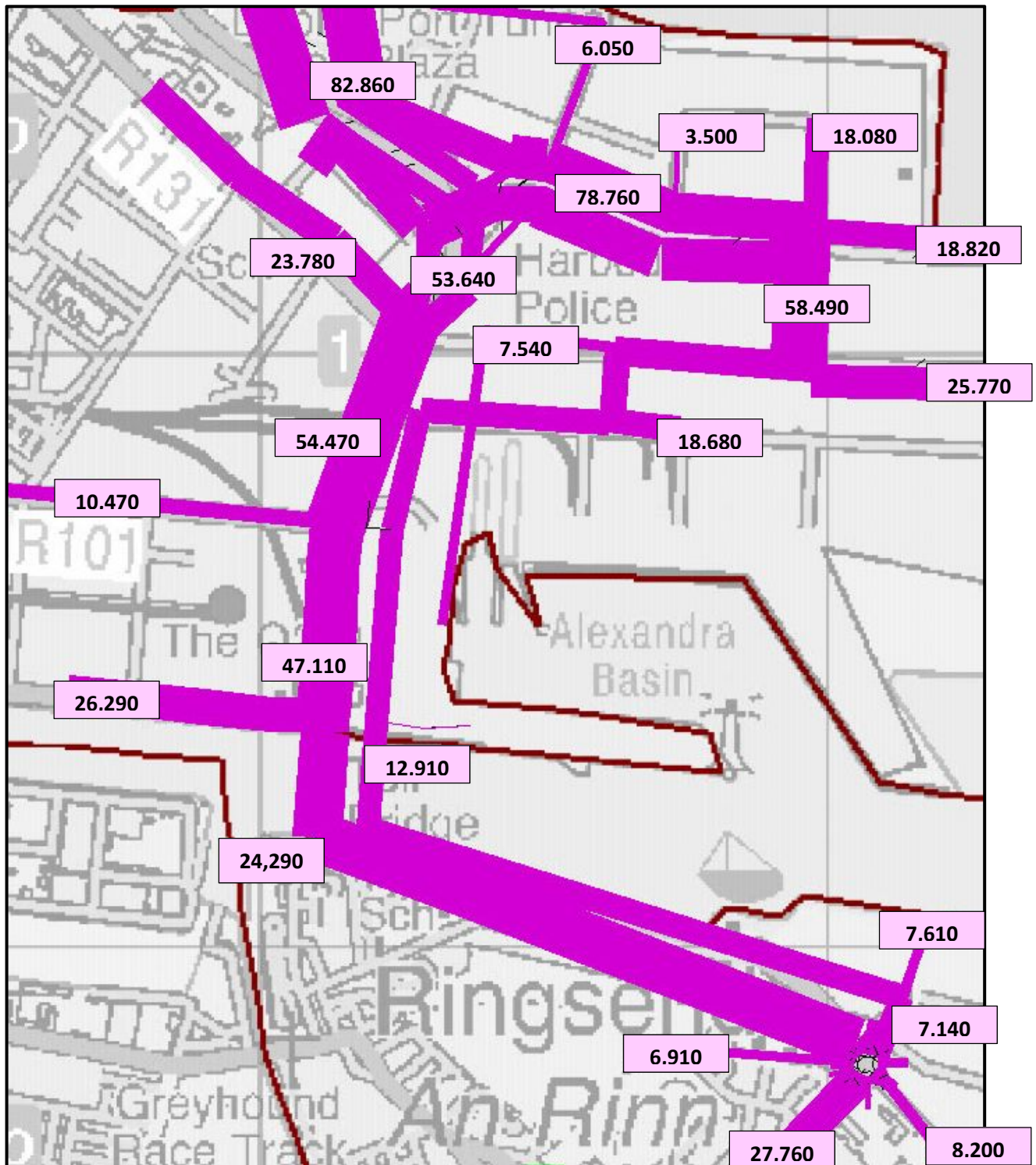


Figure 8.9 – Modelled Traffic Flows (2040 Option 2 with SPAR, pcu per day two-way) i.e. 3.3% AAGR with the SPAR



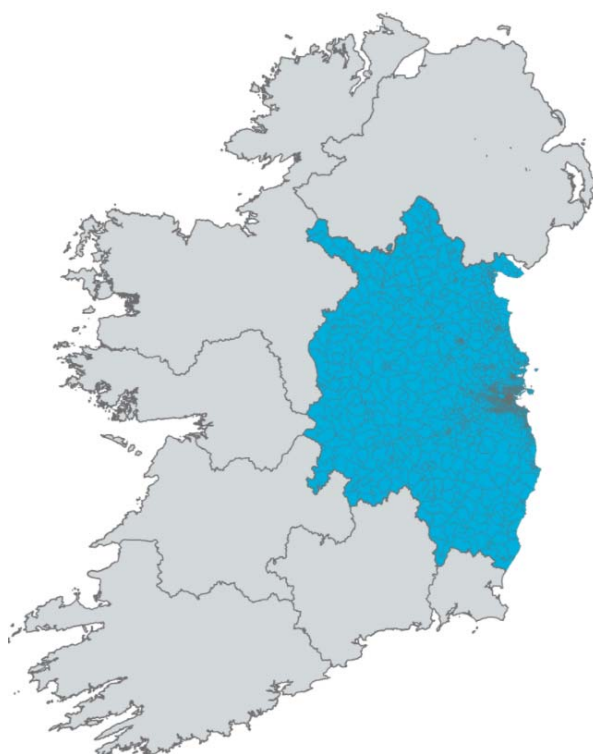
9. USE OF NTA MULTI-MODAL MODEL

9.1 FULL MODEL RUN

The NTA maintain a set of regional strategic multi-modal transport models. The Eastern Regional Model is the largest of these, covering not only Dublin but also the eastern counties in the State that could be considered Dublin's hinterland.

A run of this model was undertaken, based on the NTA's existing representation of the Transport Strategy for the Greater Dublin Area 2016-2035.

RPS met with and liaised with NTA on an-going basis between October 2018 and March 2018 in relation to the run of their strategic multi-modal model.



The advantages of using this model include:

- It takes account of proposed land-use changes across the region;
- It includes the public transport measures proposed as part of the Strategy;
- It represents demand responses to changes in the cost of transport – mode-switching and destination-switching as well as wide-area reassignment;
- It delivers forecast traffic flows for AM peak and interpeak and PM peak and interpeak hours, representing different levels of congestion across the working day;
- It is a well-accepted model that has been the subject of considerable checking and validation by NTA.

The disadvantages of the model are:

- The grouping of trip origins and destinations into zones is usually coarser than is ideal for a local model
- The model's size and complexity mean that it takes days to run (on a special high-powered computer system) and some types of changes to the inputs and assumptions are not straightforward to make.

Note that NTA regional model confirms that the Poolbeg West SDZ Planning Scheme will be a sustainable transport based scheme, indicating that a car-based residential scheme will not work in that location.

9.2 CHANGES FROM THE NTA'S STANDARD MODEL INPUTS

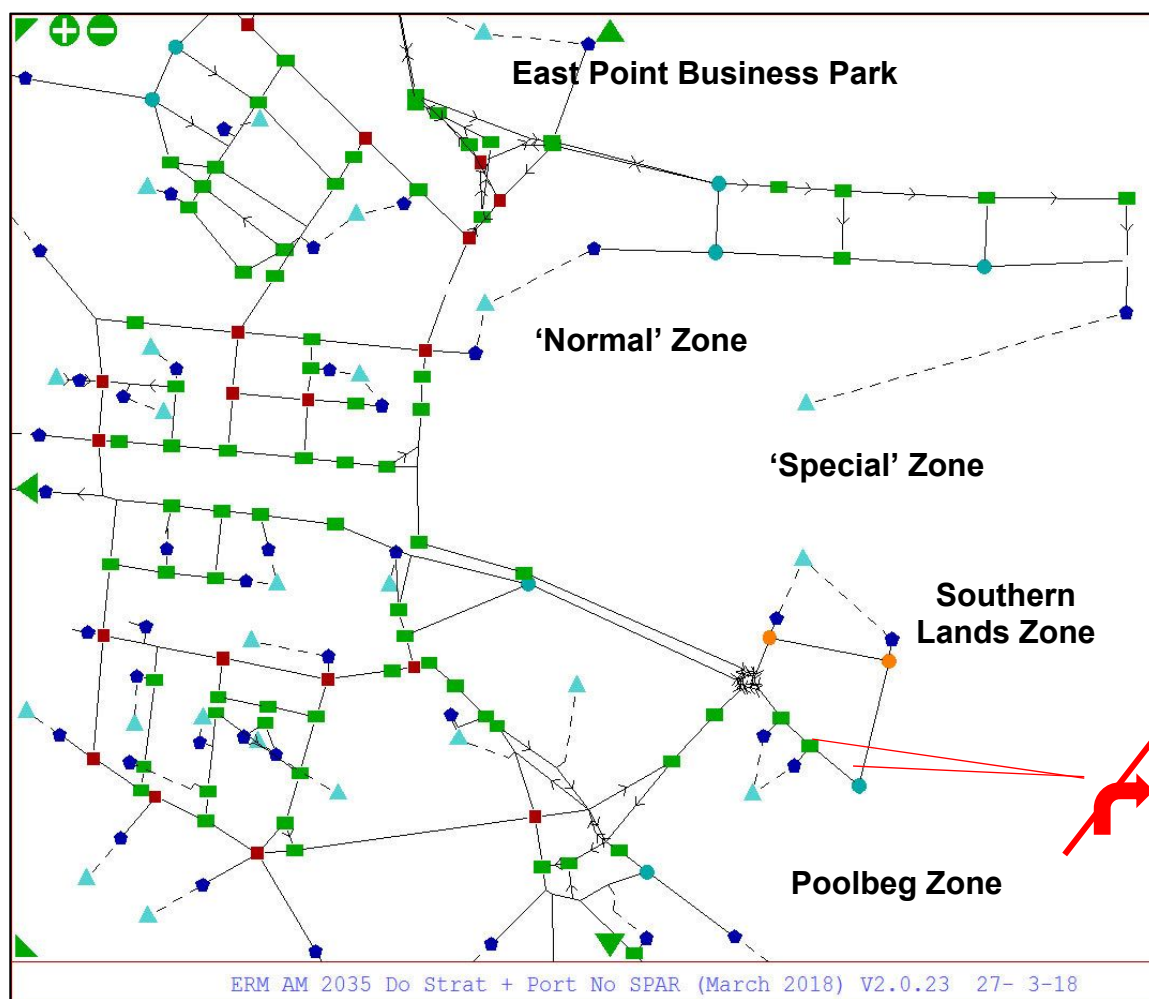
The model run undertaken was for a 2035 future year. The changes from the NTA's standard Do-Strategy model inputs were as follows:

Trip Matrix Changes

- A redundant zone of the model was re-used as a South Docks zone, and given traffic equal to observed levels growthed up by 3.3% per annum to 2035;
- Of the two model zones representing the North Docks, one (the “normal” zone) retained its existing travel demand based on population and employment projections; the demand from the other (the “special” zone) was overwritten so that the sum of the two was equal to observed levels growthed up by 3.3% per annum to 2035;
- Refer to Figure 9.1 below.

Highway Network Changes

- The Dublin Eastern Bypass scheme was removed from the network;
- The proposed bus-only new River Dodder Bridge was added into the network;
- The proposed DCC scheme to replace the Point Roundabout with traffic signals was assumed to be in place;
- The Alexandra Road access from the Port to East Wall Road was assumed to be closed and replaced by a fourth arm on the junction at Upper Sheriff Street;
- Network coding in the local area was checked, and traffic signal settings adjusted to reflect near-optimum values based on early-iteration results from the model;
- Changes to the way that the Port zones connect to the road network were made, so that:
 - The “special” Port zone (not subject to mode-switching) was located at the ferry terminal;
 - The “normal” or employment-related Port zone (trips subject to mode-switching) was given two centroid connectors – a car-only connection to the Sheriff St access and an all-vehicle connection to the Port internal road network at Tolka Quay Road;
 - The South Docks zone was connected to both north-east and south-east arms of the Sean Moore Roundabout;
 - The Poolbeg zone was connected to the south-east arm only of the Sean Moore Roundabout.

Figure 9.1 – Representation of the Port in NTA Model Runs

This model run therefore represents a “future baseline” for 2035 in which the traffic growth from the Masterplan Review, regional planning policy, and the NTA policy of investment in public transport, are represented and fully responded to.

9.3 INTERPRETATION OF BASELINE 2035 RESULTS

The model results for the AM peak hour show:

- The Dublin Port Tunnel operating well within capacity;
- The Sean Moore Roundabout operating well within capacity;
- All the signalised junctions on East Wall Road between the Dublin Port Tunnel and the Tom Clarke Bridge experiencing over-capacity queuing, at a level that appears capable of being resolved by intelligent signal control;
- The junction of Guild Street with the Samuel Beckett Bridge to be over-capacity at a level that is not capable of being resolved by changes to junction operation;
- Significant flows of car traffic related to Port employment, particularly from the Clontarf area, entering the Port by the new Upper Sheriff Street access;
- Over-capacity queuing at the internal Promenade Road Roundabout (the coding of which has been left unchanged from the NTA-coded saturation flow of 2200 pcu/hour).

The model results for the PM peak hour show the local network generally operating within capacity, other than:

- The junction of Guild Street with the Samuel Beckett Bridge to be over-capacity at a level that is not capable of being resolved by changes to junction operation.

9.4 INITIAL TESTS OF PROPOSED SPAR

A local model cordon was extracted from this run of the full multi-modal regional model.

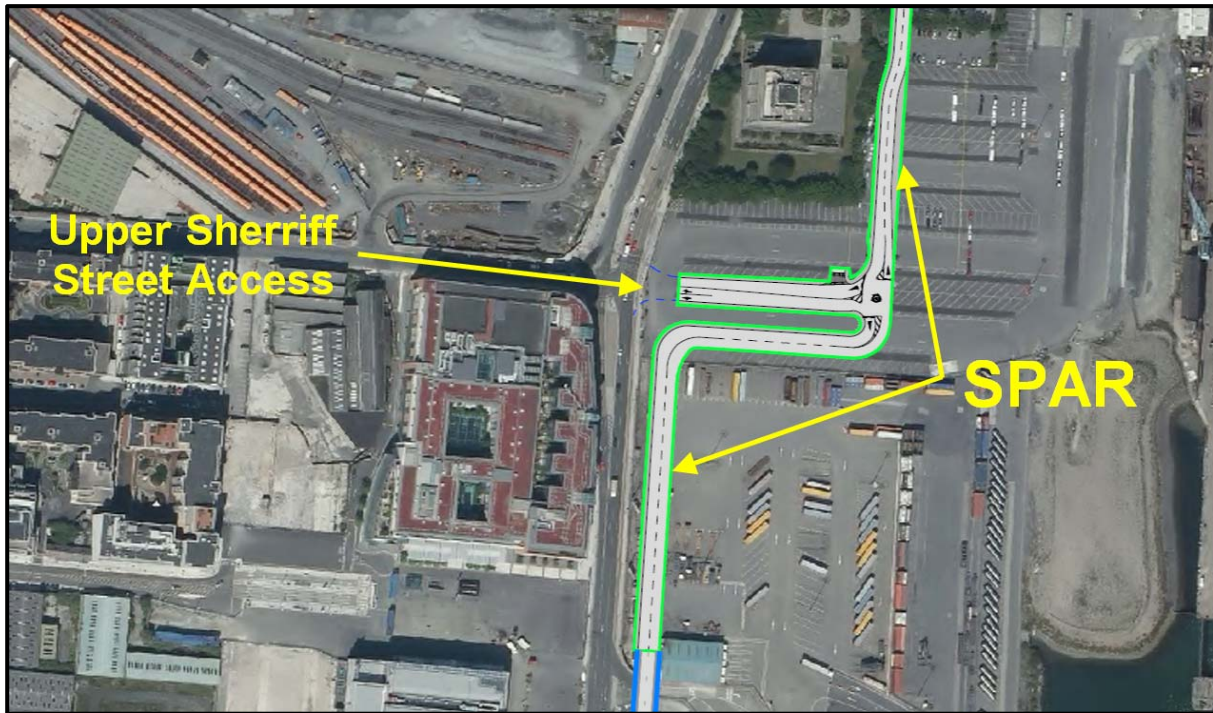
Simply coding the proposed SPAR into the model network shows that in the absence of some form of access control, almost all of the traffic using the Tom Clarke Bridge would divert to the SPAR to avoid the combination of traffic signals and the East Link toll. Hence traffic management measures will be important to stop the SPAR from becoming a rat run.

9.4.1 Traffic Management Requirements at Upper Sheriff Street Access

The Upper Sheriff Street Access, is part of a larger the DCC scheme to signalise the Point Roundabout and provide widening along East Wall Road. This is illustrated in Figure 2.4 above and in Appendix 1.

Figure 9.2 below indicates how the Upper Sheriff Street Port Access Connects to the SPAR for modelling purposes within this report.

Figure 9.2 – Upper Sheriff Street Port Access Connection to the SPAR for Modelling Purposes Within this Report



The current thinking is that the only traffic movements that will be permitted to use the Upper Sheriff Street Access to the Port are:

- Staff and users at the Port Centre building;
- Large vehicles associated with the cruise vessels;
- Public transport services permitted to use the SPAR to facilitate enhanced services. This has been estimated at about 10 buses movements per hour at peak times.

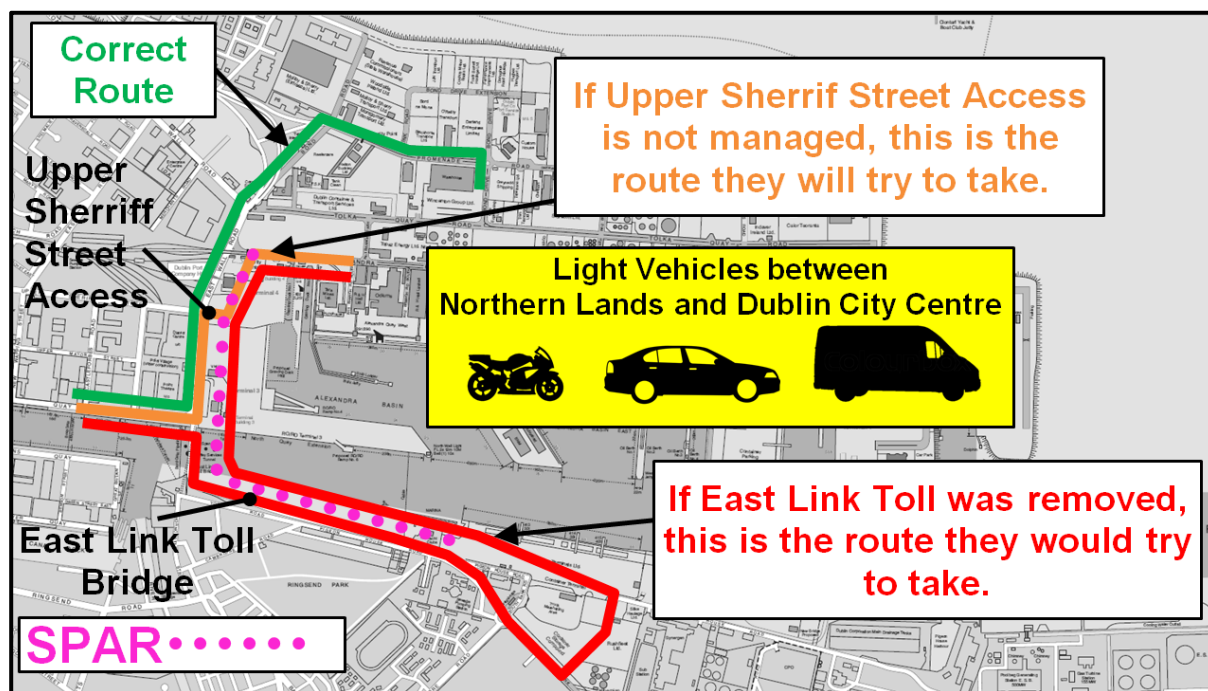
These constraints have been manually added to the traffic model network. Without these constraints in place the model would (1) assign much more non-Port traffic to the SPAR and (2) would allow Port traffic to access to the City Centre and avoid Promenade Road. This confirms what was already intuitive, that traffic management proposals will be essential at this access.

9.4.2 The Role of the East Link Toll Bridge in the Traffic Routing and Management of Port Related Light Vehicles between Northern Lands and Dublin City Centre

The traffic model network has revealed some considerations to take account of in the assignment of light vehicles between the Northern Lands at the Port and Dublin City Centre.

Figure 9.3 below has been prepared to illustrate this point.

Figure 9.3 – Routing Information for Port Related Light Vehicles Travelling Between Northern Lands and Dublin City Centre



Light vehicles travelling between the Port and the City Centre are designed to take the route shown in green in Figure 9.3 i.e. via the Promenade Road Interchange and along East Wall Road.

As explained above, the model shows that if there is no traffic management in place at Upper Sheriff Street Access, this traffic will try to use this access to avoid Promenade Road and the upper portion of East Wall Road. This is indicated by the orange route in Figure 9.3.

This would cause additional traffic flows onto the SPAR network, but also contravene the Port's aspiration to close Port Accesses along East Wall Road.

The modelling then shows that if the Upper Sheriff Street access is blocked as an option, some of these vehicles will try to travel along the SPAR and double-back along the Tom Clarke Bridge to access the City Centre, as indicated by the red route in Figure 9.3.

This is something that should be discouraged as it will add additional traffic flows to the SPAR crossing at the Liffey and at the Tom Clarke Bridge.

The modelling shows that the presence of the East Link Toll Bridge stops this routing (red route) from taking place, demonstrating that the continued presence of the East Link Toll Bridge is positive traffic control measure for the local road network.

It is accepted generally, and reiterated in the Masterplan Review, that there can never be unrestricted public access across all areas of the Port Estate. Therefore the concept of restricting access to particular streams of traffic on the SPAR is consistent with the existing precedent.

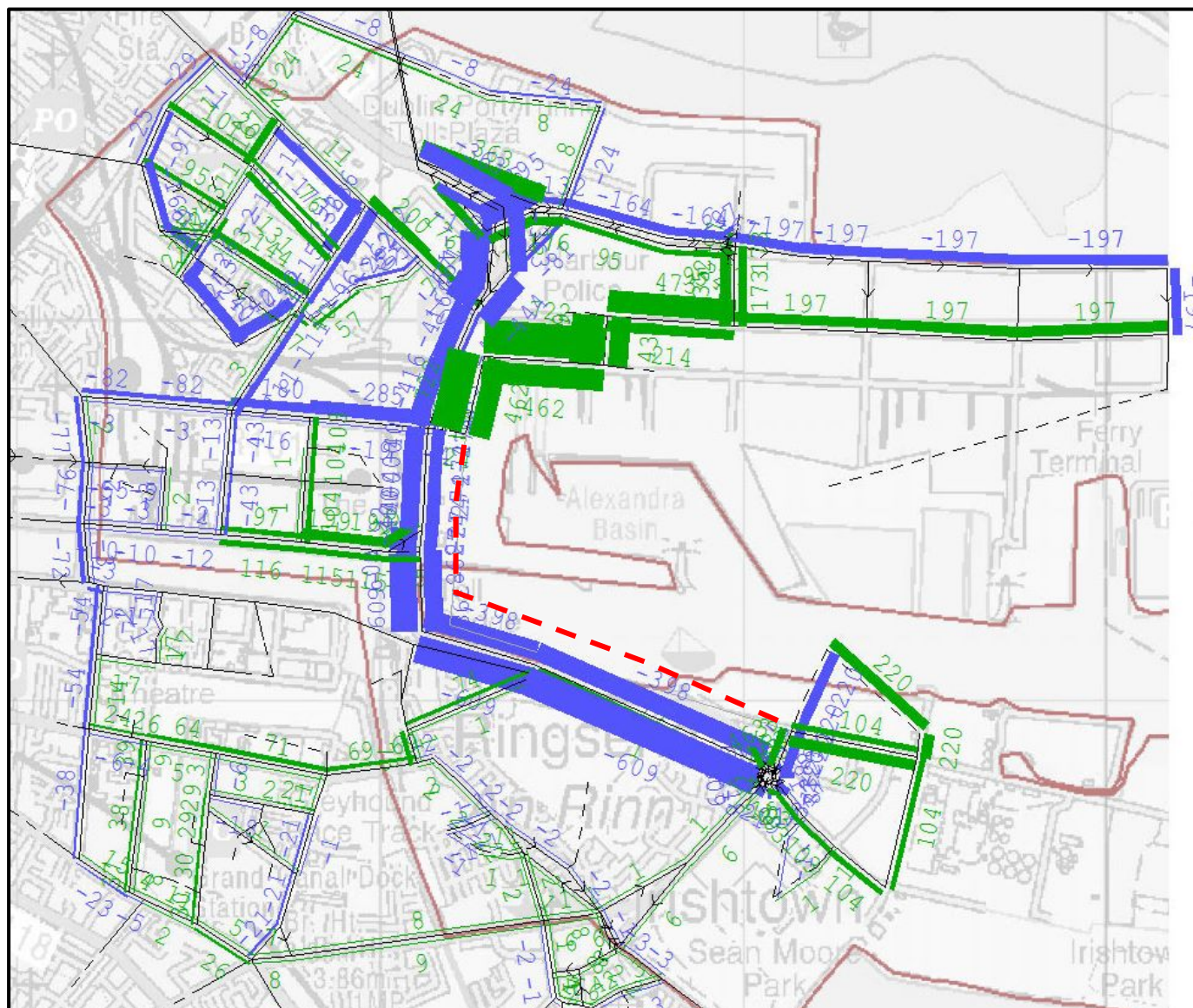
9.5 FURTHER LOCAL MODEL RESULTS

Further work was undertaken to make this local model more representative of likely future conditions over the full time horizon for the updated DPC Masterplan:

- Additional traffic growth (five years at 3.3% per annum) was applied to all movements to and from Port zones, to represent 2040 levels of demand. No additional growth was applied to other movements;
- The trip matrices were split between Port and non-Port traffic so as to be able to represent access control restrictions that limit use of the proposed SPAR to Port traffic only. The revised matrices have the same origin-destination traffic volumes, but are grouped into ten user classes – Business cars, non-Business cars, Light Goods vehicles and two classes of Heavy Goods Vehicles (OGV1 & OGV2) for Port traffic and the same categories for non-Port traffic. (Scheduled bus services are coded in the model on fixed routes);
- Traffic to and from the 2 North Docks zones in the NTA model was split between 5 zones, to better represent the spread of traffic around the Port;
- An upgrade to the Promenade Road roundabout was coded into the network to reflect the upgrade to the roundabout that currently has planning permission;
- The connection between the Upper Sheriff Street entrance to the Port Estate and the internal Port road network was modelled as unavailable to all through movements; traffic to and from one of the Port zones was modelled as accessing the road network at these points;
- Signal timings were optimised at key junctions to remove unnecessary queuing.

The model was then run with and without the SPAR in place. Figure 9.4 shows the resulting modelled change in flow in the AM peak hour. Blue lines on this diagram represent flow reduction, and green lines represent flow increase.

Figure 9.4 – AM Peak Flow Changes Resulting from the SPAR



It can be seen from this diagram that:

- The Tom Clarke Bridge is relieved of approximately 1000 pcu per hour;
- There is a small amount of traffic relief to the next bridge upriver (Samuel Beckett Bridge);
- Some traffic from south of the river to the zone representing the ferry terminal uses the SPAR, relieving Promenade Road eastbound;
- There is an increase in traffic entering the Port from the Dublin Port Tunnel, with a destination in the Southern Lands.

The model run estimates a time saving of approximately 1300 pcu-hours in the AM peak hour. In layman's terms, this is the equivalent of 1300 cars saving an hour of time each on the selected road network shown in Figure 9.4 due to the provision of the SPAR, or 2600 cars each save half an hour etc.

The model suggests that both the traffic signals on Promenade Road (on entry to the Port from the Tunnel) and the upgraded Promenade Road Roundabout will be operating at or slightly over capacity in the AM peak hour.

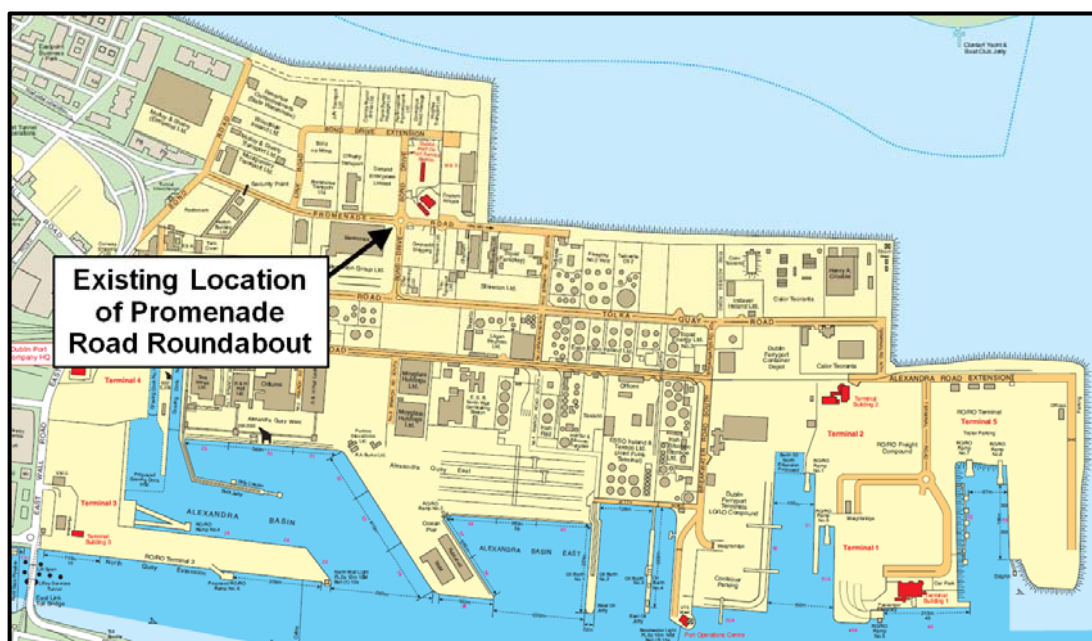
The results in the PM peak show a similar pattern of flow, with generally lower traffic levels than in the AM peak, and consequently lower benefits from relieving the congestion on East Wall Road. The model estimates savings of 270 pcu-hours in the PM peak hour, or the equivalent of 270 cars saving an hour of time each.

The local network is modelled as generally functioning within capacity, other than the Guild Street / Samuel Beckett Bridge junction on the North Quays. However, the small amount of traffic relief to the Samuel Beckett Bridge provided by the SPAR serves to mitigate the capacity of the Guild Street / Samuel Beckett Bridge junction against the No-SPAR scenario.

9.5.1 Promenade Road Roundabout

Figure 9.5 shows the existing location of the Promenade Road Roundabout.

Figure 9.5 – Location of Existing Promenade Road Roundabout



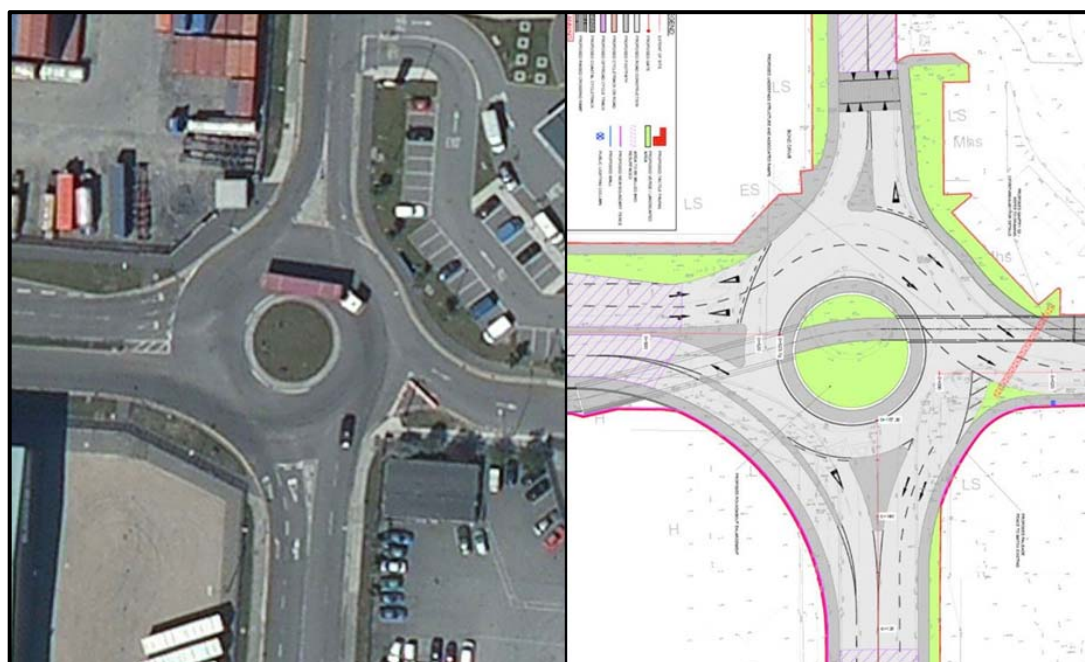
As summarised above, the modelling results are showing that the internal Promenade Road Roundabout will come under pressure in future years, particularly for traffic on the northern arm trying to gain entry onto the roundabout, for the following reasons:

- The Port accesses along East Wall Road will close causing Port traffic to divert to the Promenade Road Interchange via the Promenade Road Roundabout;
- This section of Promenade Road becomes part of the SPAR route, which will also handle traffic to and from the Southern Lands;
- Bond Road is an access road for the East Point Business Park. There is no right turn from Bond Street to exit the Port, and traffic has to u-turn at the roundabout, adding extra, non-Port related traffic movements, onto the roundabout.

In basic terms, the roundabout will accommodate nearly all of the traffic generated by the Port, and some non-Port traffic. It is a junction of key importance to the network.

The junction will be upgraded as part on the overall upgrade of the internal road network as illustrated in Figure 9.6, which shows the existing junction and the proposed upgrade side-by-side. The proposed upgrade includes a free flow left turning lane from Bond Drive Extension to Promenade Road.

Figure 9.6 – Existing Promenade Road Roundabout (left) and Future Year Committed Upgrade to the Roundabout Junction (Right)



The future actions relating to this Issue are:

- As the Masterplan is implemented, a future detailed traffic impact assessment will be required on the proposed junction to ascertain if the committed upgraded roundabout has sufficient capacity for future years, or if additional localised improvements need to be provided at the junction in future years;
- Consideration could be given to the continuation of the principle of Bond Road giving access to the Business Park or the suitability of the layout of the Bond Road/Promenade Road Junction design.

10. THE DUBLIN INLAND PORT

In the 2012 Masterplan it was proposed that some sections of land within the Port Estate would be for portcentric use such as warehousing or transshipment of unitised freight. It is explained in the Masterplan Review that DPC's view now is that the land would be better used for transit storage.

The change in the Port's view towards portcentric logistics facilities arising from the Masterplan Review is directly driven by the need to maximise the capacity of Port lands without the requirement to expand the footprint of the Port by further infill into Dublin Bay to meet projected volumes in 2040.

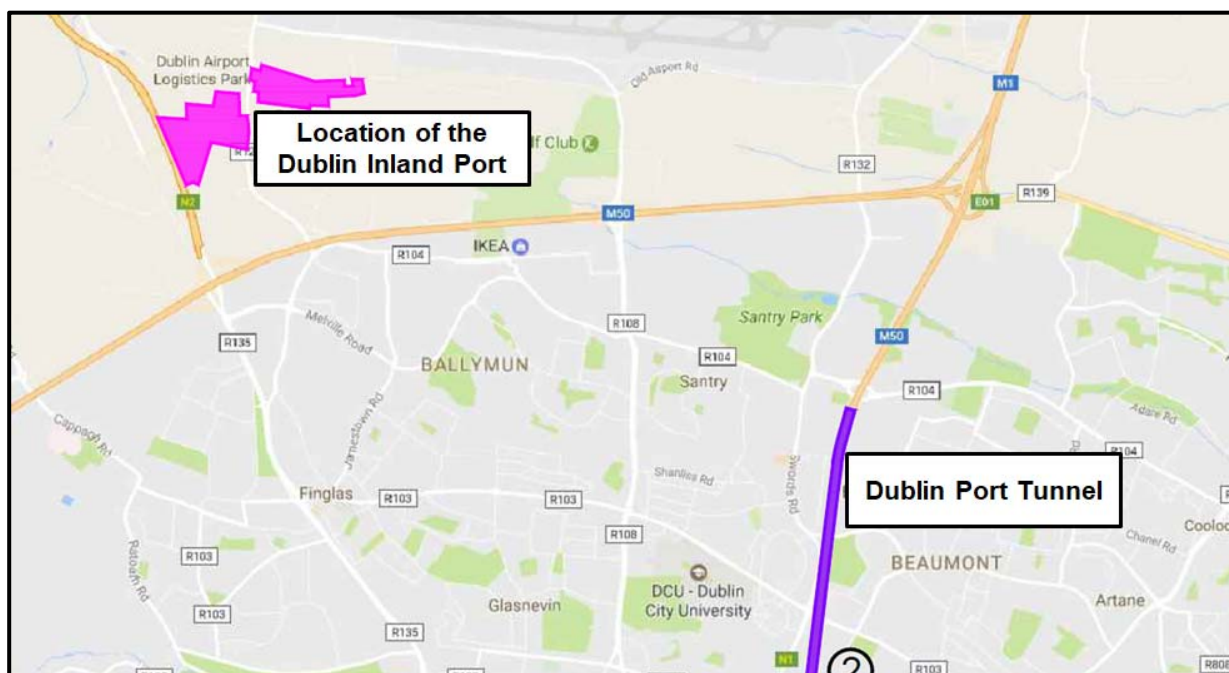
Therefore, DPC has acquired 44 hectares of lands 14km from Dublin Port to provide facilities for non-core but Port related activities. The lands are located within the administrative area of Fingal County Council and are explicitly zoned to include the activities envisaged by DPC, including a road transport depot and for transport logistics.

DPC believes that developments at Dublin Inland Port and at other locations close to the M50 can better meet the requirements for Port-related but non-core activities including logistics services.

The Dublin Inland Port is at an early stage of development. Planning permission has been granted for an access road, gated entrance, boundary fence, signage and lighting. A planning submission is due in Q2 2018 for an initial phase of the internal layout, with a view to commencing construction on site in approximately 2018/2019.

The Dublin Inland Port, the location of which is illustrated in Figure 10.1, has excellent connectivity to the strategic road network, further enhanced by the following road upgrade schemes carried out on the surrounding road network over the last decade:

- The Dublin Port Tunnel;
- N2 realignment between Finglas M50 Junction and Rath to the north of Ashbourne;
- The upgrade of the Finglas M50 Interchange with the M5;
- The M50 Upgrade;
- The construction of the South Parallel Road.

Figure 10.1 – Location of the Dublin Inland Port to the Strategic Road Network

Planning history research shows that the site has planning permission for a level of traffic that may mitigate, or partly mitigate, expected traffic flows to be generated by the Dublin Inland Port.

Localised access enhancements between the site and the strategic road network may be required to ensure that the site can adequately connect to the strategic road network. This may require new or upgraded junctions, site accesses or access road link enhancements.

A consideration for the site in traffic capacity terms will be the cumulative impact of other committed and proposed developments in the area that could be similar in nature to operations envisaged at Dublin Inland Port.

This will be assessed in detail as each phase of the Dublin Inland Port progresses to Planning stage.

Finglas County Council have commissioned a study to consider the infrastructure requirements to facilitate planned development within what is referred to as the 'south fringe study area'. The rationale for the study was to address concerns from bodies such as TII and NTA, relating to the cumulative impact of large scale developments within the close proximity, including Dublin Airport Masterplan.

The study will initially consider full build out of lands as per the developer's information supplied to assess the capacity of the existing road network. From this point, modifications will be made including new infrastructure but also potential restrictions on the quantum of development to improve the network's operation. The study will cover the period up to 2027 and 2035. The analysis will be carried out using the NTA's Eastern Regional Model and the findings are due towards the end of 2018.

As explained above, Dublin Inland Port will facilitate non-core users that have been relocated from the Northern Lands. This has the potential to reduce traffic volumes through the Tunnel as the requirement for vehicles to double-back through the Tunnel to collect and deposit empty containers from storage located on core Port lands will be reduced. The surplus capacity in the Tunnel can be used for the core vehicle movements at the Port.

11. DUBLIN PORT TRAVEL PLAN

The relevant key objectives and aspirations of the Masterplan Review relating to sustainable travel have been collated below and have the potential to be amalgamated into a new comprehensive Dublin Port Travel Plan. These include:

- Provide for a public transport route to serve passengers and those working within the Port to improve the modal transport split;
- Ensure that the north Port Estate secures public transport provision to the passenger ferry terminals. This public transport provision could be through either the provision of a dedicated bus route or the extension of the existing bus route to link with the LUAS terminal at the 3 Arena;
- Provide public transport links through the Poolbeg Peninsula down to the Great South Wall;
- Promote non-motorised sustainable transport modes, including cycling and walking;
- Facilitate access for pedestrians and cyclists in the Port through the improvement of cycleways and footpaths within and throughout the Port. This includes the creation of a pedestrian and cycle greenway on the northern perimeter of the Port overlooking the Tolka Estuary and an examination the opening of access to the Great South Wall eastwards from Pigeon House Harbour;
- Maximise and promote the use of rail transport for goods to and from the Port;
- Enhance existing infrastructure to provide dedicated access / exit routes to Port facilities;
- Pursue some specific supply chain and transport initiatives aimed at facilitating the achievement of the sustainable transport objectives set out in both EU and national Policies;
- Promote in the development of future Port facilities the principles of universal design to make environments inherently accessible for those with and without disabilities;
- Tourism visits – Facilitate access to tours and groups that wish to see the Port both from the land side and the water side;
- Cruise Passengers - Based on the principles established within the ABR project relating to the relocation the cruise liners closer to the city centre at North Way Quay Extension, the Travel Plan will incorporate the movement of passengers from cruise ships accessing the city directly to facilitate an increased usage of the city's public transport infrastructure;
- Car Access – Examine proposals to provide for car parking at an appropriate area in the Port for people who wish to come and see the Port at weekends;
- Educational Tours – Manage the movement and transport needs associated with educational tours of the Port for schools.

The Masterplan Review specifically makes a commitment to progress a new Travel Plan based on the possibilities offered by the following specific initiatives:

- Provision of cycle lockers at Port Centre to facilitate workers in the Port to use public transport;
- Development of an innovative and environmentally friendly (e.g. electric or hydrogen fuelled) bus operation to service the Port Estate, including passenger ferry terminals, and to link the Port to Dublin City's public transport networks;
- Development of a partnership with DCC and the Irish Nautical Trust to re-establish a Liffey ferry service using Ferry Number 11 (the last remaining ferry);
- Closing of Port access along East Wall Road and the opening of a new access at Upper Sheriff Street to service Port Centre and the river berths where cruise ships will berth.
- Co-ordination with DCC to complete the Point Roundabout Scheme to improve the public road network at the junction between the Tom Clarke Bridge, East Wall Road and North Wall Quay;
- Co-ordination with NTA and DCC to complete the project to develop the road link connecting from the southern end of the Dublin Port Tunnel to the South Port area to serve the South Port and adjoining development areas.

The commencement of the project to redevelop the Port's internal road, cycle and pedestrian network is considered as the foundation to make possible the development of the new Travel Plan with an emphasis on safe access throughout the Port Estate for cyclists and pedestrians and efficient links with local public transport networks.

The Travel Plan will enshrine and take continued cognizance of the relevant policies and initiatives that informed the Masterplan Review. These include:

- The EU Transport 2050 Strategy policy context;
- Smarter Travel – A Sustainable Transport Future 2009 - 2020 (2009) policy document, which sets out a broad vision for the future and establishes objectives and targets for transport. It sets out a vision for sustainability in transport centred around five key goals:
 - Reducing travel demand;
 - Maximising the efficiency of the transport network;
 - Reducing reliance on fossil fuels;
 - Reducing transport emissions;
 - Improving accessibility to transport.

The Travel Plan will also enshrine the commitment for ongoing stakeholder consultation including:

- Working with DCC on the implementation of the programmes and initiatives designed to secure greater integration between the Port and the City;
- Work closely with the NTA and TII on the development of prospective projects arising from the Masterplan to assess both the impact on existing and planned transport networks and to ensure consistency with national and regional transport policy objectives.

Essentially the remit of the comprehensive Dublin Port Travel Plan could formalise three main themes:

- Feasibility and planning of sustainable transport enabling measures;
- Construction and delivery of sustainable transport enabling infrastructure;
- Developing a suite of management measures to control and monitor sustainable travel at the Port.

As the Masterplan continues to be implemented a project specific Travel Plan, or a Motability Management Plan, could be developed for each project or phase within the Port to allow site specific measures and mechanisms relevant to that particular operation to be progressed and managed. This will also ensure that each project specific Travel Plan is relevant to, and continually updated to, the emerging policies and initiatives relevant at the time of writing. Feedback from the project specific Travel Plan / Motability Management Plan could be relayed back to inform the overarching Dublin Port Travel Plan.

12. SUMMARY AND FINDINGS

Key Schemes Relevant to the Study

There are several schemes and transportation infrastructure improvements, both within the Port and within its environs, which are of particular relevance to this Study. They vary in size and scale. Some have already obtained planning permission, and others are proposals at different stages of progression. These include:

- ABR Project and Committed Closure of the Port Accesses Along the East Wall Road;
- DCC Scheme along East Wall Road;
- Poolbeg West SDZ;
- Extension of the Luas Red Line Across the Liffey;
- Proposed road link connecting the end of the Port Tunnel to the Poolbeg Peninsula.

Walking & Cycling

The report emphasises the extensive nature of the additional walking and cycling facilities that are contained within the Masterplan Review. These will provide a much enhanced improvement over the existing infrastructure, facilitate the Port's aspirations relating to social integration and integration of sustainable transport modes, and will be incorporated into the Dublin Port Travel Plan.

Public Transport

It has been demonstrated that the suite of committed and proposed public transport enhancements being proposed by DPC within the Masterplan Review and by others will fill the gaps in the public transport provision that currently exists.

The Northern Lands will have a more frequent bus service, which connects the dominant person generating land use zone of the Unified Ferry Terminal to the Luas, and potentially the Dart, in an integrated manor. This service, combined with the enhanced internal roads, walking and cycle facilities being provided by DPC, facilitates a multi-modal integrated sustainable transport option.

The Southern Lands and the Poolbeg Peninsula will be served by several public transport options, providing enhanced connectivity and synergies for both the Port lands and the Poolbeg West SDZ Planning Scheme. Again, the improvements in walking and cycling connections on the Poolbeg peninsula, including the committed DCC scheme at East Wall Road to signalise the Point Roundabout, facilitates multi-modal integrated sustainable transport options.

The current lack of connection across the Liffey is addressed by the proposal to allow public transport services on the SPAR, the potential extension of the Luas Red Line and the potential re-establishment of the Liffey ferry service. Note also that the provision of the SPAR will remove traffic from the Tom Clarke Bridge, particularly heavy vehicles, potentially providing the opportunity for improved pedestrian and cycling facilities on the bridge.

The Port is a key component of the national tourism sector and represents a gateway for visitors to Ireland. The enhanced suite of sustainable transport provisions provide a range of opportunities for tourists to the Port the passengers from cruise ships, berthed at the North Wall Quay Extension as part of the ABR Project, to access the city directly and ensure an increased usage of the city's public transport infrastructure.

The delivery of the public transport enhancements will contribute towards achieving the Port's aspirations relating to social integration, its role as a gateway for visitors to Ireland and integration of sustainable transport modes. These will also be incorporated into the new Dublin Port Travel Plan.

Rail Freight

The level of freight that is transported by rail remains comparatively low but DPC believes that there is potential for rail freight to grow over the period of the Masterplan. This has already been evident in the growth in rail freight services in the period between 2012 and 2017.

The continued promotion for use of the rail and the careful retention of existing infrastructure and access routing is consistent with one of the core challenges in the EU White Paper (Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, 2011) to ensure that the Port is sufficiently connected to the rail freight and a modal shift towards its use is encouraged.

DPC has committed to continue to examine the potential for private sector operators to offer container freight services to a range of destinations, an objective that will be included in the Dublin Port Travel Plan.

The rail freight services access the Port via Alexandra Road junction with East Wall Road, which although will be closed to all operational Port traffic, will continue to accommodate the rail freight services.

A bridge over the Alexandra Road will eliminate the disruption between the rail freight services and operational vehicles traversing between Plot A₁ and Plot A₂.

Methodology for Strategic Transport Modelling

A three-stage approach to forecasting and assessing future traffic levels in the vicinity of the Port was carried out.

Stage 1

The first stage was preliminary analysis of traffic data to establish volumes of Port-related traffic and constraints to traffic growth. Key observations relating to Stage 1 include:

- There are approximately 17,000 vehicles per day entering and leaving the Northern Lands to/from the local road network and 1,400 vehicles per day entering and leaving the Southern Lands, totalling 18,400 daily two way vehicles generated by the Port per day;
- There are five principal routes for vehicles leaving the vicinity of Dublin Port, Dublin Port Tunnel, East Wall Road, Sheriff Street Upper, North Wall Quay and R131 South;
- The Dublin City Centre HGV Management Strategy bans vehicles with 5 or more axles travelling between the hours of 07:00 and 19:00 to within a cordoned area around Dublin City Centre, However the dominance of the Dublin Port Tunnel does not apply to other vehicle types that are not subject to the ban (and are subject to tolls for using the Tunnel);

- Currently, the banned right turns along East Wall Road cause significant volumes of traffic to U-turn at The Point Roundabout.

Stage 2

The second stage used a simple local all-day traffic model, based on observed traffic levels, to compare future traffic flows with and without the SPAR.

The assessment considered forecast traffic flows for the three scenarios of interest for the year 2040:

- Option 1: 2.5% AAGR levels of Port traffic, no SPAR;
- Option 2: 3.3% AAGR levels of Port traffic, no SPAR;
- Option 3: 3.3% AAGR levels of Port traffic, with SPAR.

Stage 3

The third stage involved more detailed modelling based on a run of the NTA strategic multi-modal model of the Greater Dublin Area to assess the AM and PM peak hours.

Subsequently, a local model cordon was extracted from this run to test scenarios with and without the SPAR.

RPS met with and liaised with NTA on an-going basis between October 2018 and March 2018 in relation to the run of their strategic multi-modal model.

Findings of the Strategic Transport Modelling

Capacity of the Dublin Port Tunnel

- Within the NTA Regional Transport Model for the Greater Dublin Area, the Port Tunnel is coded with a capacity of 3800 pcus per hour per direction, equating to 182,400 pcus per day.
- The data shows that currently the Tunnel is operating at approximately half of its modelled capacity, with one-way flows exceeding 1900 pcu/hour per direction experienced for only short periods.
- Port related traffic experiencing 3.3% growth per year equates to 52,700 pcus per day by 2040.
- Non-Port traffic experiencing growth to the Dublin forecasts in TII Project Appraisal Guidance, equates to 30,100 pcus per day.
- Therefore, at the end of the Masterplan period, 2040, the traffic flows through the tunnel are estimated to be 82,900 pcus per day, below the daily capacity coded into the NTA Regional Transport Model of 182,400 pcus per day.
- Peak hour analysis also shows that the 2040 predicted flows never exceed the 3800 pcu/hour per direction. Further peak hour modelling based on the NTA run of the Regional Model (Stage 3 of the strategic modelling process) confirms that the Dublin Port Tunnel operates will operate well within capacity during the AM and PM peak hours.

- The assessment therefore concludes that the Dublin Port Tunnel has adequate capacity to accommodate the increased 3.3% AAGR by 2040 based on the capacity coded into the NTA Regional Transport Model;
- The study also finds that tolls at the Toll Plaza are not a limiting factor to the capacity of Tunnel. In any case, TII intend to replace the tolling related equipment and software at the plaza within in the next 18 months and expect the upgrade to result in the performance of the tolls to be significantly better than existing;
- Furthermore, TII are considering upgrading the toll collection system to be free-flow in future years, likely to happen before the 2040 horizon year for the Masterplan.

Traffic Flows on the SPAR

- Option 3 results shows that the SPAR is predicted to carry around 12,900 pcus each working day in the design year of 2040 at the section that crosses the Liffey, a level for which a single-carriageway road is appropriate.

Reduction of Traffic Flows on the Tom Clarke Bridge

- Results show that the 12,900 pcus per day predicted on the SPAR in the design year of 2040 relieves the Tom Clarke Bridge of approximately one-third of its traffic, from 34,880 pcus per day in Option 1 and 37,200 pcus per day for Option 2, reducing to 24,290 pcus per day in Option 3. Therefore Option 3 has 10,590 pcus per day less than Option 1.
- During the AM peak hour the SPAR will relieve the bridge of approximately 1000 pcu per hour.

Reduction of Traffic Flows on the East Wall Road

- Traffic flows on the East Wall Road are Option 1 (58,665 pcus per day) and Option 2 (63,240 pcus per day).
- The results show that with the introduction of the SPAR (Option 3) traffic on the East Wall Road reduces to 50,790 pcus per day, less than for Option 1 and Option 2.
- This represents a 14% reduction in the traffic flows on East Wall Road compared to the no-SPAR base scenario.

Reduction of Typical Journey Travel Times for Through Traffic between Sean Moore Road and the Dublin Port Tunnel

- Without the SPAR, traffic levels and journey times on East Wall Road will increase significantly.
- The results show that it typically it currently takes 523 seconds to travel northbound from Sean Moore Roundabout to the Tunnel. This will increase to 781 seconds for Option 1 and 924 seconds for Option 2. However, the introduction of the SPAR in Option 3 reduces the travel time back to 583 seconds, less than the Option 1 results.
- Similarly, the results show that it typically it currently takes 515 seconds to travel southbound from the Tunnel to Sean Moore Roundabout. This will increase to 567 seconds for Option 1 and 589 seconds for Option 2. However, the introduction of the SPAR in Option 3 reduces the travel time back to 545 seconds, less than the Option 1 results.

- Hence, typical journey times are reduced by 25% northbound and 4% southbound compared to the no-SPAR based scenario.

Travel Time Savings On Network

- The model run estimates a time saving of approximately 1300 pcu-hours in the AM peak hour and 270 pcu-hours in the PM peak hour on the extent of the network within the extracted cordon. This is the equivalent of 1300 cars saving an hour each in the AM peak hour and 270 cars saving an hour each in the PM peak hour.

Reduction of Flows at the Guild Street / Samuel Beckett Bridge junction

- The local network is modelled as generally functioning within capacity at the end of the Masterplan with the additional Port growth during the peak hours with the SPAR, other than the Guild Street / Samuel Beckett Bridge junction on the North Quays. However, the small amount of traffic relief to the Samuel Beckett Bridge provided by the SPAR serves to mitigate the capacity of the Guild Street / Samuel Beckett Bridge junction against the No-SPAR scenario.

Benefit of Allowing Traffic from the South to the Northern Lands onto the SPAR

- The model shows that allowing traffic from south of the river Liffey use the SPAR to access the Northern Lands relieves the Promenade Road in the eastbound direction.

Reassignment to Traffic Bound for the Southern Lands Towards Tunnel

- The model shows that there is an increase in traffic entering the Port from the Dublin Port Tunnel with a destination in the Southern Lands, which provides benefit to the local road network.

In summary, without the SPAR, traffic levels and journey travel times on East Wall Road will increase significantly. Traffic modelling carried out for the Study gives measurable indicators (traffic levels and journey times) which demonstrate that the SPAR provides mitigation, to better than no-net-determent, for the increased traffic flows generated by the additional growth at the Port. i.e. the road network performs better for the 3.3% AAGR with the SPAR than for the 2.5% AAGR without the SPAR already engrained in the 2012 Masterplan.

Transport Related Issues identified by the Study

The transport related issues identified by the Study are as follows:

- The traffic signalled junction giving entry to Promenade Road from the Tunnel, and the internal Promenade Road Roundabout will come under pressure in future years. The roundabout will accommodate diverted traffic due to the access closures on East Wall Road, becoming part of the SPAR route, and accommodating non-Port traffic from the East Point Business Park. Basically, the roundabout will accommodate nearly all of the traffic generated by the Port, and some non-Port traffic – some 79,000 pcus per typical weekday. It is a junction of key importance to the network and will be the subject of detailed junction modelling associated with future planning applications to determine if the committed roundabout has adequate capacity or if localised improvements are required in future years;
- Consideration could be given to the continuation of the principle of Bond Road giving access to non-Port users.

- Traffic management measures will need to be in place to prevent the SPAR from becoming a rat-run;
- In particular, traffic management will be required at the new Upper Sheriff Street Access, to not only prevent rat-running on the SPAR for non-Port vehicles, but to also prevent Port traffic to/from the Northern Lands using this access to avoid Promenade Road;
- The SPAR will interact with the railway along an internal section of the Alexandra Road. Traffic management will be required to manage this interaction, similar to the traffic management of the railway which is already an established daily practice within the area.
- The continued presence of the East Link Toll Bridge has a role to play in the traffic management. It's generally a better scenario for the Port for the East Link Toll to remain in place. When it is in place the measured relief provided by the SPAR is greater. It also discourages light vehicles traveling between the Northern Lands and the City Centre to use the SPAR and the Tom Clarke Bridge to double-back across the River Liffey. However, when it is in place it will encourage rat-running onto the SPAR, which again highlights the importance of traffic management at the Upper Sheriff Street Access.

Dublin Inland Port

The Dublin Inland Port has excellent connectivity to the strategic road network.

Localised access enhancements between the site and the strategic road network may be required to ensure that the site can adequately connect to the strategic road network.

A consideration for the site in traffic capacity terms will be the cumulative impact due to other committed and proposed developments in the area that could be similar in nature to operations envisaged at Dublin Inland Port. This will be assessed in detail as each phase of the Dublin Inland Port progresses to Planning stage.

Finglas County Council have commissioned a study of the 'south fringe study area' to address transportation concerns relating to the cumulative impact of large scale developments within the close proximity. The analysis will be carried out using the NTA's Eastern Regional Model and the findings are due towards the end of 2018.

It is anticipated that Dublin Inland will facilitate non-core users that have been relocated from the Northern Lands. This has the potential to reduce traffic volumes through the Tunnel as the requirement for vehicles to double-back through the Tunnel to collect and deposit empty containers from storage located on core Port lands will be reduced. The surplus capacity in the Tunnel can be used for the core vehicle movements at the Port.

Dublin Port Travel Plan

The Masterplan Review makes a commitment to progress a new comprehensive Dublin Port Travel Plan to incorporate the relevant key objectives and aspirations of the Masterplan Review based on the possibilities offered by specific initiatives.

Essentially the remit of the comprehensive Dublin Port Travel Plan could formalise three main themes:

- Feasibility and planning of sustainable transport enabling measures;
- Construction and delivery of sustainable transport enabling infrastructure;

- Developing a suite of management measures to control and monitor sustainable travel at the Port.

As the Masterplan continues to be implemented a project specific Travel Plan, or a Motability Management Plan, could be developed for each project or phase within the Port to allow site specific measures and mechanisms relevant to that particular operation to be progressed and managed. This will also ensure that each project specific Travel Plan is relevant to, and continually updated to, the emerging policies and initiatives relevant at the time of writing. Feedback from the project specific Travel Plan / Motability Management Plan could be relayed back to inform the overarching Dublin Port Travel Plan.

Appendix 1

Indicative Design and Routing of the SPAR used within the Report for Modelling purposes



LEGEND

POSSIBLE NEW OR UPGRADED ROAD	
PERMITTED ROAD	
GREENWAY	



LEGEND

POSSIBLE NEW OR
UPGRADED ROAD

PERMITTED ROAD

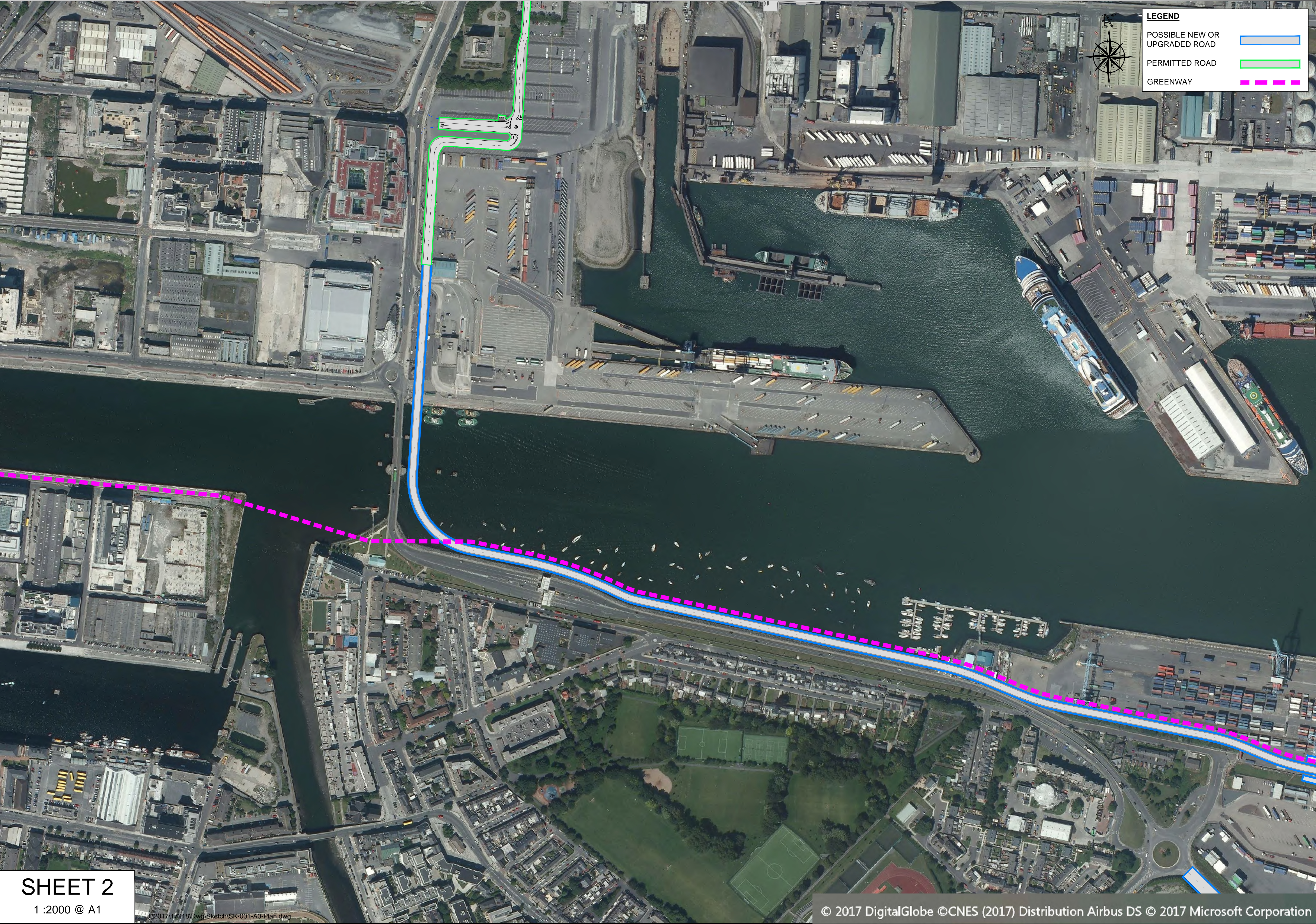
GREENWAY

SHEET 1

1:2000 @ A1

J:\2017\17218\DWG\Sketch\SK-001-A0-Plan.dwg

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LEGEND

POSSIBLE NEW OR UPGRADED ROAD

PERMITTED ROAD

GREENWAY



LEGEND	
POSSIBLE NEW OR UPGRADED ROAD	
PERMITTED ROAD	
GREENWAY	



SHEET 3

1:2000 @ A1

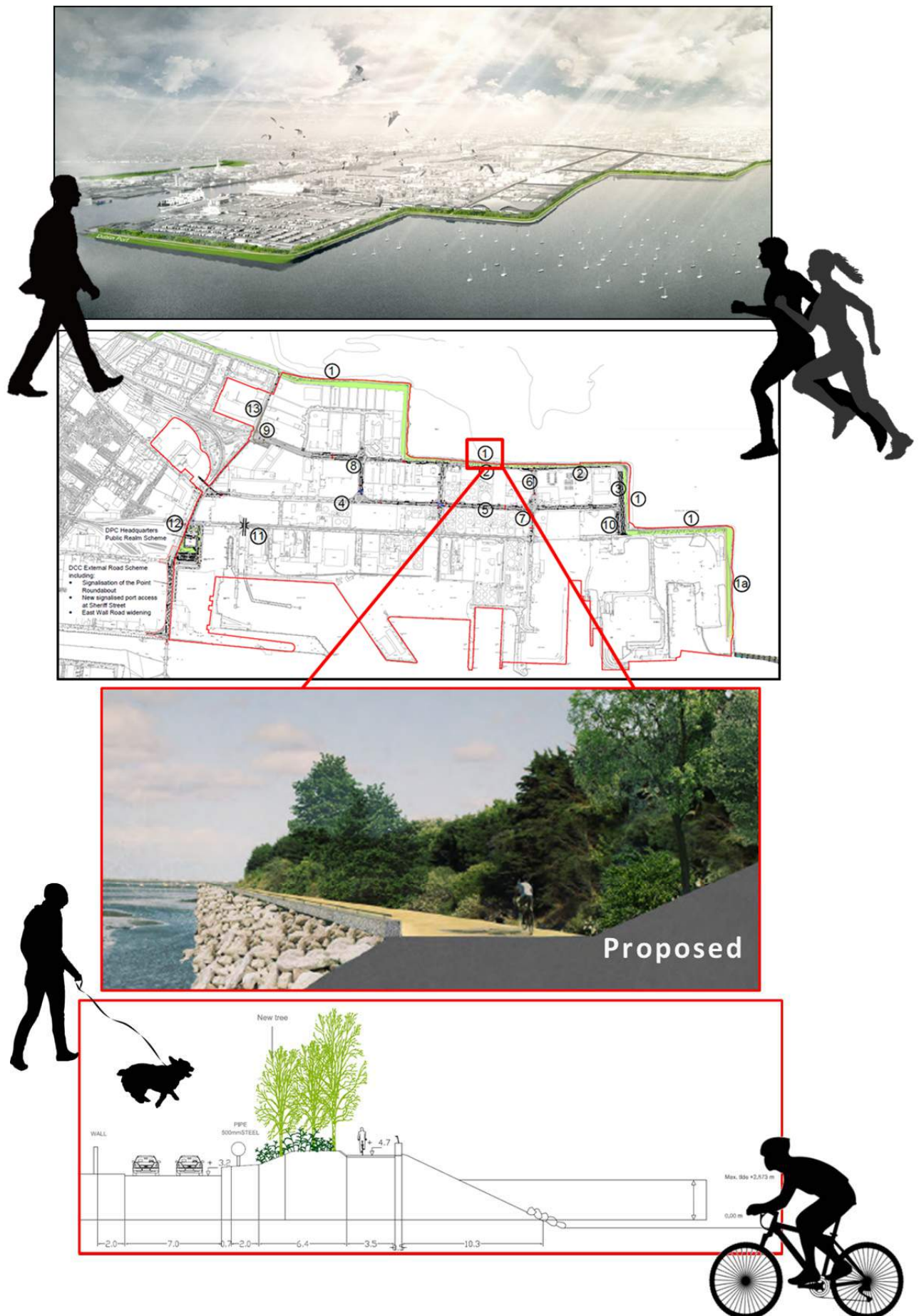
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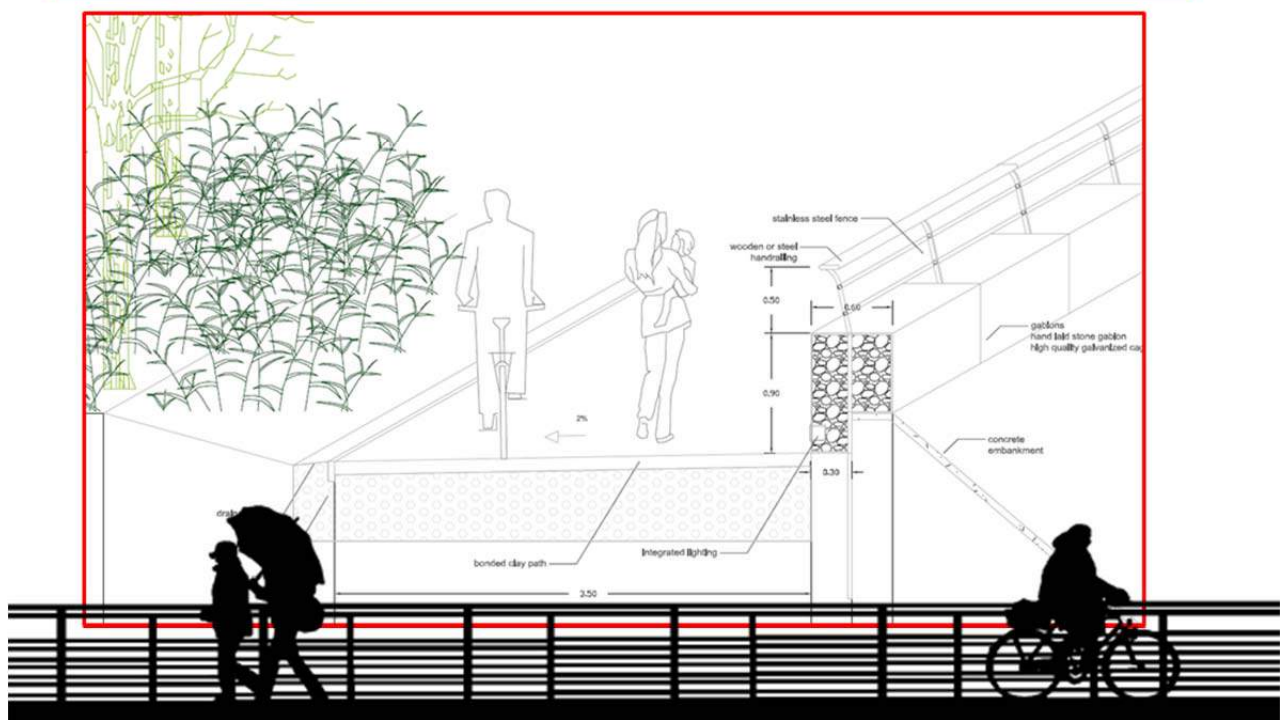
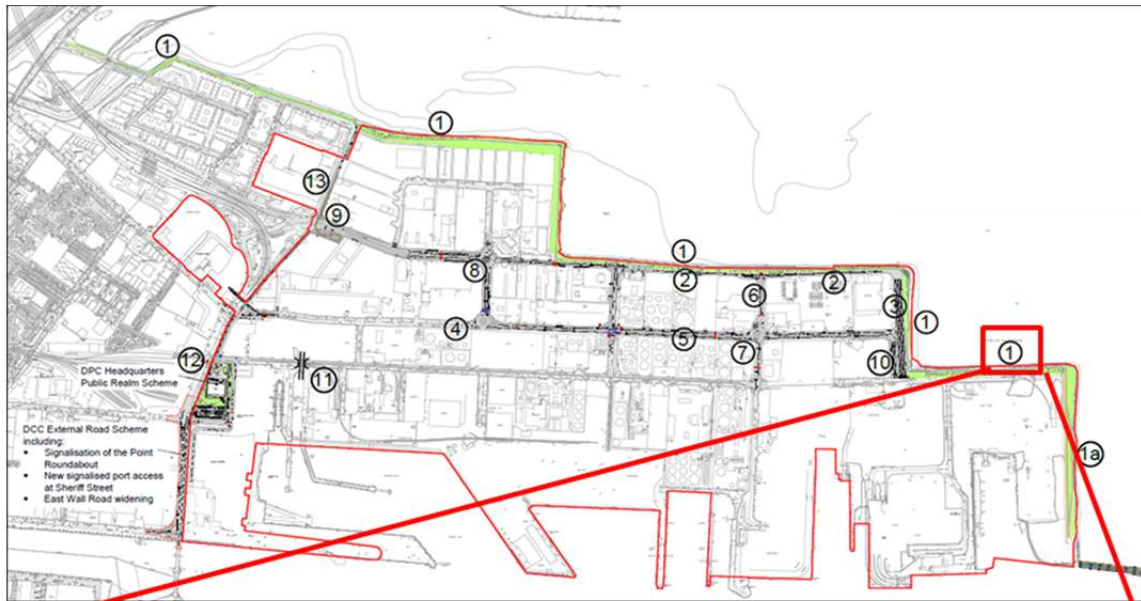
Appendix 2

12 Images that bring into focus some of the Key Aspects of the Enhanced Walking and Cycling Network on both the Northern and Southern Lands

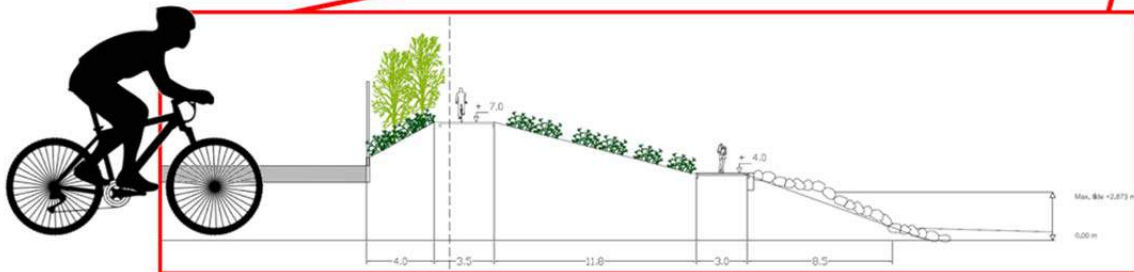
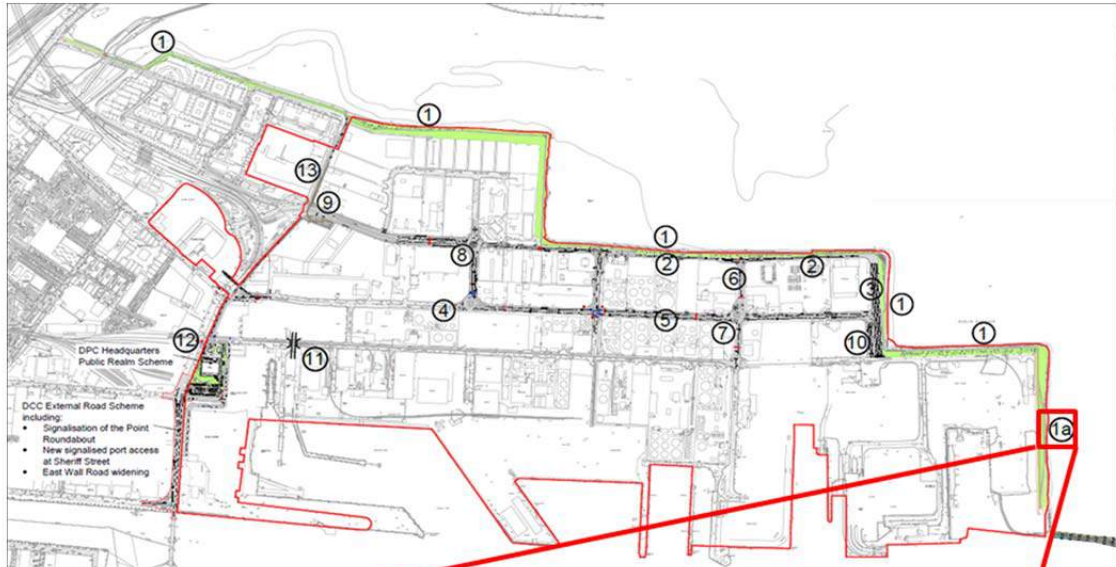
Northern Side 1: A part of the proposed 4km cycle and pedestrian Greenway along the Northern Shoreline



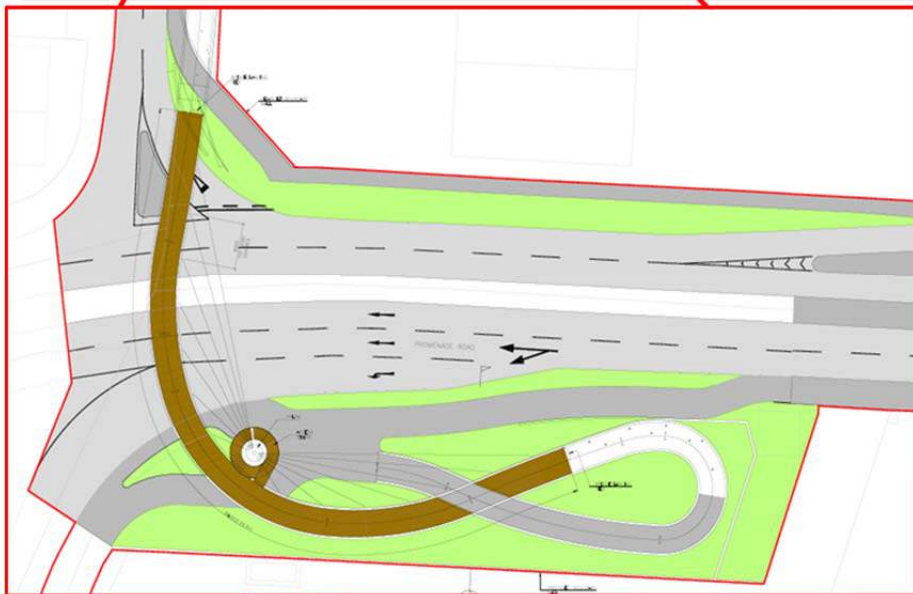
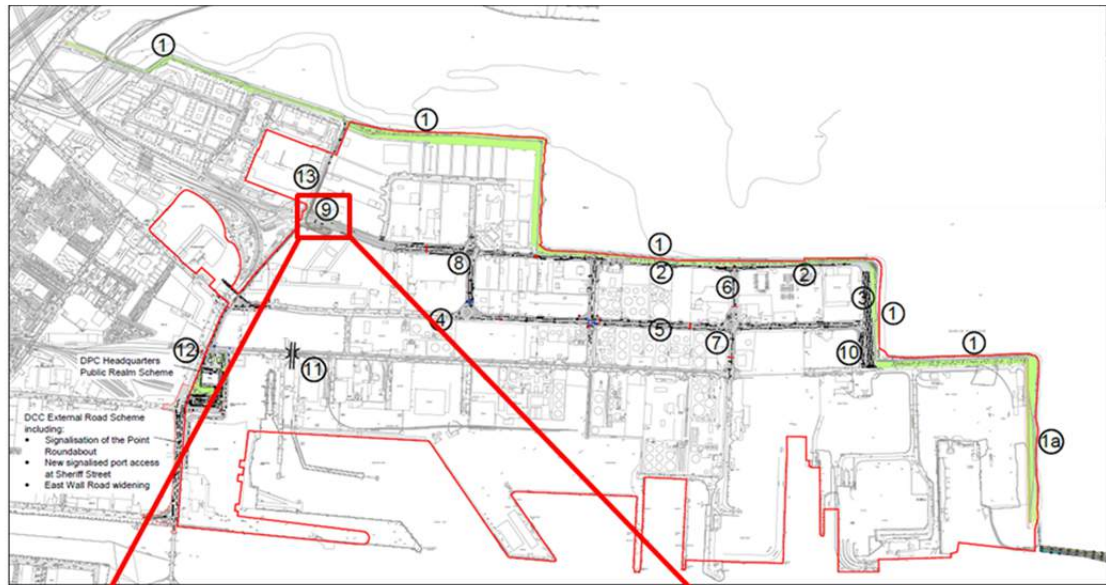
Northern Side 1: A part of the proposed 4km cycle and pedestrian Greenway along the Northern Shoreline



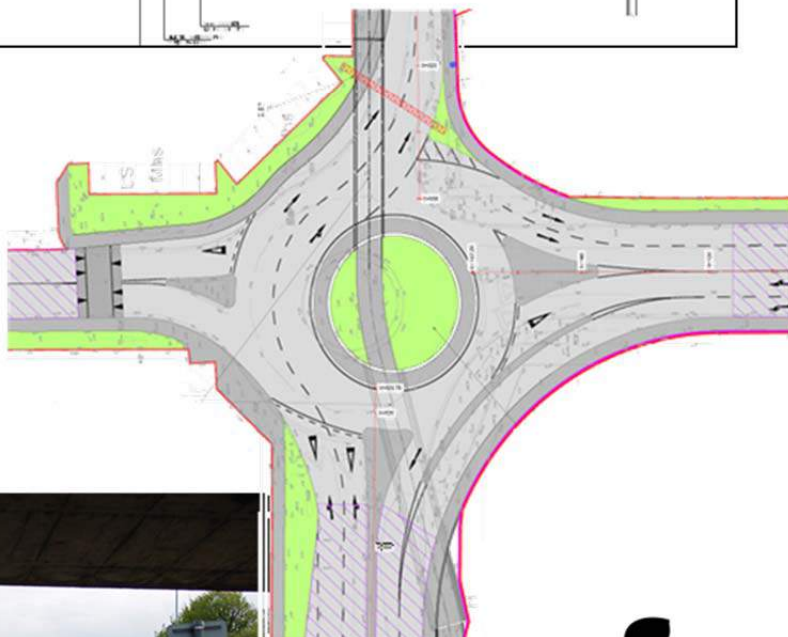
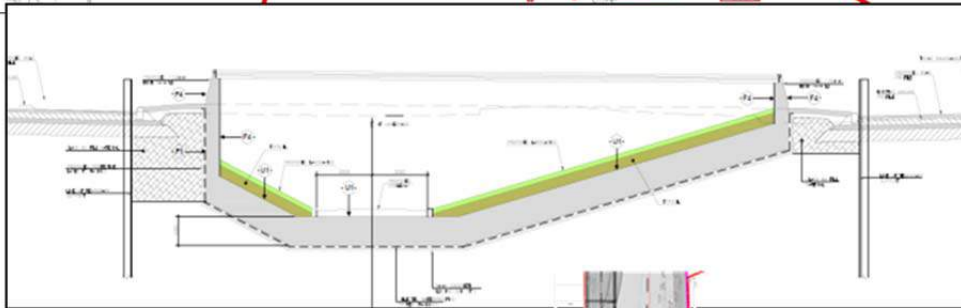
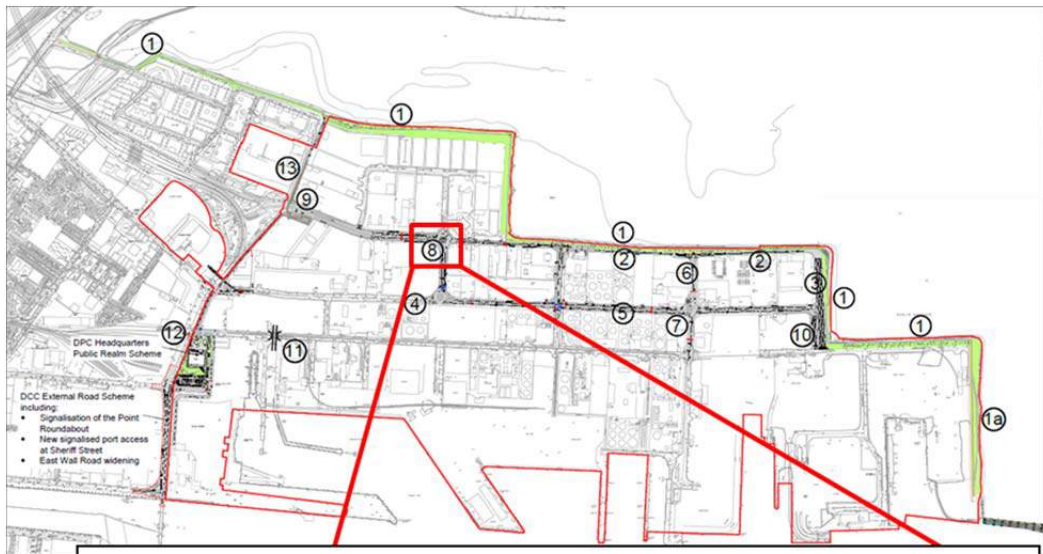
Northern Side 1a: Two-tier Linear Park at the Eastern Terminal Area



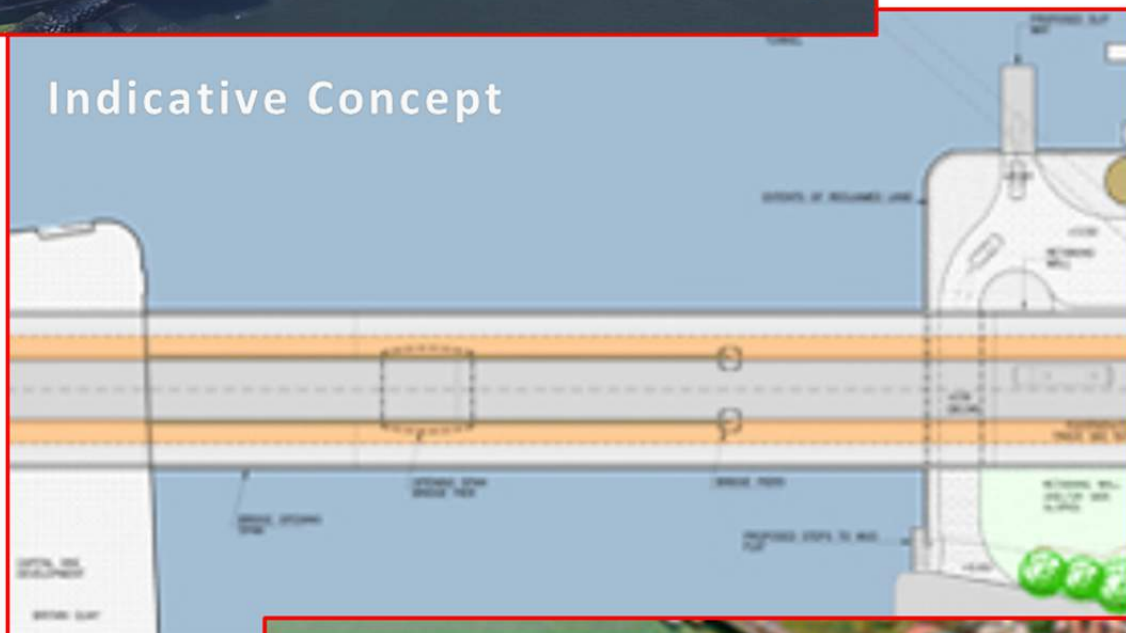
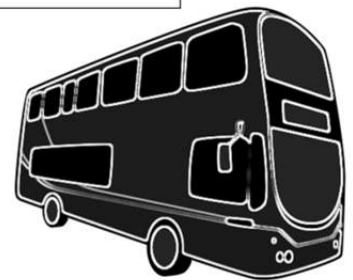
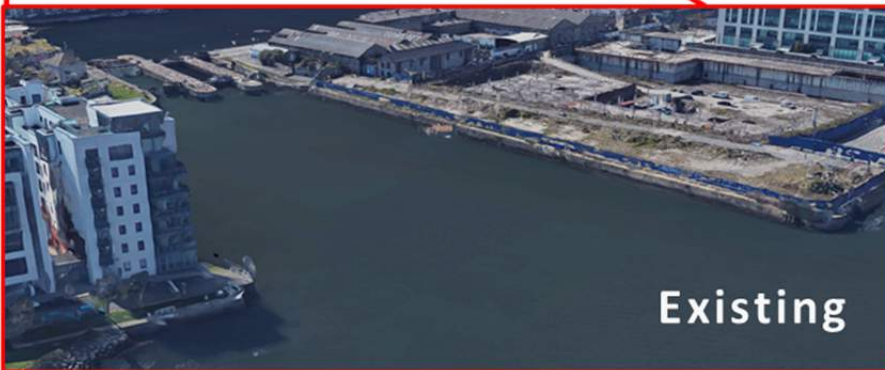
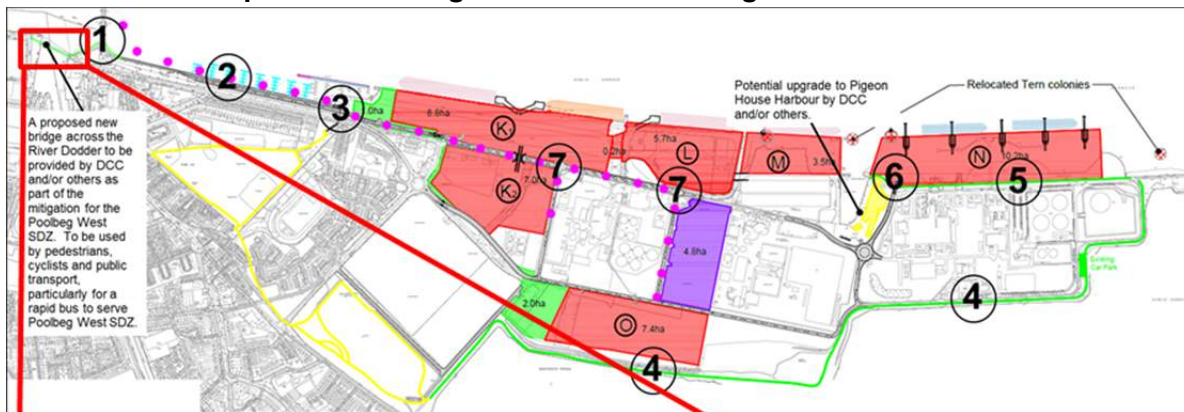
Northern Side 9: New Landmark bridge structure to provide pedestrian and cycle access across Promenade Road



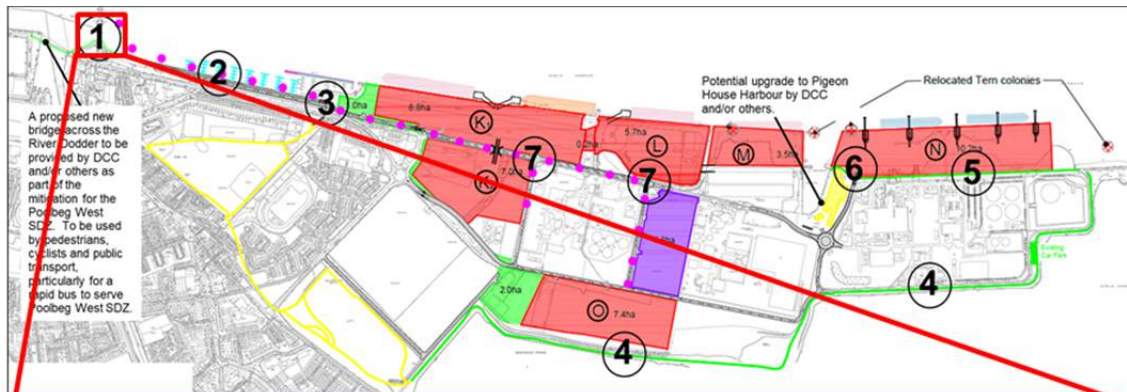
Northern Side 8: Enlarged roundabout at the Topaz Service Station with pedestrian /cycle underpass



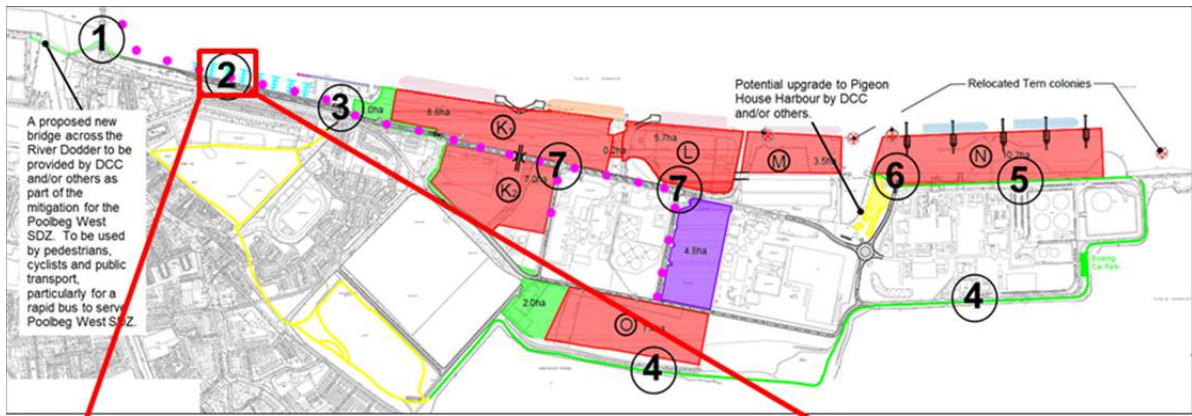
Southern Side: Proposed new bridge across the River Dodder to be provided by DCC and/or others as part of the mitigation for the Poolbeg West SDZ



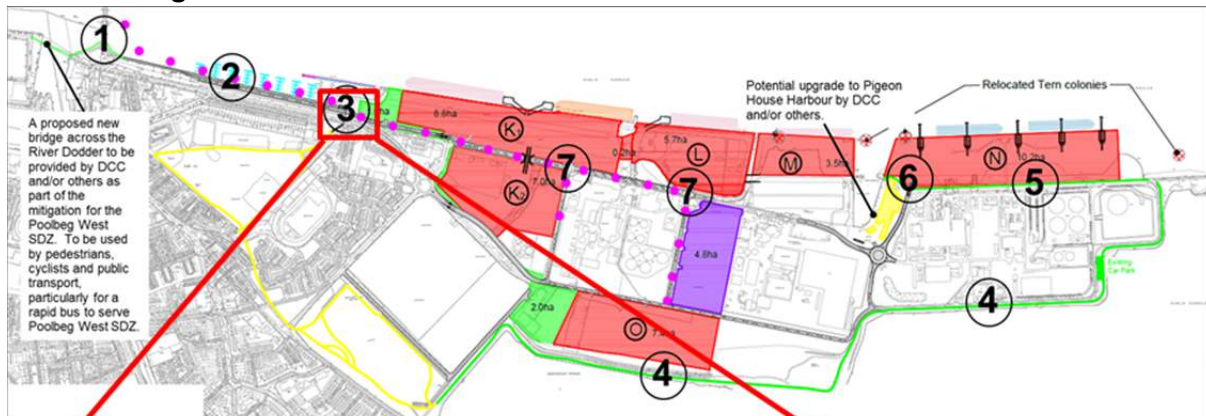
Southern Side 1: Indicative Concepts for proposed new access connection Via Tom Clarke Bridge to new Marina Walk to be located to the North of the SPAR.



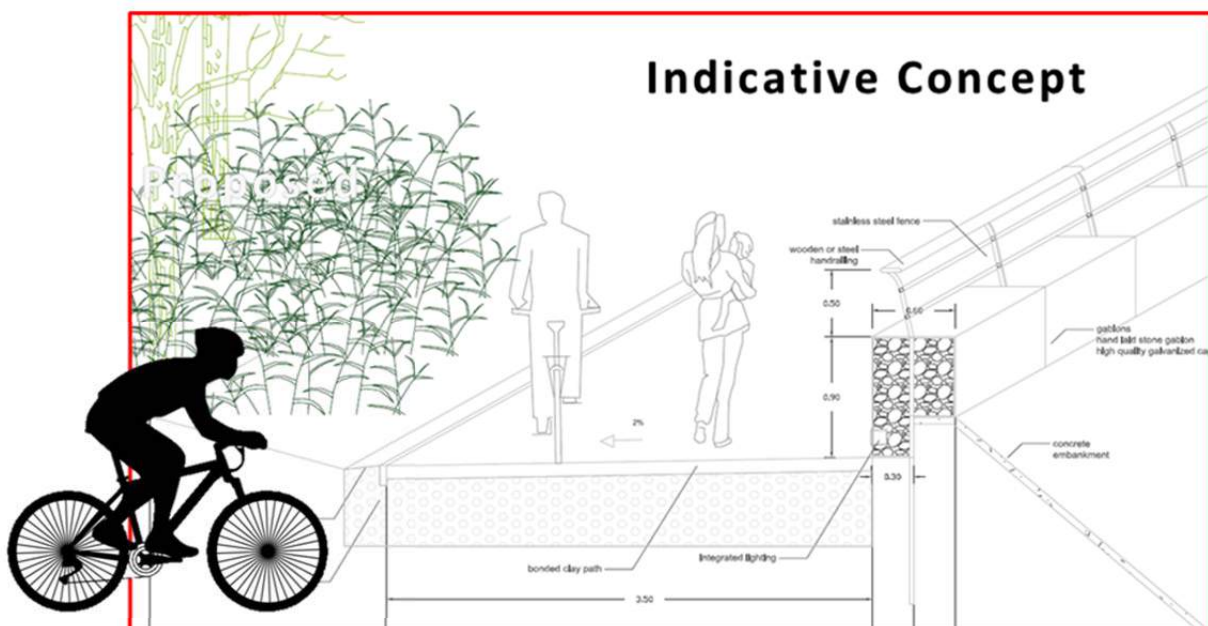
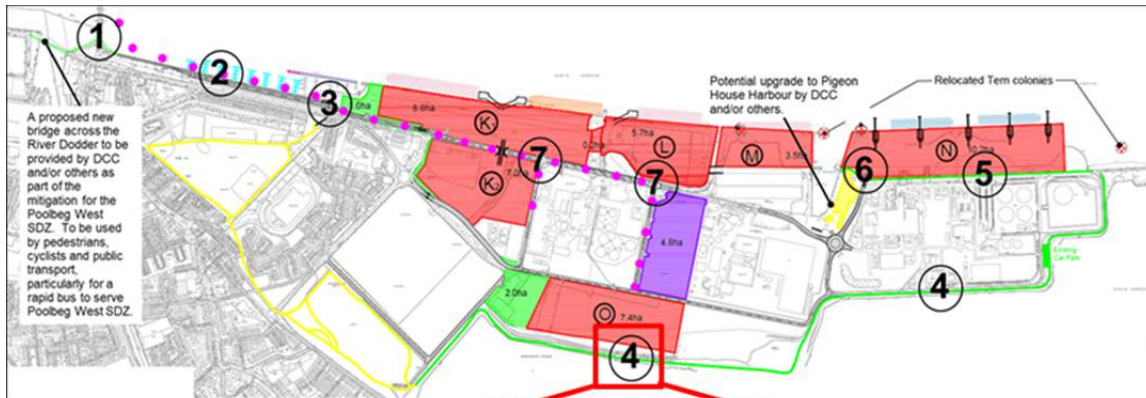
Southern Side 2: New Marina Walk to the north of the SPAR



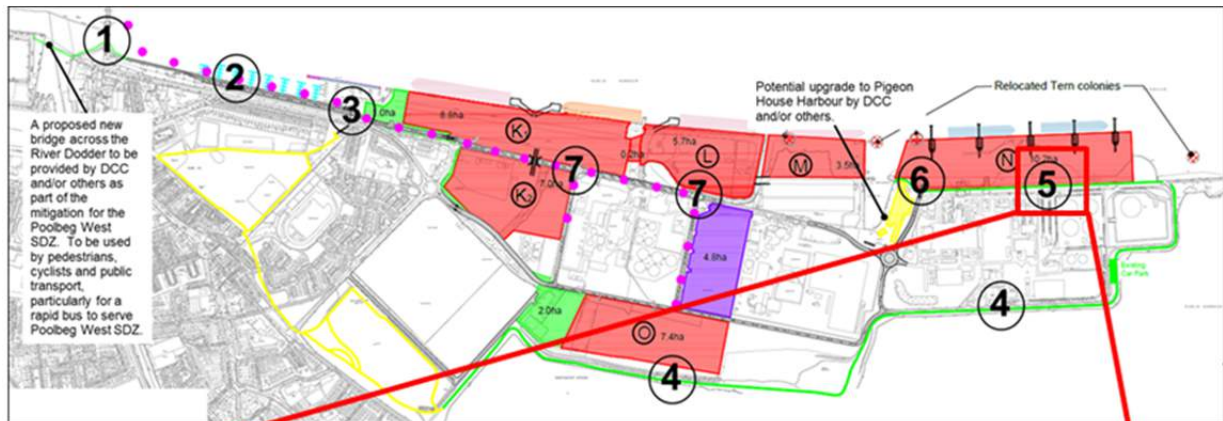
Southern Side 3: New Pedestrian / Cyclist Bridge over the R131 to connect the Marina Walk to Ringsend Park



Southern Side 4: Enhancement of the existing greenway along the Southern Fringe of the peninsula to improve connectivity to the Great South Wall



Southern Side 5: New southern amenity access route to Pigeon House Harbour and the Great South Wall



Southern Side: Potential upgrade to Pigeon House Harbour by DCC and/or others.

