RINGASKIDDY PORT REDEVELOPMENT

ENVIRONMENTAL IMPACT STATEMENT
VOLUME I: MAIN STATEMENT

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein.

ENVIRONMENTAL IMPACT STATEMENT
VOLUME I: MAIN STATEMENT

CONTENTS:

THIS PAGE IS INTENTIONALLY BLANK

1.0 INTRODUCTION, SCOPING & CONSULTATION

1.1 Project Summary

The Port of Cork (POC) has appointed a team of specialist consultants to compile an Environmental Impact Statement (EIS) of their redevelopment proposals at Ringaskiddy. A comprehensive description of development is included in Chapter 3 of this EIS.

1.2 Planning Context

Strategic infrastructure provisions contained within the Planning and Development (Strategic Infrastructure) Act 2006 came into effect on 31st January 2007. This Act, amending the Planning and Development Act 2000 (the 2000 Act) provides generally for certain planning applications relating to specified private and public strategic infrastructure developments to be made directly to An Bord Pleanála as opposed to the relevant local planning authority.

Through direct correspondence with An Bord Pleanála, this planning application was determined as Strategic Infrastructure development. This correspondence is contained within Volume III a - Appendix 1.1 of this Environmental Impact Statement (EIS).

1.3 Environmental Impact Assessment (EIA) - Concept

EIA is a key instrument of European Union environmental policy and a procedure required under the terms of European Union Directives 2011/92/EU (Consolidated EIA Directive) on assessment of the effects of certain public and private projects on the environment.

Article 2 of the Directive requires, inter alia, that "Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects." Article 8 requires that "The results of consultations and information gathered pursuant to [the EIA process] must be taken into consideration in the development consent procedure".

EIA requirements under domestic planning legislation have been consolidated, inter alia, into the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended).

1.4 Environmental Impact Statement - Structure

The EIS is comprised as follows:

- Non-Technical Summary
- Volume I - EIS: Main Statement
- Volume II - EIS: Figures & Photomontages
- Volume III a - EIS: Appendices
- Volume III b - Traffic & Transportation Appendices

The EIS should be read in conjunction with the associated planning submission to An Bord Pleanála including the planning application drawings. Where figures referenced in the chapters of this EIS are not located within the relevant chapter, they are provided in EIS Volume II. Where appendices are referenced in the Chapters of this EIS, they are provided in EIS Volume III a or III b.

The EIS comprises the following specific chapters:

- 01 – Introduction;
- 02 – Need for the Scheme & Outline of Alternatives;
- 03 – Project Description;
- 04 – Planning Policy;

- 05 – Human Beings;
- 06 – Cultural Heritage;
- 07 – Landscape and Visual;
- 08 – Traffic and Transportation;
- 09 – Noise and Vibration;
- 10 – Air Quality and Climate;
- 11 – Soils and Geology;
- 12 – Coastal Processes;
- 13 – Water Environment;
- 14 – Marine Ecology;
- 15 – Terrestrial Ecology and Ornithology;
- 16 – Interactions / Inter-Relationships;
- 17 – Schedule of Commitments.

1.5 Methodology

The EIS follows the format of the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Statements (March 2002). The EPA Advice Notes on Current Practices (in the preparation of Environmental Impact Statements) (September 2003) details the topics usually addressed for particular project types.

Whilst details of the methodology used in each individual discipline are given in the relevant Chapter of the document each EIA chapter broadly conforms to the following format:

- An Introduction describing the purpose of the Chapter;
- A description of the Methodology used in the Chapter;
- A description of the aspects of the Existing Environment relevant to the environmental topic under consideration;
- An assessment of the Impact (including cumulative) of the proposed development on the environmental topic;
- Recommendations for Mitigation measures to avoid, reduce or remedy where possible, any significant negative impacts identified; and
- An assessment of the Residual Impact which will remain assuming that the recommended mitigation measures are implemented.

1.6 Scoping & Consultation

1.6.1 Introduction

The Ringaskiddy Port Redevelopment project arises from a strategic need identified by POC as described in Chapter 2 of this EIS. The process of consultation has enabled POC to gauge opinions on general development options for the Port and facilitated differing perspectives to be taken into account in the initial stages of the development proposal. The consultation processes have helped to shape the proposal now being presented to An Bord Pleanála.

Building on the consultation carried out during the process to develop the POC Strategic Development Plan Review in 2010, POC has carried out further extensive consultation on the project in the course of developing the proposal. RPS has also consulted with various statutory and non-statutory bodies in preparing the EIS and this has facilitated changes to be made during the design stage of the redevelopment to take account of comments, and suggestions arising from the consultation process.

1.6.2 Consultation with An Bord Pleanála

A pre-application statutory consultation process was held with An Bord Pleanála relating to the proposed redevelopment. This occurred over a series of five pre-application consultation meetings between 2011 and 2014 on dates listed below.

Meeting	Date	Written record response
1	20th December 2011	8th March 2012
2	18th April 2012	5th February 2013
3	6th June 2013	11th July 2013
4	25th July 2013	9th September 2013
5	13th February 2014	7th March 2014

Copies of the written records of those consultations are included in Volume III a - Appendix 1.2. Following on from that process, the An Bord Pleanála served notice that it is of the opinion that the proposed redevelopment falls within the scope of paragraphs 37A(2)(a) and (b) of the 2000 Act and accordingly any application for permission for the proposed redevelopment must therefore be made directly to An Bord Pleanála under section 37E of the Act.

1.6.3 Informal EIA scoping exercise with statutory and relevant bodies

A significant level of consultation has taken place with statutory consultees and relevant bodies by both POC directly and RPS as part of the development of the Ringaskiddy Port Redevelopment proposals. Prior to the designation by An Bord Pleánala of the project as Strategic Infrastructure , RPS undertook a scoping exercise with the following organisations. These consultations have informed the nature of the development application. Letters were sent to the relevant statutory and non-statutory consultees listed below, informing them of the proposed development and inviting their comments on the proposal;

- An Taisce
- Arts Council
- Birdwatch Ireland
- Bord Gais Eireann
- Bord Iascaigh Mhara
- Commissioners of Irish Lights
- Cork City Council
- Cork County Council
  - County Manager
  - Planning
  - Environment
  - Water Services
  - Roads
  - Corporate, Community & Emergency Services
- Cork Kerry Tourism
- Department of Agriculture, Food and the Marine
- Department of Arts, Heritage and the Gaeltacht
  - Development Applications Unit
  - NPWS Divisional Ecologist
  - Underwater Archaeology Unit
- Department of Children and Youth Affairs
- Department of Communications, Energy and Natural Resources
- Department of Defence

- Department of Education and Skills
- Department of Environment, Community and Local Government
- Department of Foreign Affairs and Trade
- Department of Health
- Department of Jobs, Enterprise and Innovation
- Department of Justice and Equality
- Department of Transport, Tourism and Sport
- EirGrid
- Electricity Supply Board
- Enterprise Ireland
- Environmental Protection Agency
- Failte Ireland
- Geological Survey of Ireland
- Health and Safety Authority
- Health Service Executive – Southern Area
- Heritage Council
- Inland Fisheries Ireland
- Irish Federation of Sea Anglers
- Irish Whale and Dolphin Group
- Irish Wildlife Trust
- Marine Institute
- National Roads Authority
- Office of Public Works
- RNLI Ireland
- South West Regional Authority
- Sustainable Energy Authority for Ireland
- Teagasc

1.6.4 Public Consultation Exercise

A programme of public consultation concerning the Ringaskiddy Port Redevelopment project was undertaken between April 2013 and February 2014 to seek the views of the wider public on the proposal.

The consultation process involved;

- Briefings with local public representatives on the proposal
- Provision of up to date project information on the POC website: www.portofcork.ie
- The publication of public notices (see Volume III a – Appendix 1.3) in local newspapers

The 1st Public Consultation event was held as follows:

Fota Island Golf Clubhouse

- Thursday, 11th April 2013 (4-8pm)

Carrigaline Court Hotel

- Friday, 12th April (2-8pm)
- Saturday, 13th April (10am-2pm)

After the 1st Community Consultation, the project was redefined as described in Chapter 3 of this EIS. A second community consultation exercise was organised and occurred as follows –

Sirius Arts Centre, Cobh

- Thursday 6th February 2014 (3-8pm)

National Maritime College, Ringaskiddy

- Friday 7th February (3-8pm)
- Saturday 8th February (10am-2pm)

The purpose of the public consultation exercise was to inform people of the redevelopment proposals, record their views and ensure that they are aware of the opportunities available to them to participate in the development assessment process.

The redevelopment proposals advanced in the Ringaskiddy Port Redevelopment project reflect the significant levels of consultation that have taken place since 2010 on the future of the Port.

2.0 NEED FOR THE SCHEME AND ALTERNATIVES

2.1 Need for the Scheme

2.1.1 Policy Context

The provision of effective, efficient and competitive port facilities is essential to the economic vitality of the country and the South West Region. Ports are essential infrastructure and government policy is to ensure that infrastructure and port services are provided in time to meet changing market demands. Government policy is also to require port companies to fund all of their infrastructure and operational requirements from their own resources. Guaranteeing cost-efficiencies in terms of land use and operational activities is therefore a national policy obligation for the Port of Cork.

Ensuring that the Port of Cork continues to meet the external connectivity needs and supports the development of the wider regional and national economy is of key importance. This is clearly enunciated in Irish government policy, including the National Spatial Strategy, and the Government's most recent National Port's Policy statement (March 2013), discussed in more detail in Chapter 4 (Planning Policy). The National Port's Policy Statement identifies three Tier 1 Ports of National Significance, namely Dublin, Cork and Shannon / Foynes. The onus is primarily placed on Tier 1 Ports to deliver Ireland's required port capacity and services to contribute to overall national development goals.

Within Europe, the Port of Cork is identified as a Core Port within the Trans-European Transport Network (Ten-T) and improving its capacity and efficiency will contribute to the development of an integrated European transport network. The importance of the future development of the Port of Cork has been recognised at a European level by the awarding of a grant of €1.842 m. The grant supports the design and consent process for developing the Port of Cork; in line with the Port's 2010 Strategic Development Plan Review recommendations.

2.1.2 Economic Context

A report on the socio-economic impact of the proposed Ringaskiddy Port Redevelopment has been prepared by Indecon International Economic Consultants and is provided in EIS Volume III a - Appendix 2.1 (The Indecon Report).

The Indecon Report evidences that the Port of Cork plays a key strategic role in the development of both the Cork City region and the wider Irish economy. Furthermore, by facilitating the movement of goods to and from the UK and Continental Europe, the Port also plays an important role in the development of the EU's Internal Market. The Indecon Report emphasises that as a small open economy, Ireland is critically dependent on external trade to support its development.

The report also provides a detailed appraisal of the economic impact of the Port of the Cork trade on the regional and national economy. This is discussed in Chapter 5 (Human Beings) and EIS. In summary, the Indecon Report estimates the value of trade throughput at the port was €13.9 billion in 2012. It is estimated that this trade supported almost 172,000 full-time equivalent jobs across the regional and national economy.

2.1.3 Port of Cork Trade

The Port of Cork is one of two major national multi-modal ports and is the second largest port in the Republic in turnover terms. The Port of Cork's current facilities do not have sufficient capacity to accommodate the projected changes in freight throughput (detailed in the Indecon Report). To meet future operational requirements and to be consistent with national policy it is therefore necessary for the Port to plan for future growth requirements and to respond in particular to the trend towards larger vessels (see section 2.4.1).

As noted in the National Competitiveness Council's report 'Our Cities: Drivers of national Competiveness', April 2009:

> "*…in view of the long lead times for the delivery of air and sea port infrastructure and services, it is critically important that we plan now to ensure that our cities are well positioned to meet the longer term needs of business and citizens across the island*."

Consistent with this objective, the Port of Cork produced a review of its Strategic Development Plan in 2010. This review considered the Port's objectives; assessed the capacity of existing Port facilities; key drivers for future development; carried out a detailed appraisal of potential sites; and identified the most appropriate way forward to achieve a sustainable balance between the economic, social and environmental aspects of Port operations, while achieving an acceptable return on investments. It was concluded that it is most appropriate from a logistical, economic and planning context to phase out activity at Tivoli and the City Quays and relocate activities to other port locations. Section 2.6 details the site appraisal process carried out as part of the consideration of alternatives for the proposed Ringaskiddy redevelopment.

2.1.4 Key Drivers of Need for Project

2.1.4.1 Physical Constraints

The Port's current facilities at Tivoli and the City Quays are located in the Upper Harbour. The capacity of Tivoli to meet future trends in sea freight traffic is limited due to its location; the relatively narrow width and shallow depth of the harbour at these locations; the limited quay length; and the depth constraint of the Jack Lynch tunnel, which is down harbour of both facilities.

The trend in sea freight traffic is for larger vessels in both the bulk and container fleets, particularly container vessels. To remain competitive it is vital that the Port of Cork can accommodate these larger vessels. A graphical depiction of the trend in the size of vessels using Irish Ports since 1999 is presented in Figure 2.1. This highlights the steady growth in the proportion of overall vessel arrivals represented by ships with a capacity of 20,000 tonnes and above and a corresponding decline in smaller sized vessels. The presence of scale economies in container vessel usage is leading to a reduction in the volume of such vessels produced internationally, thereby removing smaller vessels from the market.

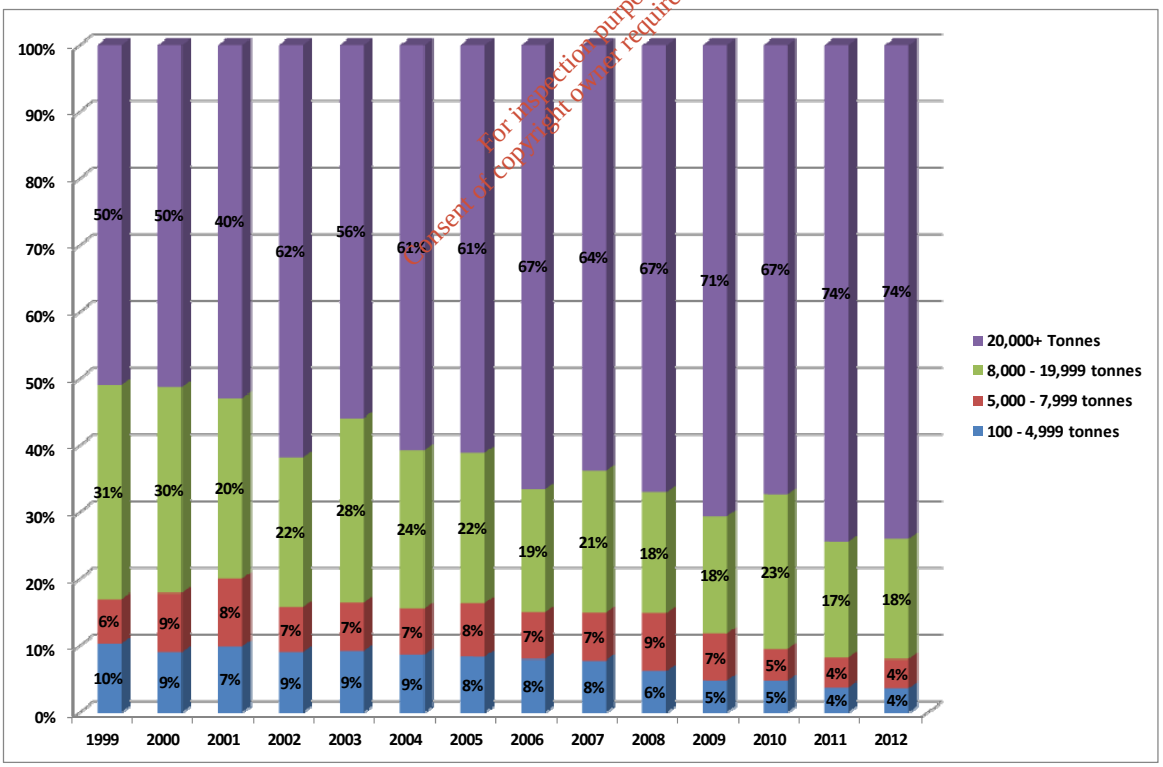


Figure 2.1 % Breakdown of Number of Vessel Arrivals by Size across Irish Ports

To remain competitive and effective, the Port of Cork must be able to accommodate larger vessels which are becoming the norm in the shipping trade. Accommodating larger vessels at Tivoli cannot be achieved because:

- Quay lengths are not sufficiently large enough to accommodate more than one large vessel at a time. The overall maximum combined length of container vessels that can be handled effectively at one time is 240 metres. While the mix of vessels currently serving the terminal fall within this dimension there have already been a number of occasions when this has been exceeded and delays have been experienced. As shipping trends continue to change the Tivoli container quay will become more unsuitable, with increased delays and consequential loss of competitiveness inevitable.
- The maintained depth in the approach channel to Tivoli is 6.5 metres, which means that only vessels with a draft[1] of less than 6 metres can navigate without restriction. Generally vessels with a draft greater than 7 metres will be subject to delays and are dependent on tidal flows to safely navigate the Upper Harbour. Depth can never be increased due to the presence of the Jack Lynch tunnel.
- Depth alongside at Tivoli is 6.9m Chart Datum[2] (CD) in the eastern berth and 8.8m CD in the western berth. Depending on the height of tide at low water, drafts at the eastern berth can be limited to approximately 6.3 metres. The trend is towards vessels with a draft in excess of 7 metres and a vessel at this draft could not lie afloat at all stages of the tide in the eastern berth.
- The turning circle at Tivoli is 160 metres in diameter, which allows vessels of up to 154 metres to turn. The turning circle cannot be increased as it is bounded on the north side by the quayside and on the south side by the Marina. A further limitation is that vessels greater than 135 metres in length cannot turn while there are other vessels on the berth. Figure 2.2 shows a container vessel 151 metres in length turning at Tivoli. A vessel of this size always requires a tug to berth at Tivoli, because it has to swing in the channel. Use of tugs for berthing is not part of normal container ship operations, but is the only way vessels of this size can be handled at Tivoli. If the Port of Cork cannot respond to changes in ship length and draft the Port will become uncompetitive and ultimately lose business to other Ports.

Figure 2.2: Container Ship turning at Tivoli

The physical constraints for the City Quays are less acute. For the City Quays the principal driver for relocation is to facilitate Docklands redevelopment and to improve logistical efficiencies in Port operations by consolidating activities.

2.1.4.2 Logistical Operations

Increased freight throughput has an associated increase in demand for back-up lands, both in terms of immediate storage and in terms of developing the ability to locate distribution activities close to the port site, thus maximising port-centric benefits. The trend in port logistical operations is to provide

[1] The draft of a vessel is the measurement from the waterline to the vessels lowest point beneath the water. The draft of a vessel will change depending on its loading.
[2] Chart Datum – the level of water that charted depths displayed on a nautical chart are measured from.

land banks adjacent to port facilities to promote these benefits, which cannot be adequately achieved in the Upper Harbour locations.

2.1.4.3 Regional Spatial Strategy

The spatial strategy for the South West Region and the Cork Metropolitan Area is to achieve critical mass in Cork City. The target is to grow the city population to 150,000 people by 2020. This is a very challenging objective as previous trends have seen a decline in the city population and from 2006 to 2011 the City population stagnated, with a slight decline of 0.4%. The release of port lands at the City Quays and Tivoli to facilitate the provision of high density, mixed use development, is fundamental to achieving the growth targets.

Any longer term proposals to intensify port activities at Tivoli or the City Quays are likely to be problematic, as they would not be consistent with the Cork City Plan or the wider regional spatial strategy. The relocation of port activities from both these locations is a strategic objective of the 2010 Regional Planning Guidelines; the 2009 Cork County Development Plan and the 2009 Cork City Development Plan.

2.1.4.4 Economic Benefits of Redevelopment

Based on growth projections detailed in Table 3.8 in the Indecon Report, it is estimated that if the proposed Ringaskiddy Redevelopment is completed, the overall value of trade handled by the Port of Cork would expand to €28.7 billion by 2033. This would translate into an increase in job numbers supported across the economy to over 354,000 FTEs by 2033.

The Indecon Report carried out a Cost-Benefit Appraisal of the proposed Ringaskiddy Redevelopment. This quantified the benefits and costs of proceeding with the project relative to a 'no-development' scenario. The analysis was informed by the trade throughput projections assuming (a) full implementation of the proposed capacity-enhancing measures for the Ringaksiddy site, and (b) no development of Ringaskiddy and 'business as usual' on the basis of intensification of the port's existing facilities and capacities. The Cost-Benefit Appraisal suggests that proceeding with the proposed Ringaskiddy Port Redevelopment would be likely to deliver a net economic return to the Irish economy, compared to a scenario where failure to develop the Port would result in over-capacity trade having to be diverted to other, more distant ports, with associated transport and environmental costs. Indecon's appraisal showed a Benefit-Cost Ratio of 2.31 to 1 in favour of proceeding with the proposed Ringaskiddy Port Redevelopment (see Table 5.10 of the Indecon Report).

2.1.4.5 Financing Future Development

Government policy requires port companies to fund all their infrastructural and operational requirements from their own funds. To comply with this requirement the Port Company must ensure that future logistical operations are cost-efficient and that capital land assets are properly managed and developed. It is not feasible to redevelop the Upper Harbour port sites to accommodate projected growth in Port trade, or the changing trends in the size of ships. The release of the lands in the Upper Harbour to provide for higher density inner city waterfront development would release capital to fund future port facilities in the longer term in the Lower Harbour, which are more suited to the developing trends in sea freight transport and port side logistics.

2.1.5 Summary of Need

Trade throughput at the Port of Cork is vital to the stability and future growth of the economy in the South West Region. The Port of Cork is also a vital contributor to the nation economy and European infrastructure network. It is essential that the Port responds to future growth requirements and changes in shipping trends towards larger vessels. The Port must remain competitive and respond to future economic demands to help sustain the regional and national economy. A Cost-Benefit appraisal carried out as part of the Indecon Report suggests that proceeding with the proposed Ringaskiddy Port Redevelopment would be likely to deliver a net economic return to the Irish economy, with a Benefit-Cost Ratio of 2.31 to 1 in favour of proceeding with the project.

The Port of Cork must relocate from the Upper Harbour because the depth of the water channel and width of the river at Tivoli cannot deal with larger vessels and it is logistically difficult to deal with more than 1 container vessel at a time.

The relocation of Port activities from the Upper Harbour, including City Quays, is also necessary to facilitate redevelopment of the Docklands and Tivoli for residential and employment uses. The City needs these lands to achieve its population growth targets and spatial planning objectives for the Region. Further the Port of Cork must release the equity of lands in the longer term in the Upper Harbour to fund their infrastructural and operational requirements, in line with Government policy.

2.2 Outline of Alternatives

2.2.1 The "Do Nothing" Scenario

The current physical constraints in handling some of the larger vessels simultaneously at the existing Tivoli Container Terminal and the critical operational difficulties associated with the projected further increase in container vessel size and cargo throughput confirms the Port of Cork's view that there is an urgent need to develop a new container terminal in deeper water.

A new facility will satisfy current and future customers' needs together with supporting local and regional business dependent on trade that passes through the port.

A failure to construct new deep water container berthing facilities to address the ongoing trend towards larger container vessels would place the Port of Cork at an operational and competitive disadvantage relative to other large ports. In such a situation the Port would start to lose trade and larger unitised freight customers, and over capacity trade would have to be handled at other more distant ports. In this scenario additional socio-economic costs would arise across the Irish economy associated with the internal haulage costs of moving trade, the majority of which would otherwise have an origin-destination catchment that is focussed on the Cork and Munster areas. These internal freight transport/connectivity costs would include additional journey times and vehicle costs, costs associated with increased traffic congestion along national primary routes and associated environmental/ emissions costs.

A failure to provide an extension to the existing Deepwater Berth (DWB) will impact the Port of Cork's ability to service the needs of the bulks sector and will inevitably lead to further operational difficulties due to berth congestion. In addition there would be negative impacts in that Dockland type development - in Tivoli and the City (a core regional objective) would be severely constrained

2.2.2 Alternative Locations

Various alternatives have been considered in the course of preparing plans for the proposed development. Alternatives have been considered in the context of the operational requirements of the port in establishing facilities to meet projected needs and the physical characteristics of alternative locations. This process has been informed by various previous studies including work undertaken during the preparation of the Port of Cork's Strategic Development Plan Review 2010 (SDP) and an assessment of the case for rail freight connectivity to the Port, Volume III a - Appendix 2.2.

2.2.2.1 Site Requirements

The drivers and factors which influenced choice of location included;

- Anticipated volumes of future trade
- Anticipated increase in vessel size
- Vessel characteristics and berth requirements
- Flexibility and future proofing

Key criteria which would need to be met for a site to be considered potentially suitable for port related development included;

- The site must provide access to deep water and have the potential to be deepened to at least -11m Chart Datum (CD)
- The site must be adequately sheltered from sea and weather conditions
- The site must be within reasonable distance of existing port locations to ensure effective communications and efficient operations

- The site must be geographically situated to ensure it is suitable to continue to service effectively the main areas associated with the Port of Cork's current operations and existing customer base
- The site must be able to be linked to main transportation networks
- The site must not represent a fundamental conflict with planning policy or environmentally sensitive designated areas

2.2.2.2 Greenfield Sites Outside Cork Harbour

A review of the coastline adjacent to Cork Harbour has indicated that this particular option is highly unlikely to be worthy of more detailed consideration for a number of reasons including;

- The generally unsuitable nature and topography of the coastline in the immediate vicinity of Cork
- Any areas not comprising unsuitable coastline are generally associated with residential or leisure use or have environmental/amenity value
- Sites outside Cork Harbour would be exposed to frequent and aggressive storm action during winter months and would require substantial engineering works in order to protect a commercial harbour from expected sea and weather conditions
- Such sites would be distant from other Port of Cork facilities
- Such areas would be increasingly distant from the areas and customers currently serviced by Port of Cork trade
- General lack of adequate road access to coastal locations

2.2.2.3 Port Facilities Elsewhere

Given the level of trade expected through the Port both in terms of containers, which may be relocated from Tivoli, and bulks and other trades which may be displaced from the City Quays any alternative location would need to be capable of accommodating a significant additional throughput. Any alternative existing port facilities will also need to meet fundamental requirements for water depth (11m CD) and length of quay and have flexibility for future development in order to continue to meet the ports needs in the future. The following existing port/harbour facilities are located within a 125km radius of Cork;

- Youghal
- Dungarvan
- Dunmore East
- Waterford Port
- Rosslare Port
- Wexford
- Kinsale
- Bantry Harbour
- Castletownbere
- Shannon Foynes Port

A review of these locations has concluded that there are no existing ports within the south/south-western geographical sector of Ireland that could realistically meet all of the requirements for the Port of Cork's relocation of existing and future trade in terms of;

- Physical capacity and access
- Customers needs and access to markets
- Commercial considerations
- Transport and Sustainability

2.2.2.4 Port locations and Greenfield sites within Cork Harbour

Based on an initial consideration of the fundamental criteria for a new port site a long list of potential locations within Cork Harbour worthy of further consideration was developed;

- Marino Point A (including Foaty Channel)
- Marino Point B (including Jetty and former IFI site)
- Cork Dockyard
- Ringaskiddy West, including lands to the west of the existing DWB and the location of existing ADM Jetty
- Ringaskiddy East comprising the east side of Ringaskiddy Basin and lands adjacent to Ringaskiddy Ferry Terminal
- Adjacent Haulbowline Island
- Cuskinny Bay
- Whitegate / East Channel
- Curlane Bank
- Dogsnose Bank
- Aghada / East Channel

Figure 2.3 Potential Locations in Cork Harbour

The sites in Figure 2.3 were assessed and scored with reference to a range of criteria which could influence any future development of port facilities. The main assessment categories used included;

- Physical Suitability
- Navigational Suitability
- Port Operations
- Road Transport
- Rail Transport
- Environmental Impacts including Ecology
- Planning Issues
- Cost

From this a shortlist of the five most suitable sites for each mode of trade was identified.

Rank	Containers	Bulk Solids/General Cargo
1	Marino Point B	ADM
2	Adjacent Ringaskiddy Ferry Terminal	Adjacent Ringaskiddy Ferry Terminal
3	East Side Ringaskiddy Basin	Marino Point B
4	Dogsnose Bank	East Side Ringaskiddy Basin
5	ADM	Dogsnose Bank

Subsequently a more detailed assessment of the short listed sites was undertaken and included the following main actions;

- Identification of the key features of the various trades which will need to be accommodated
- Preparation of conceptual development plans for how the anticipated future trade might be accommodated at the various sites either individually or together.
- Consideration of the sites under various assessment criteria

Key features of each of the shortlisted locations for unitised and bulk cargos is presented below:

Marino Point B

The Marino Point site occupies the existing lands associated with the former IFI plant. The area was extensively levelled for previous developments. The site includes an existing jetty which could potentially be re-used for other port activities. Access to the site from the jetty is currently restricted to a narrow single access viaduct and any future access may be restricted by the presence of a rock escarpment along the western (shore side) edge of the site. There is potential for reclamation of land between the existing jetty and shoreline.

Previous activity on the site would indicate that some degree of local contamination might be expected.

The site is sheltered but is subject to tidal currents of approximately 2 knots. The depth of the main navigation channel at Marino Point is generally greater than 10m but some dredging will be necessary at the quay line and also towards the western side of the channel to provide adequate depth for a turning basin.

Constraints to developing Port Facilities at Marino Point

Constraints to developing container and/or general cargo/bulk facilities at Marino Point include:

- The site is not owned by Port of Cork
- There is currently no Port of Cork activity at the site and so development at this location would not contribute to a consolidation of port operations
- The width of the existing jetty is 20m and with only one narrow existing access viaduct there could be a constraint on the ease of access for Heavy Goods Vehicles (HGV) due to limitations in respect of turning vehicles
- The existing rock escarpment could prove a constraint for access to and from the jetty and the distance from the jetty to the main site could limit operational effectiveness particularly in the case of containers
- The site is accessed by the R624 which has poor capacity and alignment issues and Belvelly Bridge, a heritage structure, is a major constraint. This road is not a designated National Route and it would need to be upgraded to accommodate port traffic. This site is situated directly south of the Great Island Channel cSAC, pNHA and a section of the Cork Harbour SPA. Disturbance to birds in the adjacent section of Cork Harbour SPA is likely to be the key (non-marine) ecological impact at Marino Point. Containers produce the highest overall levels of noise and the highest levels of 'impulsive' noise compared to bulk or bulk liquids and as a result disturbance to birds is more likely from container operations than for other trades
- Disturbance to birds is less likely with bulks operations
- Dredging which would be required at this site will straddle the main migratory channel for fisheries which will make timing of dredging activities critical for habitat disturbance and degradation due to dredging is the largest of any of the sites.

- There are potentially a large number of properties that may be negatively impacted by noise and emissions from the site. There is limited scope to screen from potential noise emissions to the west and south due to the open nature of the area crossing the river
- There is a potential at this location for negative noise impacts if container handling operations are required to be undertaken during night-time, particularly due to potentially impulsive noise associated with container handling operations
- The presence of cranes on the quayside could have a high visual impact. There would also be a high potential for significant visual impacts if reclamation is undertaken in front of the escarpment
- Marino House and the perimeter escarpment of Marino Point would have to be protected. Land reclamation on the foreshore adjoining the curtilage of Marino House would have impacts on this protected structure

Advantages to developing Port Facilities at Marino Point
Key advantages with regard to developing container and/or general cargo/bulk facilities at this location include:

- This site is generally reasonably good in terms of port operations. Vessel activity in the vicinity of the site is limited and there is unlikely to be significant conflict with other harbour users.
- Significant available existing lands that would meet the needs of all modes under consideration
- The site is adjacent to a rail line and the potential therefore exists for rail connectivity in the future. There was previously a railway siding onto the Marino Point site
- The main site is reasonably well screened by the escarpment and there is limited potential for visual impact on scenic routes
- Development at this site is consistent with broad planning policy objectives

Ringaskiddy East (Lands Adjacent Ringaskiddy Ferry Terminal)
This site largely comprises existing port lands adjacent to the facilities at the Ringaskiddy Ferry Terminal and close to the port facilities at Ringaskiddy DWB. Some limited reclamation would be required to provide quays at a location with adequate water depth but with this reclamation the site will be contiguous with existing port lands.

Any development will likely include both existing port lands (previously reclaimed) and new reclamation areas on the existing foreshore. The existing lands have been reclaimed for some considerable period of time and will be suitable for development of the types envisaged.

The site is well sheltered and there is direct access to the main channel and Ringaskiddy Basin. The site includes the existing Ringaskiddy pier and slipway.

Constraints to developing Port Facilities Adjacent Ringaskiddy Ferry Terminal
Constraints to developing container and/or general cargo/bulk facilities Adjacent Ringaskiddy Ferry Terminal include:

- Reclamation and construction of quays would likely have some impact on leisure craft sailing grounds
- Any development at this site which includes reclamation would most likely ultimately result in the loss of Ringaskiddy pier
- Some sections of the N28 serving the site already exceed capacity at peak times.
- There are no existing or disused railway lines in the vicinity of this site and as such the site is not suitable for rail connection
- The nearest section of Cork Harbour SPA is Monkstown Creek (also a pNHA) situated approximately 600m to the west of the site. Potential for disturbance of birds within Cork Harbour SPA is considered low to moderate
- The marine habitat in areas of potential reclamation and dredging is moderate to high quality fish nursery and fish feeding ground and is a good potting and netting area for commercial fishing
- There is limited scope to reduce potential noise emissions to sensitive receptors to the north in Blackpoint and Whitepoint

- There may be a potential for negative noise impacts at this location if container handling operations are required to be undertaken during night-time
- Land must be reclaimed from the sea to facilitate the ultimate development at this location. This will alter the coastline, and impact on the existing visual resource especially at locations across the harbour to the north and west
- For container development at this site the proposed density of containers will potentially have a consolidated and cumulative impact when viewed sporadically from Ringaskiddy to the south, and from coastal locations to the north and west especially. Quayside container cranes will constitute new, prominent vertical elements in the landscape. There is high potential for visual impacts on dwellings occupying higher slopes

Advantages to developing Port Facilities Adjacent Ringaskiddy Ferry Terminal

Advantages with regard to developing container and/or general cargo/bulk facilities at this location include;

- Site is in close proximity to the shore and with reclamation will be contiguous with existing Port lands. There are no significant infrastructural constraints to development
- There are no significant constraints to navigation at this location and there will be no significant impact on other commercial vessels
- Potential for future extension if required. This site has good potential for the phasing of developments
- This site would access directly onto the N28 National Road Network
- Potential for disturbance of birds within Cork Harbour SPA is considered low to moderate
- The site is less proximate to sensitive receptors than Marino Point with associated benefits in terms of noise impacts
- Air quality is unlikely to be a significant issue at this site given the relatively large distance to receptors
- Development at this site is broadly consistent with regional planning policy. Development would also be consistent with Cork County Development Plan (CDP) and local planning policy objectives
- This site would offer good degree of flexibility in terms of layout and phasing which would allow development proposals to respond to the potential fluctuations in economic growth of the Region

Dogsnose Bank

The site comprises open water in the vicinity of Dogsnose bank in the outer harbour. The entire site would be created by land reclamation in the shallow water adjacent to the main navigation channel. The development would require a causeway/bridge connection to the existing shoreline. This location provides for easy access to the main navigation channel although dredging would be required to ensure adequate water depth.

Constraints to developing Port Facilities at Dogsnose Bank

Constraints to developing container and/or general cargo/bulk facilities at Dognose Bank include:

- Site is more exposed to wave action from the mouth of the harbour than other sites under consideration and could be subject to some negative effects on harbour operations and ships at berth during storm events
- The site is in a location used by leisure craft and any development would result in a loss of sailing grounds
- Site is very remote from all other existing port locations and would not contribute to consolidation of port activities
- All traffic associated with a port development at this location would use the Regional Route R630. The R630 is a busy road and sections of the road already exceed capacity without any additional port related traffic. Any such additional port related traffic would have to route via a number of villages and residential areas such as Aghada, Rostellan, Saleen, and Ballinacurra. All traffic from a port development at this location would have to access the N25 at the Lakeview Roundabout which is congested at peak periods
- The use of this location would give rise to an additional mileage of approx. 80km per round trip

- There are no existing or disused railway lines in the vicinity of this site and as such the site is not suitable for rail connection
- The Whitegate Bay section of Cork Harbour SPA and Whitegate Bay pNHA lie approximately 500m to the east of the site. The equivalent section of Cork Harbour RAMSAR site is approximately 500m from the site
- Any development involving reclamation is likely to result in a loss of significant areas of the seabed habitat. Reclamation and the construction of an access causeway could possibly constitute a barrier to local fish movement and migration
- Any development involving the reclamation of lands from the sea will constitute a highly visible development from surrounding coastal landscapes regardless of proposed mitigation measures. Large cranes associated with loading and unloading containers will constitute new, prominent vertical elements in the landscape
- Possible impact on the triangle formed by the historic harbour forts, Spike, Camden and Carlisle which are of significant conservation value

Advantages to developing Port Facilities at Dogsnose Bank

Advantages with regard to developing container and/or general cargo/bulk facilities at Dogsnose Bank include;

- Extensive area is available for reclamation and as such sufficient area could be made available for all needs
- Navigation to and from this site would be relatively straightforward with no significant constraints
- The site is relatively isolated and well removed from noise sensitive receptors. There is a much lower density of residential properties located in proximity to the site, compared with the other sites
- This site is proposed within the open harbour and is not within a designated scenic landscape. The immediate coastal landscape to the southeast is however classified as scenic
- Air quality is unlikely to be a significant issue at this site given the relatively large distance to receptors

Ringaskiddy West

This site is located adjacent to the existing DWB and ADM Jetty. The extent of the site is constrained by the presence of the adjacent Monkstown Creek section of Cork Harbour SPA and Monkstown Creek pNHA to the north and the Ringaskiddy Basin to the south.

The site is mainly located on the existing foreshore and is occupied by the existing ADM Jetty structure.

The site is adjacent to the existing Ringaskiddy Basin and would provide for ready access to the main navigation channel via the entrance to the deep water basin although some dredging will be required to provide navigable water depth to new berths

Constraints to developing Port Facilities at Ringaskiddy West

Constraints to developing container and/or general cargo/bulk facilities include:

- Any extension of berthing quays beyond the training wall could have the potential to impact on tidal flows and this would need to be considered in detail
- There is a significant constraint on the back-up land available at the site and there would be insufficient space to accommodate all bulk and general cargo activities envisaged.
- Vehicle access to this site would need to be through the existing DWB hinterland area
- Some sections of the N28 already exceed capacity at peak times.
- There are no existing or disused railway lines in the vicinity of this site and as such the site is not suitable for rail connection
- The Monkstown Creek section of Cork Harbour SPA and Monkstown Creek pNHA are situated immediately adjacent to the west of the site. Potential for disturbance of birds within Cork Harbour SPA is considered high.

- There is limited scope to reduce potential noise emissions to areas to the north of the site but there would be greater potential to screen noise emission from the site towards Ringaskiddy
- There may be potential for negative noise impacts if cargo handling operations are required to be undertaken extensively during night-time

Advantages to developing Port Facilities at Ringaskiddy West

Advantages to developing container and/or general cargo/bulk facilities at this location include;

- The site is adjacent to the existing Ringaskiddy Basin and would provide for ready access to the main navigation channel via the entrance to the deep water basin. The site is very sheltered.
- Reclamation within the limits of the existing training wall would have little or no impact on the existing hydraulic regime
- Access to the Ringaskiddy Basin will be improved by removal of the existing ADM Jetty structure
- This site is adjacent to the existing DWB with established bulk solids and general cargo handling operations and development at this location would contribute significantly to consolidation of the port's bulks trade
- This site would access directly onto the N28
- Most of the reclamation associated with this site is on intertidal areas which are less productive for fisheries than reclamation areas associated with other sites
- The existing port activities in the area at the DWB establish a port related noise character for the area
- The presence of existing adjacent industrial buildings and infrastructure at this site will provide a backdrop to any proposed developments when viewed from the north, northeast and northwest. This surrounding infrastructure provides a precedent in the landscape for development of an industrial nature
- Development at this site is broadly consistent with regional planning policy. Development would also be consistent with CDP and local planning policy objectives
- A port facility at this location may have less impact on tourism and recreation than a similar development at the eastern side of Ringaskiddy Basin as it would not be as visible from Cobh and would not interfere with existing racing marks

2.2.2.5 Choice of Location

Based on a review and comparison of the shortlisted sites within Cork Harbour it is concluded that the primary location for the relocation of port activities from the upper harbour should be Ringaskiddy. This location is already associated with considerable port activity and port related development would be consistent with the CDP and Local and Regional Planning and Transportation policy objectives. Consolidation will have considerable benefits in terms of port operations and the relocation of both containers and bulks to this location will minimise the need to rely on more than one major road upgrade scheme.

A new dedicated container terminal would best be located at Ringaskiddy East on port lands adjacent to the Ringaskiddy Ferry Terminal with bulks and general cargo operations primarily being located at Ringaskiddy West adjacent the existing DWB and ADM Jetty.

Thus the works proposed under this application comprise the relocation of container operations from Tivoli and some initial accommodation of bulks at Ringaskiddy by the implementation of the following elements, and as described more comprehensively in Chapter 3 – Project Description.

- Container / multi-purpose berths and associated hinterland storage areas at Ringaskiddy East
- An extension to the existing DWB at Ringaskiddy West
- Improvements to internal roads and connection to public road network
- Provision of a new pier, slipway and amenity area at Paddy's Point

2.2.3 Layout Options for Container and Multi-Purpose Facilities at Ringaskiddy East

Having identified the site adjacent to Ringaskiddy Ferry Terminal as the most suitable location for container and possible Roll on Roll off (RoRo) activities, consideration has been given to what alternatives might be considered in the context of the facility layout and boundaries.

2.2.3.1 Berth Positions

The underlying principle behind the development of the container / multi-purpose berths and associated storage areas is to make the most efficient use possible of existing port lands.

The position of the berths is influenced by;

- The extent of existing land bank
- Proximity to deep water
- Avoidance of impacts on shipping access to existing facilities.

Taking the above constraints into consideration there is limited opportunity to consider alternative berth positions. Proposed positions provide access to deep water whilst maintaining a practical balance between dredging, reclamation and the most efficient use of existing lands.

2.2.3.2 Development Area and Internal Arrangement

The development area must cater for both container and RoRo trade to meet fundamental operations requirements;

- Container stacking
- Gate Operations
- Quay working areas
- RoRo vehicle parking including accompanied and unaccompanied traffic
- Maintenance and administration areas

With retention of existing activities including the Freight Compound, Ferry Passenger Terminal and trade car compounds there is very limited scope for consideration of alternative site boundary arrangements.

2.2.3.3 Ringaskiddy Pier and Slipway

The importance of Ringaskiddy Pier and slipway as an amenity is recognised and consideration was given to two alternatives;

- Retention of the pier in its current location and upgrading facilities – Whilst the main development area could be set out in such a way as to retain the pier, maintaining access to the pier location and providing enhanced facilities would represent a constraint on access to the terminal and for future internal port vehicle movements and access to other sites in the port lands. Having a such a public facility located in close proximity to operational port areas would also be unacceptable from a Health and Safety perspective
- Provision of replacement facilities – the provision of replacement facilities will enable more enhanced amenity value to be delivered by providing a dedicated leisure access to the waters of Cork Harbour. A new location must provide adequate access to navigable water depth, have sufficient area to provide amenity facilities and be within the ownership of Port of Cork to ensure deliverability. The current lands owned by Port of Cork at Paddy's Point are considered the most appropriate providing a suitable amenity area. Providing such facilities at this location would be consistent with the proposed IMERC development on the greater site landward of the proposed amenity area

2.2.4 Options for Upgrades to Port Access

Widespread consultations were held with both Cork County Council and the National Roads Authority in relation to the most suitable type of junction at the existing DWB entrance and two alternatives were considered;

- **Roundabout** – This option requires an elevation of the existing road levels in the vicinity of the entrance. A significant area is required for the roundabout with resultant knock-on effects in terms of geometry. A significant length of approach road (within the POC boundary) is needed to provide suitable approach gradients and this means the approach road must be aligned close to the existing ferry terminal dolphin structures which are used as nest sites by breeding terns

- **Signal Junction** – A signal junction is considered to provide the most appropriate solution for a number of reasons including;

    a. No requirement to significantly raise existing road levels
    b. Less land required
    c. Less constraints on approach geometry allowing internal roads to be moved further from nesting tern sites
    d. Improvements in junction capacity
    e. A signal junction is more suitable for accommodation of pedestrians and cyclists and as such will be more consistent with long term plans for the N28 to become a 'Green Corridor'

2.2.5 Layout Options for Development of Additional Bulk Cargo Facilities at Ringaskiddy West

The development of additional bulk cargo facilities can only practically be provided at Ringaskiddy West as a linear extension of the existing DWB which will ensure maximum efficiency in berth occupancy and the use of port equipment such as mobile cranes and hoppers.

As such there are no viable alternatives to the location of this additional berth.

Given the proximity of existing commercial sites it is anticipated that a closed form of structure will be most appropriate at this location, however final design solutions could comprise a combination of closed and open piled forms of structure.

2.2.6 Port Operation Options

2.2.6.1 Ringaskiddy East

Container and RoRo facilities being developed by Port of Cork will be required to maintain a degree of flexibility for a number of reasons;

a. The final port operator is not yet known. Port of Cork may operate the facilities or for example elements could be operated on a landlord model whereby the port company owns and manages the port facilities and infrastructure and leases them to private port operators, who provide the superstructure and equipment. The port operators, in turn, provide the container handling services to the port users. Other models may also be considered.
b. Elements of infrastructure may be implemented in a phased manner responding to specific market drivers
c. Variability in customer demands reacting to global shipping and trade trends

Various options have been considered for the method of container handling. These included;

1. ***Widespan Cranes (rail mounted)*** – This is the most efficient method of storage in terms of land area requirements but is the least flexible method of yard operation, providing for less opportunity to introduce equipment and infrastructure on a phased basis as needs dictate. Stacking would be up to 5 high and cranes would be served by terminal transporters.
2. ***Straddle carriers*** – Straddle carriers are more limited in the height to which containers can be stacked and as such are relatively inefficient in terms of land area required. The area required for the anticipated throughput is unlikely to be able to be provided on the land area currently available. Straddle carriers are typically diesel powered with associated noise levels.

3. Narrow span cranes (Rubber Tyre Gantry (RTG)) – The use of RTG's is popular for container handling, allowing stacking of containers to a reasonable height thus providing for reasonable efficiency in terms of land area required. The cranes can be electrically operated with associated noise benefits. Stacking would be up to 5 high and cranes would be served by terminal transporters. This type of operation is considered most appropriate for the proposed development, allowing accommodation of the anticipated throughput on the limited area available. This is also consistent with existing container operations on the DWB providing for optimisation in maintenance, servicing and spares.

2.2.6.2 Ringaskiddy West

As the proposed berth at Ringaskiddy West is a direct extension of the existing bulk handling facilities there is limited opportunity for the consideration of alternative methods of port operations as any operations on this new section would need to be consistent with similar operations on the existing bulks berths.

Various options for the handling of bulk materials on the entire DWB including the proposed extension have been reviewed. The use of closed conveyor systems on the DWB have been considered however there are a number of constraints to the implementation of this type of handling system;

- There are several individual operators on the DWB who would all have specific and not necessarily complementary requirements for an automated system. Any system would need to be able to service 3 receivers simultaneously
- At times there are split unloading operations with one ship discharging to two receiving companies at the same time. This would present problems if ship unloaders and common used conveyors were provided
- Whilst some of the current operators have considered future use of conveyors, one of the current storage buildings on the DWB is not designed to accommodate a conveyor system. Hence at least one operation would likely continue to use the current hopper and truck system of unloading
- The provision of fixed conveyor systems on the DWB could constrain the ability of the harbour to operate a multi-purpose facility, to mobilise large items of equipment and handle large cargoes due to potential headroom restrictions
- The high capital cost of providing sufficient quayside equipment and associated conveyors is prohibitive

Given these constraints it is the intention of the Port of Cork that the current method of handling cargoes be continued and extended to service the proposed berth extension. The Port will continue to adopt best practice and will actively review with the receiving companies what other measures might be implemented to control release of dust during unloading operations.

2.2.7 Rail Connection

In light of the refusal of the November 2007 application, Port of Cork commissioned an assessment of the case for rail freight connectivity to the Port (see Volume III a - Appendix 2.2). Subsequently in 2009 Port of Cork commissioned a review of the Strategic Development Plan which included an analysis of access onto the strategic national road network in the Cork Region and which incorporated the findings of the rail assessment.

In assessing whether any of the Port of Cork's customers could be served by rail, the assessment identified the following limitations:

- None of the Port's customers are connected to the railway. The Port's catchment is not well connected
- Customers are dispersed. Individual businesses generally do not generate sufficient volumes to form full trainloads, which Iarnród Éireann need to provide a freight service
- While distance need not be a limiting factor, lengths of haul to and from the Port of Cork are on the low side for rail freight operations
- The road haulage industry is highly competitive. Road and traffic conditions regionally are good

- The Loop Line at Kent Station would need to be retained if the Cork suburban line were to be used by freight (at the time of the study, Iarnród Éireann planned to remove it as part of site redevelopment proposals)
- Using existing wagons, 9 ft 6 in (2.85m) containers cannot pass through the Cork rail tunnel but this can be overcome with new rolling stock
- In Ireland, rail freight is limited to a few niche markets and accounts for a negligible proportion of overall traffic. Facilities are limited

It is thus concluded there is no socio-economic case for a rail operation to the Port of Cork under expected circumstances. Even at the Marino Point site, which is close to the railway, there is no robust case for a rail operation for transporting containers, although it is noted that the Port of Cork's SDP did conclude that Marino Point, if it can be acquired, would play a key role most likely in the bulk solid / bulk liquid area to meet the longer term port requirements. In particular it would provide the Port with a direct connection to the rail network for niche type "point to point" bulk cargos which the Port wishes to accommodate.

3.0 PROJECT DESCRIPTION

3.1 Introduction

This Chapter of the EIS describes the main components of the proposed redevelopment works at Ringaskiddy, Co Cork. Consideration is also given to construction activities associated with the works and operation and maintenance of the completed facilities. The proposed redevelopment is primarily located on or immediately adjacent to existing port lands in the vicinity of the existing port facilities at Ringaskiddy.

3.2 Proposed Development Works

The proposed redevelopment works comprise the following main construction elements;

Ringaskiddy East (*Container Berths and Multi-purpose Berth (CB/MPB)*

- A new 314m Container Berth 1/ Multipurpose Berth that will be capable of accommodating vessels carrying a range of different cargoes including containers, freight and general cargoes
- An additional 200m Container Berth 2
- Surfacing of existing port lands to provide operational areas
- Dredging of the seabed to a level of -13.0 m Chart Datum (CD)
- Demolition of existing link-span
- Installation of link-span comprising a floating pontoon and access bridge
- Installation of container handling cranes and terminal transport equipment
- Maintenance building, administrative buildings and entrance kiosks
- Ancillary car parking, lighting and fencing

Ringaskiddy West (Deepwater Berth Extension)

- A new 182m extension to the existing Deepwater Berth (DWB) which will comprise a filled quay structure extending no further seaward than the edge of the existing DWB
- Dredging works to varying levels to facilitate navigational access to the new facilities
- Lighting

Road Improvements

- Improvements to the external road entrance into the Ringaskiddy Deepwater Terminal and to Ringaskiddy West
- Improvements to the internal link road between Ringaskiddy East and Ringaskiddy West
- Road improvement works within the existing harbour lands at Ringaskiddy East
- Improvements to internal road network at Ringaskiddy East to facilitate future access to the N28
- Lighting and fencing

Paddy's Point Amenity Area

- Construction of a new public pier, slipway and boarding platform
- New planting and landscaping to provide public amenity area
- Boat storage, lighting and fencing

Figure 3.1 which is contained within EIS Volume II illustrates the complete extent of the proposed redevelopment works.

3.2.1 Ringaskiddy East

3.2.1.1 Proposed Port Operations

The proposed general arrangement at Ringaskiddy East is shown in Figure 3.2 which is contained within EIS Volume II.

Port operations will comprise three potential modes;

Lift on Lift off (LoLo)

LoLo operations will involve the loading/unloading of containers from vessels and temporary storage on the site before onward transport by road.

In a typical import cycle the Ship to Shore Gantry Crane (SSG) cranes are used to lift the containers from vessels berthing alongside the new quays. The cranes then place the containers onto trailers/tractor units which transport the containers to the onsite container stacks. Electrically operated Rubber Tyred Gantry (RTG) cranes are used for the handling of containers in the main stacks. These cranes lift the containers into the stack and at a later time facilitate onward transport of the containers by transferring to road going Heavy Goods Vehciles (HGVs). In an export cycle the above mentioned process is reversed.

Each container stack is orientated perpendicular to the CB/MPB and is 7 containers in width with a vehicle lane being provided beneath the RTG's. In the early stages of use harbour mobile cranes may also be used for ship unloading. Containers will be stacked at an approximate height of 5 containers high, equivalent to 12.8m.

At the end of each main stack is a gantry where refrigerated containers, otherwise known as reefers, can be powered and stored. Hazardous container storage facilities are accommodated within the main stacks.

General Cargo Operations

The general cargo area will initially be used to accommodate general break bulk and project cargoes. Materials will generally be stored in the open and no storage buildings are proposed. Generally the maximum height of stored materials will be approximately 5.5m.

Cargo will generally be lifted from vessels using a mobile harbour crane or SSG and will then either be placed directly into the storage area or will be placed on the quayside for onward movement and stacking by internal port equipment such as reach stackers.

Roll on Roll off (RoRo) Operations

The RoRo ramp, once installed will be used to allow direct access by freight HGV traffic to vessels with suitable vehicle loading ramps. Freight traffic may comprise two different types;

Unaccompanied - in this mode the freight trailers are transported on and off the vessel by dedicated port transport tractor units. The trailers are then stored in the port area where they are subsequently collected by road going lorries.

Accompanied – in this mode each trailer on the vessel is accompanied by a road going freight tractor unit. On disembarkation these vehicle will drive directly onto the public road network without being temporarily stored in the port area. During embarkation such vehicles will marshal at the port shortly before the vessel is due to depart.

3.2.1.2 Quay Structures

Container Berth 1 will be constructed along the western edge of the existing area of reclaimed land. The quay has been positioned to provide adequate width of berth slot without impinging on the existing

deepwater basin navigable space. Provision is also given to the construction of a landing area and linkspan in order to accommodate RoRo freight operations.

An additional berth is provided as an extension to the Container Berth 1 and is aligned to coincide with the shape of the existing reclaimed land. This second quay will be primarily used for port container traffic.

The new berthing facilities will comprise a concrete deck surface supported on steel/concrete piles. It is anticipated that the new quay wall will comprise a vertical steel wall tied to a sheet piled anchor wall The main wall will likely comprise a combi-wall form of construction which involves the installation of intermittent tubular steel piles with traditional steel piles infilling between the main piles although other forms of construction such as open piled, or a combination of open piled and closed structures could be used.

The berthing face to the quay structure will be formed by the installation of a reinforced concrete capping beam which will also be used to support the seaward leg of the main quayside container handling SSG cranes. The concrete capping beam will extend to approximately Mean Low Water Springs (MLWS) and will provide a smooth berthing face.

Plate 3.1 illustrates a Combi-wall form of quay construction.

Plate 3.1 Example of Combi-wall Under Construction

The quay will be provided with collection facilities for surface water which will be discharged to sea after passing through an oil and silt interceptor. The quay will also be provided with necessary services including power outlets, lighting and water.

Quay construction may be undertaken either by traditional construction contract or on a design and build basis where the contractor undertakes the final detailed design within certain parameters/requirements specified by Port of Cork.

3.2.1.3 Reclamation Works

The main container terminal area is largely located on existing reclaimed lands and new reclamation as part of these works will be limited to a small area (0.5ha) immediately behind the quay walls.

It is anticipated that suitable fill material will be imported from local land sources.

3.2.1.4 Demolition

Internal roads improvement works will require the removal of the existing ferry terminal No 2 link span which is no longer in use.

3.2.1.5 Dredging

Dredging works will be carried out to -13.0m CD adjacent to the new quay structures to provide sufficient water depths for vessels at all stages of the tide.

Bed conditions comprise uncompacted silts overlying gravel, clay and limestone depending on location. Dredging will be required in all materials including bedrock.

The soft overlying silt material is unsuitable for use in the works and therefore this will be removed, either by backhoe or trailing suction hopper dredger, and disposed of at a sea disposal site. The quantity involved is in the order of 90,000m³. The disposal of the dredged material will require application for a Dumping at Sea Permit from the Environmental Protection Agency, which is subject to a separate consenting process.

Bedrock and other hard strata will most likely be removed by a combination of drilling and blasting, and / or the use of use of mechanical plant working from a floating or jack-up barge. Typical floating plant is illustrated in Plate 3.2. Dredged rock and other suitable material will be re-used in the reclamation works. The total volume of rock to be removed is anticipated to be in the order of 47,000m³. Further detailed site investigations will be carried out prior to dredging to confirm the precise volume of rock to be removed.

3.2.1.6 Surfacing

The container terminal area will be surfaced using a combination of concrete slabs and bituminous surfacing or block paving for trafficked areas. A series of piled concrete runway beams will be installed along the edges of each container stack in order to provide lanes along which the RTG cranes can operate.

The general cargo / RoRo storage area will generally be surfaced using bituminous surfacing.

3.2.1.7 Linkspan

The CB/MPB will be provided with a floating linkspan to facilitate RoRo traffic. The linkspan will comprise a floating pontoon of steel construction which will rise and fall with variations in tidal level, maintaining a constant freeboard above water level. Vehicular access to the linkspan pontoon will be via a ramp structure the upper end of which will be fixed to the quay structure with the lower end resting on the pontoon. A linkspan pontoon arrangement is illustrated in Plate 3.3.

Plate 3.2 Mechanical Excavator on Floating Plant

Plate 3.3 Typical Linkspan

3.2.1.8 Container Terminal Buildings

A total of 3 new structures will be provided within the development area, as follows:

- Two new portacabin offices will house port administration staff, welfare facilities and other ancillary activities. Each office is likely to comprise a small two storey building of pre-fabricated construction, approximately 5.15m high x 3.80m wide x 12.2m long. Staff car parking will be provided immediately adjacent to the administration building
- A maintenance building will also be provided for the maintenance and repair of terminal equipment and other port infrastructure. The size of this building is approximately 7.82m high x 18.2m wide x 20.5m long
- Security kiosks and associated canopies will be provided at the entrance and exit gates.

The location and size of these buildings are illustrated on the planning application drawings.

3.2.1.9 Services and Security

The Container Terminal will be provided with the following services and security features.

Foul and Storm Water Drainage

Separate foul and storm drainage systems will be installed within the development sites.

Port of Cork has been actively consulting with Cork County Council with respect to the Council's proposal to upgrade the existing sewer systems and to install a new pumping station in Ringaskiddy as part of the Lower Harbour Main Drainage Scheme. The latest feedback from these consultations is that the Lower Harbour Main Drainage Scheme will be completed by the end of 2015.

Given that the proposed construction works for the Ringaskiddy Port Redevelopment project are scheduled to commence in 2016, with a view to having the new facilities operational in 2018, It is intended that foul sewage from the proposed buildings (maintenance building and new portacabin offices) will be discharged directly into the upgraded Council sewer system. It is also anticipated that foul drainage from existing port facilities will be diverted to the new system.

Should the proposed sewer upgrade works not proceed as intended or occur beyond the timescales indicated, then the Port of Cork will install a new package treatment works on the site in order to dispose of sewage from the proposed redevelopment. The plant will treat to a standard approved by Cork County Council of 30 mg/l SS and 20 mg/l BOD prior to discharge to a soakaway.

Storm water runoff from the site will be collected in a dedicated storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to the harbour waters via a series of silt traps and oil interceptors.

Mechanical and Electrical Services

The proposed lighting for the general working areas will comprise high mast lighting, details of which will be subject to detailed design. Roadway lighting will comprise standard road lighting columns and lights. Lighting will be designed to provide an average lighting level of 20 Lux for roadways, 50-100 Lux for quayside areas and 30-50 Lux for storage and circulation areas.

Due to operational reasons the container stacking and quay working areas will not be provided with lighting masts. These areas will be illuminated by working lights fitted to the various cranes working in the terminal area which illuminate the area in the immediate vicinity of the particular crane. Illumination levels in the working area under the cranes will be 100-200 Lux.

The lighting will be designed to prevent direct glare into surrounding properties and illumination of the night sky.

Power supply will be by connection to the local electricity grid system.

Water supply will be by connection to the local mains system.

Fencing and Security

Palisade fencing will be provided around the entire landward perimeter of the Container Terminal to comply with the requirements of the International Ship and Port facility Security Code (ISPS). Security gates will be positioned at the entrance and exit of the main CB/MPB terminal.

CCTV cameras will be installed within the CB/MPB.

Safety Equipment

All quayside areas will be provided with mooring bollards, ladders and safety chains in accordance with the requirements of BS6349 Code of Practice for Maritime Structures.

Fire hydrants will be provided at regular intervals in all working and storage areas.

Navigation

In order to accommodate the proposed works there will be some amendments to the existing navigation markers which shall be carried out in conjunction with the Harbour Master. The relevant changes are illustrated on the planning application drawings.

Navigation simulations have been carried out by Port of Cork pilots and personnel from the Harbour Masters department to confirm the proposed quay can be accessed in a safe and efficient manner.

3.2.2 Ringaskiddy West - Deepwater Berth Extension

The proposed general arrangement at the new DWB extension is illustrated in Figure 3.3 which is contained within EIS Volume II.

3.2.2.1 Proposed Port Operations

The new berth extension will be primarily used for the importation of bulk materials such as animal feeds and fertilisers, and general cargoes.

Port operations on this new berth will be similar to those currently carried out on the existing DWB. Harbour mobile cranes will be used for cargo handling with loose bulk materials being lifted using a grab bucket and deposited via hoppers into awaiting lorries. The materials will then be transferred into bulk stores situated in the existing hinterland areas.

The imported goods are stored until such time when collection is arranged and lorries distribute the cargoes using the local and national road networks. Depending on demand for a particular cargo, there will also be times when the imported materials will be deposited directly onto lorries waiting nearby the quayside for distribution.

Handling of general cargo and specialist project cargoes will be carried out by harbour Mobile Cranes, on the quayside from where they will be transferred to the port hinterland using reach stackers and / or terminal transport vehicles.

3.2.2.2 Quay Structures

The length of the new extension is 182m. Given the proximity of existing commercial sites it is anticipated that a closed form of structure will be most appropriate at this location, however final design solutions could comprise a combination of closed and open piled forms of structure.

3.2.2.3 Reclamation Works

Approximately 0.8ha of new land will be created as part of the works. The vast majority of the material arising from the proposed dredging works will be unsuitable for use in the reclamation works and as such it is anticipated that suitable fill material will need to be imported from local quarried sources.

3.2.2.4 Dredging

Dredging works will be carried out to -13.4m CD at the new berth slot in order to maintain a consistent water depth with the existing DWB. The approach to the berths will be dredged to -11.75m CD.

Bed conditions are similar to that in Ringaskiddy East however rock levels are deeper which will mean that no rock dredging will be required as part of the proposed dredging works. Dredging to the required depths will therefore either be by backhoe or trailing suction hopper dredger, and disposed of at a sea disposal site. Again, the disposal of the dredged material will require application for a Dumping at Sea Permit from the Environmental Protection Agency. Excavation of approximately 215,000m^3 of material is estimated.

3.2.2.5 Services and Security

The new DWB will be provided with services and drainage similar to that used on the existing berth. All drainage will be connected to the existing drainage system on the DWB.

3.2.3 Road Improvements

New road improvement works are proposed in order to provide better access to Ringaskiddy East and West.

A new signalised access is proposed at the western connection to the N28 (at the junction of the N28 and R613) which will act as the main entrance to the port in the short term.

In the longer term it is anticipated that a new eastern connection to the N28 will be provided at the eastern side of Ringaskiddy village. Internal road improvements to facilitate connection to such a new junction are included in the scope of works.

A new internal port link road is proposed which will connect Ringaskiddy East and Ringaskiddy West. Some limited reclamation and new revetments are required to accommodate the new access road as it passes behind the existing ferry berth. A left hand turning lane will also be provided from the N28 which will form the new access to the DWB.

In the event that the new N28 terminates at the R613 (Barnahely) then the western connection to the N28 will continue to act as the main port entrance in the longer term. Should this be the case then this junction will be expanded as indicated on the planning application drawings. The main upgrade in this case is the addition of 2 further lanes to the internal port link road. Both options for the western entrance are illustrated on the planning application drawings. It is anticipated that the final N28 route details will be confirmed prior to commencement of the Ringaskiddy Port Redevelopment by Cork County Council thus allowing final determination of entrance details prior to construction.

The arrangement of the proposed road improvements are illustrated in Figure 3.4 which is contained within EIS Volume II.

3.2.4 Amenity Area at Paddy's Point

The existing Ringaskiddy Pier will be retained in use by Port of Cork however public access will not be possible given that it will coincide with the entrance and exit gates to the Container Terminal. It is therefore proposed that a replacement pier and slipway will be constructed on Port lands at Paddy's Point.

The proposed general arrangement of the new facility is illustrated in Figure 3.5 which is contained within EIS Volume II.

The pier and slipway will comprise concrete decks on concrete or tubular steel piles.

An amenity area will be provided adjacent to the pier providing parking and associated amenity facilities such as:

- New planting and landscaping to provide new public amenity area
- New pedestrian circulation routes
- Boat Storage

The construction of the amenity area will include some reclamation on the foreshore using imported fill which will be protected at the edges by rock armoured revetments.

3.3 Terminal Operations Equipment

The details and approximate dimensions of the types of equipment anticipated to be used in port operations associated with the proposed works are described in the following sections. Precise dimensions will vary from manufacturer to manufacturer and final dimensions will only be determined when the supplier of the equipment has been identified. Dimensions considered in preparation of this EIS are based on typical dimensions of equipment currently available in the marketplace.

Equipment may be installed in a number of phases up to those numbers indicated on the planning application drawings.

3.3.1 Ringaskiddy East

The Container Terminal will be provided with various items of equipment for the handling and movement of containers and other cargo.

A list of probable terminal equipment is listed below.

Ship to Shore Gantry Cranes	-	2 nr
Rubber Tyred Gantry Cranes	-	6 nr
Harbour Mobile Cranes		1 nr
Terminal Tractors	-	12 nr
Reach Stackers		2 nr

3.3.1.1 Ship to Shore Gantry Cranes

SSG cranes as illustrated in Plate 3.4 are used to transfer containers to and from ships and are located on the quayside. The final size of cranes will be determined by the terminal operator however the maximum size anticipated would have the capacity to service vessels up to 13 containers in width.

Typical maximum overall heights/dimensions for a crane of this capacity are summarised in Table 3.2, although the final dimensions may be smaller.

Table 3.2 Typical Ship to Shore Crane Dimensions

Height to underside Jib (m)	Height to Apex (m)	Overall height with Jib raised (m)
Approx 37m	Approx 65.5m	Approx 89m

Plate 3.4 Typical Rail Mounted Ship to Shore Crane

3.3.1.2 Rubber Tyred Gantry Cranes

Electrically powered RTG cranes are generally of short span and in this case are anticipated to accommodate 7 containers and a vehicle lane between the legs. A typical height for this type of crane would be in the order of 23m.

Typical photographs of RTG yard cranes are illustrated in Plates 3.5 and 3.6.

Plate 3.5 Typical RTG Yard Crane

Plate 3.6 Typical RTG Yard Crane

3.3.1.3 Yard Transport

Terminal Tractors

Containers will generally be transported to and from the stack using terminal tractors. These are basically similar to a normal HGV tractor unit. A typical unit is illustrated in Plate 3.7.

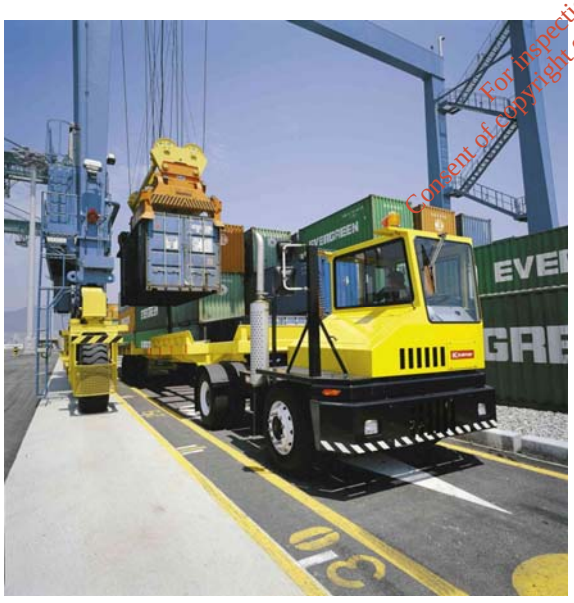


Plate 3.7 Typical Terminal Tractor

Reach Stacker

Reach stackers are front lifting items of equipment which use telescopic arms to place containers at height in stacks. This type of equipment will be used in the CB/MPB area to handle containers. They will also be used in the main container terminal to move and handle empty containers. A typical unit is illustrated in Plate 3.8.

Plate 3.8 Typical Reach Stacker

3.3.2 Ringaskiddy West – Extension to Deepwater Berth

Operations at the DWB extension will be similar to those currently undertaken on the existing DWB.

Ship to shore operations will be undertaken by harbour Mobile Cranes with cargo being transferred to mobile hoppers discharging into HGV's for transport to onsite storage facilities or directly offsite.

A typical harbour mobile crane is illustrated in Plate 3.9.

Plate 3.9 Typical Harbour Mobile Crane

3.4 Phased Implementation

The various elements of infrastructure proposed may be implemented in a single construction or alternatively they may be implemented in a number of phases as a result of trade demands, port operational requirements and funding.

It is anticipated that a phased implementation is likely to comprise three main elements as listed below and illustrated in Figure 3.6 which is contained within EIS Volume II.

Phase 1 – Ringaskiddy East comprising;

(a) Improvements to existing port entrance adjacent to existing DWB entrance
(b) Pier, slipway and amenity area at Paddy's Point
(c) Elements of internal road improvements to facilitate access to Ringaskiddy East
(d) Construction of the CB/MPB and associated container storage and handling areas
(e) Additional Internal Roads to facilitate connection to new N28, when constructed, at eastern end of port complex / Ringaskiddy Village

Phase 2 – Ringaskiddy West comprising the extension to the existing DWB

Phase 3 – Ringaskiddy East comprising additional quay wall and floating linkspan to accommodate RoRo traffic at the CB/MPB. This facility will not be brought into commission for accompanied RoRo freight traffic until the new N28 is in place and operational.

3.5 Construction Activities

3.5.1 Programme

As indicated in section 3.4 the construction of the proposed works may be undertaken in a number of phases. It is estimated that the construction period for Ringaskiddy East will be approximately 24 months.

Construction of the DWB extension at Ringaskiddy West is anticipated to require approximately 11 months. It is not anticipated that this element will be constructed concurrently with Ringaskiddy East.

3.5.2 Temporary Site Compound

An area will be required for the establishment of the Contractor's site compound. The site compound will be used for the Contractor's site office accommodation and facilities and will include an area for temporary storage of construction materials.

At Ringaskiddy East the extent of the site is such that the contractor will be able to establish facilities within the immediate site area. Should further areas be required then the existing freight compound could be made available.

At Ringaskiddy West an area for a site compound will be made available in the area immediately behind the proposed works / existing DWB as indicated in Figure 3.7 which is contained within EIS Volume II.

3.5.3 Site Access

Existing port operations will continue as normal during the construction period.

Suitable traffic management and other systems will be put in place as required to minimise disruption to existing activities during the construction period. These will include:

- Upgrade of the existing DWB entrance prior to major construction works being undertaken.
- Segregation of entrances
- Suitable restrictions on timing of deliveries to avoid peak traffic periods
- Preparation of a detailed traffic management plan for the construction phase

3.5.4 Pollution Control

Pollution control measures will be put in place during the construction period as described in Chapter 13 of this EIS.

3.5.6 Site Safety

The works will be subject to the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction) Regulations, 2013. All aspects of design construction will be reviewed with regard to health and safety and a risk assessment will be carried out. A project supervisor (design phase) will be appointed to produce a pre-tender Health and Safety Plan for the project. The principal contractor will be responsible for the control and co-ordination of health and safety during the works and will be appointed as the project supervisor (construction stage).

3.5.7 Waste Disposal

Contractors working on site during the works will be responsible for the collection, control and disposal of all wastes generated by the works. An indication of the types of waste likely to be generated by the works and the most appropriate method of disposal are presented in Table 3.3.

Table 3.3 Typical Wastes Generated by the Construction Works

Activity	Waste Generated	Disposal/Treatment Recommendations
General Construction Waste	Waste oils	Collected by waste recycling contractor.
	Other waste	Collected in skips for disposal by licensed waste contractor.
General Office/Messing	Paper, packaging, canteen etc.	Collected in covered skips/large bins for disposal by a licensed waste contractor.
Temporary Site Toilets	Sewage	Emptied under contract for disposal at an appropriate facility.

3.6 Operational Activities

3.6.1 Maintenance

When construction work has been completed, the quays and revetments will require little by way of maintenance.

Although some siltation may occur in the new dredged areas the water depth is such that this is unlikely to cause any significant problem in the short term. Any maintenance dredging which may be required in the longer term will be carried out as part of the Port of Cork's regular maintenance dredging programme. The material generated would likely be disposed of at sea at a licensed disposal site agreed in accordance with Port of Cork's maintenance dredging licence.

3.6.2 Pollution Control

Surface water from the main quay and working areas will be collected by a system of drainage channels and gullies. The surface water will be discharged to sea via oil and sludge interceptors to ensure that no pollution is released into the harbour or surrounding waters.

Sewage disposal from the proposed buildings will be by connection to the proposed Lower Harbour Drainage Scheme, or if this is not in place by package treatment works and discharge to a soakaway system.

3.6.3 Waste Disposal from Vessels

Port of Cork operates an Environmental Management System (EMS) which includes procedures for the disposal of waste from berthed vessels.

All waste to be disposed of from berthed vessels will be handled and disposed by a licensed waste disposal contractor. Waste awaiting disposal will not be permitted to be stored on the quayside.

Discharges from vessels to the harbour waters will not be permitted.

3.7 Construction and Operational Phase Mitigation

Various environmental mitigation measures will be implemented in both the construction and operational phases as detailed in Chapter 17 of this EIS.

4.0 PLANNING POLICY

4.1 European Policy – Trans-European Transport Network (TEN-T)

In 2011 the European Commission adopted a proposal to transform the existing patchwork of European roads, railways, airports and canals into a unified transport network (TEN-T). The policy sets an objective to establish a core transport network by 2030 to act as the backbone for transportation within the Single market:

> "*The aim is to ensure that progressively, and by 2050, the great majority of Europe's citizens and businesses will be no more than 30 minutes travel time from this comprehensive network*." (Memo/11/706)

TEN-T policy aims to ensure the free-flow of goods and people to support growth, jobs and EU competitiveness. The comprehensive network includes components for all transport modes – rail, road, inland waterway, air and maritime, as well as their connecting points and corresponding traffic information and management systems.

The core network represents the strategically most important nodes within TEN-T, which link the overall trans-European network. Core network links are identified as being of the highest importance for long-distance traffic and to play a strategic role for the development of the TEN-T.

The 2011 Planning Methodology for the TEN-T notes that in countries where railways exist, hinterland connections of ports within the core network should include both road and rail. However it also notes that there may be exceptions to the principle of multimodality, if the required measure would not be economically viable or environmentally sustainable and notes that:

> "*There may be links which comprise only road or rail*." (2011 Planning Methodology for TEN-T, p.7)

The Port of Cork has been identified by the European Commission as a future TEN-T core network port and as playing:

> "…*a key strategic role in the movement of goods to and from the UK and Continental Europe. Ensuring that the Port meets future connectivity needs and supports the development of the wider regional and national economy is of key importance*." (TEN-T 2012 Annual Call, p.66)

The Port of Cork's application for grant assistance under the 2012 Annual TEN-T Work Programme was successful, with an award of €1.842m toward 'Studies to secure building permits and to prepare design and tender documentation to facilitate the implementation of the priority projects identified in the Port of Cork Company's Strategic Development Plan Review 2010 (SDP).

The application was made under Priority No. 1 i.e. "The Acceleration / Facilitation for the implementation of TEN-T projects". This priority addresses activities alleviating bottle-necks and / or promoting cross-border connectivity and network effects at European level with the aim to create a mature project pipeline for 2014 and beyond.

In evaluating the grant application the European Commission noted that the Port of Cork's proposed action is highly relevant to the call for proposals and stated that:

> "…*Its impact is expected (to be) good and important at regional and national level. The overall quality is good and gives confidence for the proper implementation of the Action*" (TEN-T 2012, Annual Call, p.66).

European policy is focused on promoting and sustaining economic growth within Europe in an environmentally sustainable manner. The development of integrated transport links is considered a key requirement of policy; accordingly TEN-T is being developed as the priority to deliver a unified transport network. Multi-modality is a principle of the TEN-T, but it is acknowledged that there may be necessary exceptions to multi-modality due to economic or environmental realities. The Port of Cork

has been identified by the European Commission as a TEN-T core network port, and its development proposals under the SDP endorsed by grant assistance under the 2012 TEN-T Work Programme.

4.2 National Economic Policy

National economic policy is reflected in reports by Forfás and the National Competitiveness Council (NCC) which have focused on the need to improve the competitiveness of our main exporting sectors. The NCC has identified the sectoral opportunities that can drive export growth; the key competitiveness factors affecting them; and the sector-specific actions which are required to improve their competitiveness. In the case of the marine sector, good international sea access coupled with effective internal connectivity is seen as a key factor in mitigating the impact of Ireland's peripheral location. Forfás and the NCC state that:

> *"In view of the long lead times for the delivery of air and sea port infrastructure and services, it is critically important that we plan now to ensure that our cities are well positioned to meet the longer term needs of business and citizens across the island." (Our Cities..., page 9)*

In terms of providing for a longer term framework to underpin national prosperity, Forfás states that:

> *"Ireland needs to consider better sea links to the main markets, including those of the future in Asia and South America, and to plan the necessary infrastructure for example, deep sea port facilities…" (Sharing our Future..., page 117)*

In addition Forfás states, on page 3 of its Assessment of Port Services Issues for Enterprise (January 2009), that:

> *"Provision of deeper water facilities: The increasing international shipping trend toward larger vessels has clear potential to impact on the ability of Irish ports to continue to offer the current range and frequency of services unless adequate deeper water facilities are provided. If deeper water facilities are not provided in the medium term, this will lead to a reduction in the number of routes and services to and from ports on the island of Ireland, and an increase in costs because of the reduced capacity. A number of Irish ports, including Dublin, do have the potential to provide deeper water services. The proposed development by the Port of Cork at Ringaskiddy has the type of deeper water levels that will be required to accommodate larger ships."*

The 'proposed development' referred to above was the previous scheme developed for the Oyster Bank. It is clear from this and other statements by Forfás and the NCC that the provision of adequate deep water terminal facilities is considered a fundamental requirement for developing and maintaining economic growth and national competitiveness and is a priority in terms of national economic policy.

4.3 National Spatial Strategy 2002-2020

The National Spatial Strategy (NSS) was reviewed in 2010 and concluded that all the international evidence pointed to the role that competitive and sustainable cities and their wider regions play in underpinning overall national competitiveness. The NSS designates Cork as a Gateway which will contribute to Ireland's economic growth, and identifies the significance of sea port services to the economic strength and competitiveness of regions.

The strategic importance of the Gateways is that they are focal points for transportation with

> *"…adequate, reliable, cost effective and efficient access to port facilities" (NSS p.40).*

The strategy notes, in regard to ensuring regions' international competitiveness, that:

> *"It will be important to ensure that regions have the required access to international markets for goods, services and labour mobility. The capacity to attract mobile investment will be supported by the strategic development of infrastructure such as telecommunications, energy networks, regional air and sea port services." (NSS, p.98)*

More explicitly, in terms of the strategic radial corridors to the South-West the National Spatial Strategy recognises the need for

> *"…good quality road and public transport connections between Dublin and Cork, improved road access to Cork Port and Airport" (NSS p.59).*

The NSS recognises the significance of sea port services to the economic strength and competitiveness of regions, and particularly the national Gateways.

4.4 Harnessing Our Ocean Wealth: July 2012

'Harnessing Our Ocean Wealth: An Integrated Marine Plan for Ireland' (IMP) was published in July 2012 by the Department of Agriculture, Food and the Marine. It sets out a roadmap for the government's vision, high level goals and integrated actions across policy, governance and business for the marine sector. The vision of the IMP is stated as:

> *"Our ocean wealth will be a key element of our economic recovery and sustainable growth, generating benefits for all our citizens, supported by coherent policy, planning and regulation, and managed in an integrated manner."*

The IMP notes that:

> *"Infrastructure includes fixed assets (e.g. ports, fisheries harbours, piers, slipways, buildings etc), mobile assets…., research, educational and innovation platforms… and datasets…*
>
> *Maintaining, upgrading and providing these infrastructures is critical to our national economy (e.g. 99% of Ireland's exports and imports are transported through Ireland's ports); energy needs and export potential (e.g. grid infrastructure)…" (IMP July 2012, p. 43)*

The key actions for infrastructure include:

> *"No. 32:Put in place clear integrated policies and strategies for the development of new key strategic infrastructure to support job creation and economic growth (e.g the gird and port infrastructure to support renewable energy and export potential).*
> *…*
> *No. 34: Carry out national regional and local initiatives aimed at tapping into the potential of new and existing coastal infrastructure to develop sustainable products, services and jobs. This would encourage investment along the coast. Initiatives include:*
> *…*
>
> *Supporting major national seaports in the implementation of their master plans to provide additional capacity and greater draft using their own resources. " (IMP July 2012, p. 43-44)*

The provision of enhanced port infrastructure is identified as a critical action and clear policy support is provided for the implementation of port master plans (such as the SDP).

4.5 2013 National Ports Policy

The 2013 National Ports' Policy (NPP) is identified as a contribution to achieving the vision of the 2012 IMP – Harnessing Our Ocean Wealth. It is stated that the NPP:

> *"… clearly sets out a roadmap for the ports sector for at least the next generation, setting down clear objectives, the policies to achieve them and timelines for doing so." (NPP, p. 9)*

The core objective of the NPP is to facilitate a competitive market for maritime transport services. The policy identifies that the long-term international trend in ports and shipping is toward increased consolidation of resources in order to achieve optimum efficiencies of scale.

The NPP introduces a clear categorisation of ports, namely: Ports of National Significance (Tier 1), Ports of National Significance (Tier 2) and Ports of Regional Significance. The Port of Cork is one of

three ports identified as at Tier 1 'Port of National Significance (along with Dublin Port Company and Shannon Foynes Port Company). It is noted that it is critically important that Ports of National Significance (Tier 1 & 2) provide an efficient and cost-effective service to the economy. Tier 1 ports are identified as Ports that:

- *"…are responsible for 15% to 20% of overall tonnage through Irish ports, and*
- *have clear potential to lead the development of future port capacity in the medium and long term when and as required." (NPP, .p13)*

The NPP reemphasizes the government's policy outlined in the 2005 Ports' Policy Statement that the ports sector should receive no further Exchequer funding for infrastructure development.

The NPP is not prescriptive as regards the location of future port infrastructure, but it notes that specific locations of future port capacity should be incorporated within the existing planning and development policy hierarch. It also encourages active engagement between port companies and the relevant planning authorities to ensure that port masterplans and relevant planning and development strategies are complementary and consistent. In other words, while the NPP's core objective supports the expansion of port capacity, it is consider that locational issues are most appropriately addressed within existing spatial planning policy documents.

With specific reference to the Port of Cork the NPP notes that it is one of only two ports capable of handling traffic across all five principal traffic modes (LoLo, RoRo, Break Bulk, Dry Bulk and Liquid Bulk) and is second only to Dublin in its importance in the LoLo sector. The NPP states that:

> *"The Government endorses the core principles underpinning the company's Strategic Development Plan Review, and the continued commercial development of the Port of Cork Company is a key strategic objective of national Ports Policy." (NPP, p.26)*

In relation to the European unified transport network (TEN-T) the NPP notes that three ports are proposed for inclusion within the network – Dublin, Cork and Shannon Foynes. It also notes that efficient hinterland connections are critically important to a port's ability to facilitate large volumes of traffic. It states that TEN-T core ports must have a connection to both core road and rail networks, although it is acknowledged:

> *"The vast majority of Ireland's freight movements to and from ports are via road. As acknowledged in the European Commission's White Paper, Roadmap to a Single European Transport Area – Towards a Competitive and Resource-Efficient Transport System, it is likely that "freight movements over short and medium distances (below some 300km) will to a considerable extend remain on trucks" (Commission of the European Communities 2011c)." (NPP, p.45).*

In recognition of the likely continued focus on road freight in Ireland, the NPP states that the interconnections between the national primary road network and the commercial port network will continue to be of primary importance.

The NPP also identifies the relationship between ports and major cities, noting that as port facilities have shifted downstream over time it has allowed for the redevelopment of previously port-related lands for other commercial, residential or recreational uses. While it is acknowledged that this can be of mutual benefit to ports and local authorities, the NPP states that the cost of relocating and redeveloping port facility must be considered in any redevelopment plans. This point is made in the context of the government's policy to require ports to fund any infrastructure developments from its own resources. It is stated within the NPP that:

> *"…redevelopment proposals must take account of the need for sufficient replacement port capacity within the region. Any development proposals requires careful consideration by all relevant stakeholders, in particular the planning authorities, local communities, port authorities and port users.*

The NPP sets a clear policy context for the future expansion of Port of Cork activities, emphasising the crucial role to be played in facilitating national economic growth.

4.6 Transport 21 2006-2015

Transport 21 set the projected capital investment framework under the National Development Programme over the period 2006 – 2015, although actual expenditure has been significantly curtailed due to the national economic downturn.

The framework proposed €34 billion of investment in the roads, public transport and regional airports. €14 billion of the projected investment was targeted at the Greater Dublin Area, with the National Programme projected to receive around €20 billion. €18 billion of the investment programme was to be targeted at the national roads, with €16 billion targeted at public transport and the regional airports.

In terms of the rail network, Transport 21 proposed to upgrade the intercity rail network and expand commuter rail services in Dublin, Cork and Galway. The Transport 21 programme did not provide for any significant addition to the heavy rail network, or any investment to increase the rail freight capacity in the South West Region.

The N28, linking Cork City to Ringaskiddy, was proposed for upgrade under Transport 21, but this investment was suspended due to economic cutbacks. A decision has now been taken to proceed with the upgrade. A Consultant has been appointed by Cork County Council/National Roads Authority to prepare an EIS and publish a Compulsory Purchasing Order (CPO) for the upgrade with a view to submitting the scheme for statutory approval by end of 2014/ early 2015. It is anticipated that the new route will be in place 2020 / 2021.

4.7 The South West Regional Planning Guidelines 2010

The 2010–2022 South West Regional Planning Guidelines (2010 RPGs) highlight the importance of the relocation of the port to the region's strategic spatial strategy; acknowledge the limitations of potential rail transport and state that future port facilities need to be well served by the road network. S.1.3.33 of the 2010 RPGs state:

> "*There is an immediate requirement to identify an appropriate location with deep water for enhanced port facilities within Cork Harbour to accommodate increasing traffic and to help secure the redevelopment of the City Docklands. In the past, proposals to relocate the port have raised concerns regarding the most appropriate land-side transport arrangements for freight. The rail network serving Cork does not provide an adequate means of collection/distribution of freight to the region and so future port facilities need to be well served by the road network."*

The 2010 RPGs provides a significant change in the policy context from the 2004 South West Regional Planning Guidelines (2004 RPGs). The 2004 RPGs supported the principle of the expansion of the port, as a key economic drive for the region, but also recommended the expansion of rail freight connections to port facilities, with particular reference to Tivoli and Marino Point. The 2010 RPGs continue to recognise the need for expansion of the port's activities to the regional economy; but as noted above, acknowledge that the rail network in Cork is not suited to the effective distribution of freight.

S.5.5.8 of the 2010 RPGs emphasises the importance of the port's growth to the region, stating:

> *"It is important to the development of the region's economy that the Port of Cork can increase its tonnage in line with the future economic growth of the region and its own strategic development plan (currently under review) will guide this approach."*

4.8 Cork Area Strategic Plan (CASP) 2001-2020

CASP is a non-statutory document which was jointly undertaken by Cork County and Cork City Council to provide a vision and strategy for the development of the Cork City Region up to 2020. CASP identified the Port of Cork to be of strategic national importance:

> *"The Port of Cork contributes significantly to the well being of commerce, industry and tourism, not just of the Cork sub-region, but beyond, to the entire country." (CASP, p.116)*

CASP considered that the Cork Area Strategic Plan and the Port of Cork's Strategic Development Plan were mutually reinforcing and that there was a need for effective partnership between the City and County Councils to ensure the accomplishment of both strategies. Essentially much of CASP objectives for growth of Cork City are dependent on the relocation of the Port's activities from the City Quays and Tivoli.

During the drafting of the CASP Update the application for relocation of the Container Terminal to Ringaskiddy was being considered by An Bord Pleanála. The Update noted the Board's decision to refuse the 2007 Oyster Bank application and concluded that the Planning Authorities, in conjunction with the Port of Cork would need to assess the issues raised by the Board regarding the scale and nature of future port development and possible alternatives.

Notwithstanding this reference to the Board's decision, the CASP update continued to support the construction of the N28 Ringaskiddy Port Access Route to:

> *"…improve access to the proposed new port facilities including a container terminal at Ringaskiddy." (CASP Update, p.xvii)*

Further the Update's major transport infrastructure proposals included:

> *"The development of a new container terminal and other port related facilities at Ringaskiddy." (CASP Update, p.xvii)*

The Update also reiterated the importance of updating and relocating the inner harbour Port of Cork facilities:

> *"The maintenance of modern port facilities and the need to release port related land in the Docklands and at Tivoli for mixed-use development formats are both critical to the overall strategy for the sustainable development of the CASP area and to the achievement of the target populations for the City." (CASP Update, p.xix)*

Indeed, the CASP Update states that its spatial strategy takes account of a number of developments, including:

> *"The relocation of port activity to the Ringaskiddy area and the implications for future employment growth, public transport provision and freight movements." (CASP Update, p33).*

CASP's promotes an integrated transport strategy, which includes the aim to achieve a modal shift from car based commuter traffic to public transport, thereby reducing congestion and facilitating a prioritisation of road space on regional and national routes for strategic traffic:

> *"The provision and management of roads, parking and facilities for private cars and road based transport must be carefully managed and monitored so that road access is given an appropriate role in the integrated system without compromising, for example, the strategic role of national trunk routes for access to the port and the airport." (CASP Update, p.71)*

CASP's policy is supportive of the Port's proposals to relocate its inner harbour activities and of its preference to develop Ringaskiddy. While the CASP update makes reference to the Board's decision to refuse the 2007 Oyster Bank application and the need to consider alternative possibilities, its key policy statements support the relocation of port activity to Ringaskiddy.

4.9 Cork County Development Plan 2009-2015

The Cork County Development Plan 2009-2015 (2009 CDP) provides the spatial planning context for the location of additional port facilities in Cork County and details policies in relation to transportation and heritage and environment, which are relevant to the port's development.

4.9.1 Port Strategy

The 2009 CDP recognises that the Port of Cork is:

> *"…the most significant port in the state, outside Dublin. It contributes to the overall economic success of the South West Region, particularly in the manufacturing, commercial, industrial and tourism sectors".*

The Plan supports the relocation of the Port of Cork not only to promote strategic employment growth but also to facilitate the release of land which would allow urban renewal and redevelopment close to the heart of the city, in line with the CASP strategy:

> *"The container facilities at Tivoli should be relocated to areas where larger modern ships can be accommodated and where they are served directly by the national road network, facilitating the movement of freight by road without the need for heavy goods vehicles to pass through either the city centre or any other major residential areas." (2009 CDP, p.142)*

For this relocation of certain port activities, the 2009 CDP promotes Ringaskiddy as a "preferred location". Development Plan objective INF 4-1 states:

> *"It is an objective to support the relocation of port activities and other industry away from the upper harbour on the eastern approaches to the city. Ringaskiddy remains the preferred location for the relocation of these activities. The Council is committed to engage with the Port of Cork and other relevant stakeholders in order to address the issues in relation to Ringaskiddy and, if necessary, give consideration to possible alternative locations." (2009 CDP, p.236)*

This objective is notable as in the Inspector's Report of the 2007 Oyster Bank application; the Inspector stated that the County Development Plan:

> *"…nowhere specifically identifies Ringaskiddy as the preferred relocation site for the upstream facilities of the Port of Cork in terms of a new container terminal" (04.PA0003 ABP Inspector's Report, p.11)*

As the decision by An Bord Pleanála to refuse the 2007 Oyster Bank application raised concerns with regard to traffic impacts on road network and a lack of potential for the development of freight at Ringaskiddy, the 2009 CDP is committed to reconsider the various options for the redevelopment of Port facilities. In the meantime, the 2009 CDP has an objective to protect land at Ringaskiddy which has potential for port related development:

> "*It is an objective to ensure that land with the potential to accommodate port related development, particularly at Ringaskiddy, but also at the other ports throughout the County, is, normally, protected from inappropriate development that would prejudice its long term potential to accommodate this form of development*" (Econ 3-5, p. 155)

The 2009 CDP also acknowledges that there are number of restricted and amenity uses at Ringaskiddy that require protection against inappropriate development.

4.9.2 Transportation Policy

In terms of transportation policy the 2009 CDP's primary aim is to support the implementation of government transport policy, as expressed in Transport 21. The 2009 CDP puts forward a number of objectives to enhance the efficiency of the existing road networks; improve patronage of public transport (including rail) for commuting and to promote forms of development that reduce levels of dependence on private car transport. The 2009 CDP does not include any transport policy related to the appropriate mode for freight transport, or any policy aimed at increasing the potential for rail freight.

It is notable that the 2003 County Development Plan (2003 CDP) had a specific objective:

"...to promote jobs led investment that could be facilitated by the availability of rail services for commuter and goods traffic" (INF 1-7 p78, 2003 CDP)

This objective was referred to by the Board's Inspector in his review of the Ringaskiddy application. There is, however, no specific objective in the 2009 CDP related to the development of rail services for goods traffic. The draft Cork County Development Plan 2013 (discussed in 4.10) recognises that rail freight has a role in terms of niche cargo, but is limited in its capacity to deal with general freight cargo.

The only reference to freight transport is related to the potential relocation of container facilities from Tivoli which would facilitate "the movement of freight by road without the need for heavy goods vehicles to pass through either the city centre or any other major residential area".

4.9.3 Heritage and Environment

There are a number of proposed Natural Heritage Areas; candidate Special Protection Areas and Special Areas of Conservation within Cork Harbour. Map 16 (Heritage & Conservation Maps) of the 2009 CDP identifies the special designated areas within the wider Cork Harbour, which include Monkstown Creek, to the west of the ADM Jetty and the channel to the north of Marino Point.

The 2009 CDP reflects the legislation on protection of designated areas through objective ENV 1-5, which states:

"(a) It is an objective to provide protection to all natural heritage sites designated or proposed for designation in accordance with National and European legislation. This includes SACs, SPAs, NHAs, Statutory Nature Reserves and Ramsar Sites.

(b) It is an objective to:

- *Protect the conservation value of all European sites, as defined in the Planning and Development Acts 2000... and to ensure that appropriate assessments are carried out where development plans or projects are likely to have significant effects on these sites.*
- *Assess all proposed developments which are likely to impact (directly or through indirect or cumulative impact) on designated natural heritage sites or sites proposed for designation and protected species in accordance with the relevant legislation;*
- *Require that an adequate level of environmental assessment is prepared to an acceptable standard in respect of any proposed plan or project likely to have an impact on these sites or protected species."*

4.9.4 Summary

In summary, the 2009 CDP policies relevant to the Port of Cork:

- Recognise the importance of the port and the need for its relocation and development to promote strategic employment growth in Cork City and County
- Support the relocation of the Port of Cork to facilitate this strategic employment growth and to facilitate redevelopment of land within the city
- Identify Ringaskiddy as the "preferred location" for the relocation of the port's inner harbour activities
- Aim to protect land suitable for the expansion of port facilities from inappropriate development
- Recognise the need to protect existing residential and recreational amenity in any redevelopment proposals
- Recognise the benefit, in terms of promoting residential amenity and more sustainable transport, of removing freight transport from city centre routes and other major residential areas. (Unlike the 2003 CDP the Council does not seek to promote rail services for goods traffic)
- Recognise the need to develop an integrated approach to the planning and development of the harbour, through the provision of a specific study to feed into the local area plan process
- Require that any proposed development is screened for impact on any designated conservation areas and scenic amenity routes

4.10 Draft Cork County Development Plan 2015-2021

The draft Cork County Development Plan 2013 (draft CDP) was issued in December 2013 and a final plan is due to be adopted in early December 2014. The draft CDP continues to recognise the significance of the Port of Cork to the economic success of the South West Region. It notes that the Port is identified in the NPP as a Port of National Significance (Tier 1) and is proposed for inclusion as one of the 3 ports in the state in the TEN-T.

The draft CDP endorses the principle of the proposal to further develop port facilities at Ringaskiddy, noting:

> *"This plan supports the Port of Cork's proposals to expand its facilities in Ringaskiddy to that port centred operations and logistics can become more efficient through the accommodation of larger ships and so that port traffic can directly access the National Road network without passing through the City Centre. The planned expansion of Port facilities at Ringaskiddy will release dockland areas close to the City for planned redevelopment in line with proposals set our in the City Council's development and local area plans." (draft CDP, paragraph 10.5.16)*

In relation to rail freight the draft plan recognises the limitations of rail freight in terms of general cargo, noting that alternatives to road freight are difficult to justify on cost grounds (draft CDP, paragraph 10.5.2). Nonetheless the draft CDP also recognises that there may be potential to develop rail freight for bulk cargo and accordingly proposes to protect rail freight facilities at the former IFI plant at Marino Point [draft CDP, Objective TM 5-1].

The draft CDP has an unequivocal policy objective to facilitate the expansion of port facilities at Ringaskiddy and to support the development of appropriate road transport capacity to ensure the efficient movement of goods vital to the competitiveness and economic welfare of the Cork Region. Objective TM 5-2 states:

a. "*Ensure that the strategic port facilities at Ringaskiddy, Whitegate and Cork Airport have appropriate road transport capacity to facilitate their sustainable development in future years.*
b. *Support the relocation of port activities and other industry away from the upper harbour on the eastern approaches to the city.*
c. *Support Ringaskiddy as the preferred location for the relocation of the majority of port related activities. Also recognising the key role that Marino Point can play in providing an alternative relocation option for some of the port related uses that could best be served by rail transport. The Council is committed to engage with the Port of Cork and other relevant stakeholders in achieving this objective."*

In relation to Heritage and the Environment, the draft CDP continues to include objectives to ensure the protection of natural heritage sites designated or proposed for designation under National and European legislation and International Agreements.

4.11 Cork City Development Plan 2009-2015

The Port of Cork is also identified by the Cork City Development Plan 2009 (2009 CCDP) as a major contributor to the city in terms of its economic, industrial, tourist and historical significance, it states that:

> *"It is the policy of Cork City Council to support the Port of Cork in its strategically important operations and future plans for expansion and relocation."*

The 2009 CCDP supports the proposals for the relocation of the port activities to facilitate the redevelopment potential of existing port lands close to the heart of the city:

> *"A capacity analysis has indicated that, with appropriate investment, the South Docks area is capable of supporting a population of approximately 20,000 residents and a working population of approximately 25,000 persons. However the achievement of this target will be dependent on the relocation of the Port of Cork".*

The relocation of port activities, particularly from City Quays and Tivoli, is seen as a key issue because the 2009 CCDP aims to benefit from released lands and use their potential for future development of the city:

> *"Tivoli has been identified in the CASP as an area with future potential for residential and employment uses. The City Council is committed to supporting the regeneration of the Tivoli area by the preparation of a Local Area Plan. [...] Key issues to be resolved prior to regeneration of Tivoli include the timing of the relocation of port activities."*

In addition to redevelopment of land, the South Docks Local Area Plan 2008 identified the potential for enhanced use of the River Lee for leisure and amenity use when port activities are relocated. The potential for use of the River is addressed further in the draft City Development Plan 2014, discussed in section 4.12.

Chapter 5 of the 2009 CCDP considers transportation. The plan makes only limited reference to freight traffic - in policy 5.16 which is related to the development of a Mobility Management Centre:

> *"To support the development of a Mobility Management Centre to efficiently and effectively manage travel of people and freight throughout the city"*

4.12 Draft Cork City Development Plan 2015-2021

The draft Cork City Development Plan 2015-2021 (draft CCDP) was published in April 2014. It continues to identify the importance of the relocation of port activities to achieve the strategic development objectives for Cork Docklands and Tivoli. The draft plan identifies issues which have constrained the redevelopment of the Docklands, including the failure to relocate port activities. It identifies the relocation of the Port as a critical step that needs to be undertaken to facilitate and encourage the redevelopment of Docklands.

The draft CCDP identifies the future development potential of Tivoli, which it notes has an extensive south facing waterfront and commuter rail line running along its northern boundary. It notes that the Council is committed to supporting the regeneration of the Tivoli area through the preparation of a Local Area Plan. The timing of the local area plan will be linked to the programme for relocation of the Port and the likely timetable for lands becoming available for redevelopment.

The draft CCDP also continues to identify the potential for further developing the Upper Harbour for tourism and recreation after the relocation of Port activities and notes the intention to commission a River Use and Management Plan to examine the commercial and recreational potential of the Upper Harbour.

4.13 Carrigaline and Midleton Local Area Plans 2011

The Carrigaline and Midleton Electoral Area Local Area Plans 2011 (LAPs) have both been reviewed since the Board decision on the Oyster Bank application. Both plans reflect the revised 2009 CDP policy for the development of Port facilities in the lower harbour, with Ringaskiddy as the preferred location for container activities.

The 2011 Carrigaline LAP provides the planning policy and zoning objectives for Ringaskiddy. The strategic aims for Ringaskiddy are to reaffirm its strategic industrial and port related roles and seek to promote its potential for large scale stand alone industry, which are in line with the strategic objectives for the settlement set out in the 2003 Carrigaline LAP. The 2011 Carrigaline LAP provides additional general development objectives for Ringaskiddy, which were not established in the 2003 LAP. These include the specific objective DB-02:

> *"…to facilitate the relocation of the Port of Cork's container and bulk goods facilities to Ringaskiddy."*

As illustrated in the zoning map (Figure 4.1 contained in EIS Volume II), the 2011 Carrigaline LAP zones the Port lands I-18 'Port Facilities and Port Related Activities', noting that any development is likely to require a Natura Impact Statement.

The majority of land around Ringaskiddy is zoned for industrial use, although the village core is zoned for town centre / neighbourhood uses and there is some provision made for open space and amenity use, as illustrated on the zoning map in the LAP. The zoning map also shows the proposed route of the N28 upgrade, which will remove traffic from the residential core of Ringaskiddy and the village of Shanbally. The final route of the N28 will be determined following the current design process being undertaken by the NRA.

The Midleton Electoral Area Local Area Plan, August 2011 notes that the Port of Cork have identified Marino Point as a potential location for additional bulk / general cargo facilities and bulk liquids handling and storage function. The 2011 Midleton LAP establishes a special policy objective X-01, to facilitate the development of the site for port related industrial developments. In the 2003 Midleton LAP it was considered there were a number of outstanding issues to be considered before development proposal for the site could be considered (such as the existence of the Seveso industry).

The 2011 Midleton LAP also notes that the scope for container freight at Marino Point may be limited and that any large scale proposals or proposals for traffic intensification cannot be permitted in the absence of the upgrading of the R624 Regional Road.

4.14 Summary

The proposal for Ringaskiddy redevelopment is consistent with European and national policy objectives, which identify high quality transport infrastructure, including port facilities, as essential for economic growth; maximising Ireland's ocean wealth; and ensuring competitiveness of Ireland and Europe.

At a European level, the TEN-T recognises the Port of Cork as a core network port; and significant grant funding has been awarded to progress the Port's strategic development proposals.

The 2013 National Ports' Policy (NPP 2013) establishes the policy framework for the development of port facilities in Ireland. It identifies the Port of Cork as one of 3 'Tier 1 – Ports of National Significance' and endorses the principles contained within the SDP. The NPP 2013 notes that identification of appropriate locations for port expansion should be addressed within spatial planning policy documents.

The 2010 Regional Planning Guidelines (RPGs 2010) highlight the importance of the relocation of the Port to the region's strategic spatial strategy; acknowledge the limitations of potential rail transport and state that future port facilities need to be well served by the road network.

Spatial Planning Policy (CASP, the 2009 County Development Plan and 2011 Local Area Plans) identify Ringaskiddy as the preferred location for the primary expansion of port activities and the application lands at Ringaskiddy are zoned to provide for the location of the Port of Cork's container and bulk goods facilities. This objective is reinforced within the draft Cork County Development Plan 2013, which is due to be adopted in December 2014. The Cork City Development Plan 2009-2015 and the draft City Development Plan 2015-2021 both identify the critical need to relocate Port activities to facilitate the redevelopment of the Docklands and Tivoli and to maximise the potential of the Upper Harbour for other commercial and recreational uses.

5.0 HUMAN BEINGS

5.1 Introduction

There are a wide range of issues which may impact on human beings. Many are considered within other Chapters of this EIS. Potential impacts considered elsewhere are: Landscape & Visual; Traffic and Transportation; Noise & Vibration; and Air Quality and Climate. Having regard to the '*Advice Notes on Current Practice*' [Environmental Protection Agency (EPA) 2003] the issues considered within this chapter are:

- Economic Activity
- Social Considerations
- Land-use
- Health & Safety

Consideration is given to sensitive neighbouring occupied premises such as homes; schools; and commercial premises and to the transient population, such as drivers and tourists.

The proposed redevelopment is within Ringaskiddy village and close to Shanbally village. The village of Ringaskiddy is characterised by existing large industry and port activities. There is a small residential population (c.500) and a relatively high proportion of temporary residents due to student accommodation linked to the National Maritime College of Ireland and temporary workers accommodation linked to Ringport Business Park. Residential amenities include a primary school, church, convenience shop, bar, restaurant and crèche.

Shanbally is a small residential community (population of c.300 people). Residential amenities include a primary school, church, shop and bar.

There are a number of recreation and amenity facilities serving Ringaskiddy and Shanbally, including GAA pitches and a soccer club. Within the lands proposed for redevelopment, existing recreation and amenity facilities which are open to the public, are Ringaskiddy pier and slipway; an informal walking route on undeveloped Port lands and a sculpture garden.

The principal receptors that may be impacted by the proposed redevelopment are identified as:

Residential Receptors

- Residential properties adjacent to the Port
- Residential properties within 0.5km of the site
- Residential properties adjacent to the primary transport routes
- Residential properties in the wider context
- Land zoned for residential development

Direct Economic Receptors

- Commercial and Industrial premises in close proximity to the site
- Commercial activities located within Cork Harbour
- Tourism activities in and around Cork Harbour
- Zoned commercial lands in close proximity to the site
- Operational and construction related employment

Indirect Economic Receptors

- Suppliers of construction materials
- Commercial and industrial activities served by the N28

Social and Community Facilities

- Schools in the vicinity or located on the N28
- Third level educational & research facilities (National Maritime College of Ireland and proposed Beaufort Laboratory)
- Recreation and Amenity facilities – within Ringaskiddy village and Cork Harbour
- Land zoned for recreation or amenity use
- Cork Crematorium

- Churches within Ringaskiddy village or located on the N28

Transient Population

- Commuters using the N28
- Passengers of the Ferryport

Other

- Irish Naval Base
- Permitted Developments within Ringaskiddy, or located on the N28

5.2 Assessment Methodology

The methodology for the Human Beings Chapter consists of a detailed assessment of the human environment baseline and identification of potential receptors; appraisal of the proposed redevelopment to identify potential impacts; consultation with relevant agencies / stakeholders and a public consultation process. The methodology for developing the baseline involved desk top analysis of available mapping and aerial images; visits to the site and surrounding area; census analysis; review of relevant documents; review of comments from statutory bodies and the public consultation process; and consultation with Port of Cork.

5.3 Existing Environment

Figure 5.1: Aerial view of Port of Cork Lands at Ringaskiddy

Ringaskiddy has a population of circa 480 people. The village consists of a main street running east/west along the N28 with some smaller streets running off the main street to the south. The Port of Cork occupies lands to the north of the N28 (see Figure 5.1). All figures not located in text are provided in EIS Volume II. Figure 5.2 provides a map of the Ringaskiddy and immediate surrounding area, with key potential receptors identified.

The settlement is dominated by port and industrial uses, with relatively limited residential or amenity uses. The Carrigaline Electoral Area Local Area Plan 2011 (Carrigaline LAP) notes that the strategic aims for Ringaskiddy are to reaffirm its strategic industrial and port related roles and seek to promote

its potential for large scale stand-alone industry; while existing residential and amenity uses should be protected from the impact of large scale development.

Ringaskiddy is connected by road to Haulbowline Island at the eastern end of the village. Haulbowline Island is home to the Irish Navy, the old Irish Steel site and the Coastal Marine Research Centre. A crematorium is located on a small island – Rocky Island - between Haulbowline and Ringaskiddy.

Spike Island is situated in the lower Cork Harbour, to the east of Ringaskiddy. Access to the island is currently only possible by boat, with regular tours leaving from Cobh. Spike Island currently offers visitor tours to the military fortification. Strategic plans are being prepared to develop the Island as a more significant tourism and recreational attraction for the Cork area.

Monkstown village is located across the harbour, north-west of Ringaskiddy and the port lands are visible from much of the village. Monkstown is linked in spatial planning policy to Passage West and Glenbrook and the area is identified as an important residential settlement within Metropolitan Cork. Monkstown is also identified as a significant centre for water based activities.

Rushbrooke Dockyard is located north of the port lands. Whitepoint, Cobh is located to the east of Rushbrooke and is a relatively low density residential area. The port lands form part of the harbour vista from a number of residential properties at Whitepoint.

Cobh town is located on the opposite side of the harbour to the north, with the main commercial area of the town facing onto the harbour. The town has a steep topography, with many residential areas having a vista of the harbour and the port lands form part of this vista. There are limited views of the port lands from the commercial part of Cobh town. The shipping lane (known colloquially as Cobh Road) passes up the middle of the harbour and crosses in front of the town.

Carrigaline is located approximately 5km to the south west of Ringaskiddy. It is a key residential settlement of approximately 13,000 people. Carrigaline experiences strong commuting to Cork City and Ringaskiddy.

Crosshaven is located to the south east of Ringaskiddy. It is a small settlement with a population of c. 1,700. The strategic planning aim for Crosshaven is to consolidate the settlement and recognise its important economic, leisure, tourism and marine roles within Cork Harbour Area. The main access route from Crosshaven to Cork City is on the N28, via Carrigaline. The Carrigaline LAP has not identified a strong commuting link between the Crosshaven and the city.

The proposed redevelopment will result in the relocation of some of the Port's current activities from Tivoli and City Quays. The relocation of activities from these sites will provide redevelopment opportunities in the city. In addition to redevelopment of land the South Docks Local Area Plan has identified the potential for enhanced use of the River Lee for leisure and amenity use when port activities are relocated.

5.3.1 Residential Receptors

5.3.1.1 Residential Properties Adjacent to the Site

There are no residential properties directly adjoining the Port lands. The residential properties closest to the site are those located to the south of the N28 on the main street of the village.

There is a row of 9 houses immediately south east of the entrance of the deepwater terminal (one house is currently derelict) – Plate 5.1. Within this row of houses there is a public house (Sam's Bar) – Plate 5.2. Between this row of houses and the entrance to the ferry port there are approximately 30 houses that face onto the N28 and directly overlook the Port lands, 8 of these houses are set back slightly and separated from the road by a small semi-circular green.

Plate 5.1: Houses to South East of Deepwater berth (DWB)

Plate 5.2: Public House, Sam's Bar

5.3.1.2 Residential Properties within 0.5km of the Site

There are approximately 173 residential units within 500m of the site. This includes 16 temporary demountable residential units north of the entrance to Ringport Business Park; and 36 student housing units at Ferryview Park (with a capacity to accommodate a maximum of 216 students).

5.3.1.3 Residential Properties Adjacent to Primary Transport Routes

There are approximately 77 residential properties adjacent to the primary transport route from the existing entrance of the Ringaskiddy port to east of Shanbally. This figure includes all roadside dwellings (1 deep) and 2 deep where plots are open or visible from the road. From Ringaskiddy Port to the Bloomfield Interchange there are approximately 150 dwellings adjacent to the road. From the Bloomfield Interchange to the Dunkettle Roundabout there are another 76 dwellings (2 roadside apartment blocks, Jacobs Island with 38 units each).

5.3.1.4 Residential Properties in wider context

The main settlements within the wider context of Ringaskiddy are; Carrigaline (population c. 13,000); Passage West / Glenbrook / Monkstown (population c. 5,300); Cobh (population c. 12,300) and Crosshaven (population c. 1,700).

5.3.1.5 Land Zoned for Residential Development

There is no land specifically zoned in either Ringaskiddy or Shanbally for future residential development. There are two areas identified on the Ringaskiddy zoning map as 'Town Centre / Neighbourhood Centre', one (T-01) in Shanbally and another (T-02) in Ringaskiddy (see Zoning Map in published Carrigaline LAP). Further development on these lands is required to reflect the scale and character of the surrounding existing built up residential area. Small scale residential development may be considered acceptable within these zones.

5.3.2 Direct Economic Receptors

5.3.2.1 Commercial & Industrial Premises in close proximity to the site

Ringaskiddy is dominated by industrial development and is a strategic location for large scale, stand-alone industry. The Carrigaline LAP notes that in 2009 approximately 7,800 people were employed in the area.

The closest existing industry to the Port lands is the Pfizer site, which is located to the west of the Port's landholding. The lands immediately adjoining the Port site to the west are the location of the former ADM factory and tank farm (currently largely unused). There are a number of other major pharmaceutical and biochemical companies located to the south of the N28 and east of Ringaskiddy. There are also a number of other companies located in Ringaskiddy these include car importers, storage and manufacturing businesses.

There is a limited number of commercial service companies located within Ringaskiddy. There is one small convenience shop – Plate 5.3; one public house (Sam's Bar) and one public house / restaurant (Ferry View) within the village. All of these services are located on the main street. In Shanbally there is one public house located adjacent to the N28 (The Shamrock Bar), and a village shop.

Plate 5.3: Convenience Shop

5.3.2.2 Commercial activities located within Cork Harbour

The primary commercial activities located within Cork Harbour are related directly to Port related activities and fishing. The shipping lane is shown on Figure 5.2. The Port of Cork estimates that 1,252 commercial ships entered the harbour in 2012.

Cork Harbour is one of the largest natural harbours in the world. It offers sheltered fishing in all but the strongest winds. There are approximately 50 fishing boats active in Cork Harbour area. The main type of fishing is at anchor, sometimes drifting and occasionally trawling. Chapter 14, Marine Ecology of this EIS provides a more detailed description of fishing activities within the harbour.

5.3.2.3 Tourism activities in and around Cork Harbour

Cork Harbour provides for a number of marine based leisure activities (including fishing, sailing, kayaking rowing, angling, bird watching and swimming), which support the tourism industry in the area. Marine based leisure activities are also widely used by residents of the County.

The primary tourism related activities in and around Cork Harbour are Spike Island and Cruise Liner traffic, both of which are linked to Cobh town. The 2013 Development Plan for Cobh Town notes that Cobh has significant potential as the tourism base for East Cork, enhanced by its cruise terminal and potential for an iconic tourism product at Spike Island.

Cruise Liner Traffic:

The Cobh cruise liner terminal is owned and managed by the Port of Cork. It currently attracts approximately 60 cruise ships a year. It is an objective of the Port of Cork to continue to promote its cruise liner business.

Spike Island

Cork County Council has set a vision for the development of Spike Island as tourism, cultural and recreational destination for Cork.

Ringaskiddy Village

The village of Ringaskiddy is an arrival / departure point for tourists using the passenger car ferry. The only current ferry route from the port is the Cork / Roscoff once a week service; which arrives from Roscoff on a Saturday and leaves the same day. There are no tourist routes; walking trails; amenities; or heritage / cultural sites of major significance within the village. Tourist facilities in terms of restaurants / accommodation are limited.

5.3.2.4 Zoned Commercial Lands in Close Proximity to the Site

The majority of development lands within Ringaskiddy are zoned for industrial related development (see Chapter 4, Planning Policy Figure 4.1, Carrigaline LAP Zoning Map). The lands surrounding the site are in port ownership and are zoned for port facilities and port related activities. To the east of the site there is an area of land zoned as a third level educational campus for marine related education, research and training though largely in the current ownership of the Port of Cork.

There are large tracts of lands zoned for industrial development to the south of the N28 and also to the west of the site towards the Shanbally area.

Small scale non-industrial commercial development (such as retail / service use) are considered to be acceptable in principle within the lands zoned 'Town Centre / Neighbourhood Centre' at Shanbally and Ringaskiddy village centres.

5.3.2.5 Operational and construction related employment

There are currently 22 people employed by the Port of Cork at the Ringaskiddy site within the following categories: Operations Personnel (12); Engineering Services, Ringaskiddy based (5); Engineering Services, Various locations (5)

At the Port of Cork's Tivoli site there are 43 people employed directly by the Port, within the following categories: Operations Personnel (23); Maintenance General (5); Stevedores / Checkers (5); Engineering Services (10). There are a further 7 people employed directly by the Port based at City Quays.

Construction employees will be direct economic receptors of the proposed redevelopment. Estimates of the number of construction workers required to complete the proposed redevelopment are provided in section 5.4.1.2.

5.3.3 Indirect Economic Receptors

The indirect economic receptors have been identified as:

- Suppliers of construction materials required to complete the proposed redevelopment. At the planning stage it is not possible to identify who these suppliers might be
- Commercial and Industrial activities served by the N28

5.3.4 Social and Community Facilities

5.3.4.1 Schools

There is one primary school within the village - Ringaskiddy Lower Harbour National School which is located approximately 920m south of the boundary of the Ringaskiddy East and has approximately 90 pupils. There are no secondary schools within the village.

Shanbally National School is situated approximately 1.45km east of Ringaskiddy West adjacent to the N28 and has a roll of approximately 214 pupils. There are no other schools within the village or adjacent to the N28.

5.3.4.2 Third Level Education & Research Facilities

The National Maritime College of Ireland (NMCI) is situated approximately 815m from the eastern boundary of the site. The college provides training and education for the merchant marine. During 2013 there was a total of 430 full-time students attending the college. Approximately 180 short term and commercial courses were run at the NMCI during 2013, with a total of approximately 2,250 delegates attending.

University College Cork (UCC) was granted planning permission to develop a Marine based research centre on Port of Cork lands – the Beaufort Building. This building is currently under construction. UCC has also recently gone to tender to prepare a masterplan for the development of complementary research and innovation facilities on lands, in the current ownership of the Port of Cork, adjacent to the NMCI and Beaufort Building (the future IMERC development).

5.3.4.3 Childcare Facilities

One crèche has been identified within the village of Ringaskiddy - Ferryview Crèche, which is located at the entrance to the Ferryview housing estate, approximately 430m south of the development boundary.

5.3.4.4 Community Facilities

Ringaskiddy Community Centre is adjacent to the N28, approximately 340m south of the site. The hall is set back from the road to accommodate one row of parking – Plate 5.4. It is actively used for a range of community activities and events.

Plate 5.4: Community Centre

5.3.4.5 Recreation and Amenity Facilities

Sports Clubs

Pfizer Sports Club is situated immediately west of the Pfizer Ringaskiddy Plant, circa 940m from the proposed redevelopment boundary. Shamrocks Hurling and GAA Club is based in Shanbally. The

pitch is 1.7km south west of the site and behind a number of residential properties south of the N28. The Hibernian Soccer Club is also based in Shanbally, further south west.

Leisure Fishing

The main leisure fishing areas in the vicinity are at the Sea Wall at Monkstown and the deepwater quay, Cobh. Historically the deepwater quay at Ringaskiddy was used for informal leisure fishing. As a secured port area unauthorised access to this area has been restricted for a considerable number of years.

Amenity / Beaches

Within the Port lands there is a Sculpture Garden, commissioned by the Port of Cork, and designed by Vivienne Roche (Plate 5.5). The Sculpture Garden forms part of the landscaping associated with the ferry terminal building.

Plate 5.5: Sculpture Garden

Monkstown seafront is a popular amenity walk and the current undeveloped lands adjacent to Ringaskiddy ferry terminal are also used by the public as a walk along the seafront. At the eastern end of Ringaskiddy is a sandy / rocky shore, known as Gobby Beach. The beach is used for walking and is served by a small car park. There is a footpath from the main Ringaskiddy to Loughbeg Road to the Martello Tower on the eastern shore.

Ringaskiddy pier and slipway are owned by the Port and located within the boundary of the Port's land. The area is served by an informal car-parking area and used by local boat owners for launching leisure boats. The lands to the east of the Ringaskiddy Basin are currently undeveloped and consist of scrublands which are regularly used on an informal basis by some local residents for walking.

Bird Watching

Haulbowline Island is identified as an East Cork Bird Trail Hotspot. A bird reservation is also located at Loughbeg.

Sailing / Moorings

Monkstown Bay Sailing Club operates from de Vesci Place (clubhouse) and Sand Quay (dinghy park) circa 1.15km and 940m north west from the site. Existing racing markers within Cork Harbour are identified by Monkstown Sailing Club on shown in Figure 5.3. These are non-statutory temporary race markings, usually deployed per race.

Figure 5.3: Cork Harbour Race Makers

There are boat launching facilities in Monkstown with limited parking for trailers. Glenbrook has one public slipway. The sailing club also make use of the slipway owned and maintained by the Port of Cork, which is to be relocated as part of the proposed redevelopment.

Cove Sailing Club, Whitepoint, Cobh is a very active club which also hosts several large events – Cobh Peoples Regatta, Cove @ Home, The Marlogue Trophy and the annual Cobh/Blackrock race.

Annual sailing events in the wider area include Cork Week, the Sovereigns and Calves Week. There is also an annual race around Spike Island.

Meitheal Mara is a maritime cultural organisation based in Cork. It was founded in 1994 as a community employment Currach building project and frequently uses the harbour for boating activities. Meitheal Mara organises the annual Ocean to City Race, which is supported by the Port of Cork.

The Port of Cork's Leisure and Recreation Strategy (2009) identifies the present locations of marinas in Cork Harbour, which are concentrated in Crosshaven. It notes that the maximum number of marina berths in the harbour is 515, with storage for 555 boats. Details of proposed marinas at various locations around Cork Harbour are identified as Monkstown (285 berths – permitted in 2010); Passage West (293 berths – refused by An Bord Pleanála); Rushbrooke (180 berths); Whitepoint (235 berths) and Harbour Row, Cobh (180). Since the strategy was published, Cove Sailing Club has received permission for the development of a 74 berth Marina at Whitepoint (permitted January 2011).

The strategy also identifies the number and location of moorings in Cork Harbour, with a total of 1,035 registered moorings in Cork Harbour in 2007. There are 6 moorings located in Ringaskiddy.

Rowing / Kayaking / Swimming

Irish Coastal Rowing Federation Clubs which utilize Cork Harbour include Rushbrooke, Passage West, Commodore, Crosshaven, Fishermans', NMCI and the Naval Service. The Ocean to City Race (held in the summer); is a rowing / boating race from Crosshaven to the City. The race is an important part of the annual Cork Maritime Festival and attracts participants and visitors from the rest of Ireland and abroad.

The harbour is a popular location for sea kayaking trips for local kayaking clubs and commercial entities. Kayakers participate in the 'Ocean to City Race' and there is also the 'Great Island Race', a winter kayaking race circumnavigating the Great Island.

Open sea swimming has become more popular within the harbour and there are a number of events throughout the year, including Cork City to Cobh swim and 'Escape from Spike Island'. Open swimming increasingly attracts participants and visitors from the rest of Ireland and abroad.

5.3.4.6 Churches and Cemeteries

Ringaskiddy Catholic Oratory Church is a small building directly opposite the existing entrance to the Port of Cork, circa 390m south east of the proposed redevelopment boundary – Plate 5.6. The Church of the Immaculate Heart of Mary, Shanbally is circa 1.45km south west of the development boundary and adjacent to the N28.

Barnahely Cemetery is east of the R613/ Jansen Pharmaceuticals, circa 570m south west of the site. The Island Crematorium located on Rocky Island, approximately 1km north east of Ringaskiddy East.

Plate 5.6: Ringaskiddy Catholic Oratory Church

5.3.4.7 Land Zoned for Recreation or Amenity Use

There is a small amount of open space zoned within the village of Ringaskiddy in Carrigaline Local Area Plan. This is designated as providing a buffer zone between existing residential development and adjoining land designated for industrial use. No active recreation or amenity use is proposed on the lands.

Similarly in Shanbally, existing recreational & amenity uses (golf courses and playing pitches) are zoned as open space and additional land is zoned to act as a buffer zone' or to protect the feeding

grounds of bird species. There is an objective to develop further playing pitches on lands zoned O-5, to be provided as part of the future development of industrial zoned lands (I-03).

5.3.5 Transient Population

5.3.5.1 Commuters using the N28

The N28 is a strong commuting route from Carrigaline and surrounding areas into Cork City and also from the City and surrounding areas to Ringaskiddy.

5.3.5.2 Passengers of the Ferryport

Brittany Ferries runs a Cork to Roscoff service with sailings once a week from March to the beginning of November. The ship arrives into port at 10:00 Saturday and departs at 16:00 the same day. The current service caters for a maximum of 2,400 passengers and 650 cars.

5.3.6 Other Receptors

5.3.6.1 Irish Naval Base

Haulbowline Island is located over 1km north east of the proposed redevelopment boundary and is accessed via a bridge from Ringaskiddy. The State owned island is circa 33 hectares and serves as the headquarters for the Irish Navy.

The east part of the island is owned by Cork County Council and is currently waste land, including contaminated waste. Cork County Council has submitted a planning application to An Bord Pleanála for remediation of the lands and provision of a landscaped park (MT0001), a decision on the application is due in mid 2014.

5.3.6.2 Permitted Developments within Ringaskiddy or environs

To identify potential future receptors a review was undertaken of permitted development in Ringaskiddy and its environs over the last five years (including extension of duration of previous permissions). The details of this research are included in Appendix 5.1 contained in EIS Volume III a.

There have been a total of 88 permitted or undecided planning applications within the past 5 years. Of these 30 related to one off housing, extensions or minor amendments to existing residential units. The remaining 58 applications fall within the following categories; Industrial; Institutional; Residential; Commercial; Infrastructural; and Amenity. Each category is discussed in turn.

Industrial:

There have been 33 industrial planning applications. The most significant applications relate to:-

- Wind Turbines: 3 Applications for wind turbines, resulting in permission for a total of 5 wind turbines in the vicinity.
- Novartis: Novartis has made a number of planning applications for the extension of the production facilities at Barnahely, Ringaskiddy. The most recent 13/5727 was granted in November 2013. This application, which did not require an EIS, summarised the status of existing and proposed facilities at the site. It noted that there is a total constructed area of 68,567 sq m; a further 6,165 sq m has now been permitted. In the environmental report accompanying the most recent application, Novartis noted that the projected increase in staff numbers at full operation would be 28; and that it was anticipated that the construction phase would last 15 months, with a peak of 110 construction staff and an average of 90.
- DePuy (Ireland): DePuy (Ireland) has made a number of planning applications for the extension of production facilities at their plant, at Loughbeg, Ringaskiddy. The combined impact of the applications amounted to an increase in production floor area of 3,756 sq m, but it was not envisaged that any additional employees would be required. The company's most recent application (13/6262) for the development of associated car parking spaces (202 spaces) was approved in January 2014.

Institutional

There have been 3 institutional planning applications within the past 5 years. Two of these related to temporary classrooms at Shanbally School.

UCC received permission for the development of a new Maritime Research and Testing Centre on lands adjacent to the NMCI. This building (the Beaufort Building) is currently under construction.

Residential

There have been 6 residential applications (excluding single residential dwellings) in the area within the past 5 years. At Shanbally there have been 2 applications for the development of residential schemes (1 for 15 dwellings and 1 for 8 dwellings); also at Barnahely there have been 2 applications for the development of residential schemes (1 for 3 dwellings and 1 for 43 dwellings).

In addition to the applications for housing there has been 1 application to continue the use of demountable residential units at Ringport; and 1 application has been granted an extension of duration for the development of 23 student apartments at Loughbeg.

Commercial

There have been 4 commercial planning applications in the area within the past 5 years. Two applications related to the development of 10 warehousing units at Raffeen; 1 relates to a golf driving range at Raffeen and 2 relate to the storage of bulk goods at Ballybricken.

Infrastructural

There have been 7 planning applications in the area within the past 5 years for minor infrastructural works. Three relate to masts / antennae; two to community alarms; and two to electrical substations.

Amenity

There have been 3 amenity planning applications in the area within the past 5 years. One relates to the development of an all weather playing pitch linked to the NMCI. The other two applications are:

- **East Tip Remediation Project Haulbowline Island**: Cork County Council has made a planning application for the remediation of contaminated lands at the east tip of Haulbowline Island and to develop a public park on the lands. A decision on the application is due in mid 2014.
- **Community Playground**: Ringaskiddy and District Residents Association were granted permission in January 2014 for the development of a community playground in Ringaskiddy village, on Port owned lands adjacent to the Port's proposed redevelopment.

5.3.7 Demographics

Demographic data is taken from the 2006 and 2011 Census Small Area Population Statistics. The subject site lies in Carrigaline Electoral Division and small area statistics are also available for the settlements of Shanbally and Ringaskiddy. The closest large settlement to Ringaskiddy is Carrigaline and, according to the Carrigaline LAP, a significant number of residents from Carrigaline work in Ringaskiddy.

5.3.7.1 Population and Households

Table 5.1 indicates that the population of Ringaskiddy was 478 in 2011. This is a 7% decline on the 2006 population of 514. Population data was not available for Shanbally in 2006 but the 2011 Census indicates that there was a population of 337. Carrigaline is a significant residential settlement, projected for strong growth in Cork County's spatial planning policies; nonetheless the town also experienced a large population decline of 7.9% from 2006 to 2011. The population decline in Carrigaline and Ringaskiddy is counter to the overall population growth for Cork County and State, which experienced a 10.5% increase and 8.2% increase respectively. The population decreases in Ringaskiddy and Carrigaline might be explained by the economic downturn and outmigration of economically active people seeking work elsewhere in the state or overseas.

Table 5.2 details the household size in 2011. The State and County average household size was 2.8. Household size in Ringaskiddy was somewhat smaller at 2.6 persons, which may be influenced by a relatively high proportion of single households in student accommodation linked to the NMCI and the temporary accommodation linked to Ringport Business Park. The 2011 household size in Shanbally was 3 persons, somewhat higher than the County and State averages and indicative of a more family orientated settlement than Ringaskiddy.

Analysis of Ringaskiddy's family cycle data (Table 5.3) shows that the population of Ringaskiddy is predominately young and economically active. It is likely that a high proportion of the population works within the settlement, or attend the NMCI. This assumption is supported by the travel to work / school / college data, indicated in Table 5.6. This data indicates that 42% of people in Ringaskiddy spend less than ¼ hr travelling to work / school or college, this is significantly higher than the county or state averages of 35% and 34% respectively.

Table 5.1: Population Change 2006 – 2011

Area	2006	2011	% Change 2006-2011
Ringaskiddy	514	478	-7.0
Shanbally	n/a	337	n/a
Carrigaline ED	12,835	11,818	-7.9
County Cork (excludes City)	361,877	399,802	+10.5
State	4,239,848	4,588,252	+8.2

Source: CSO Census Database 2006 & 2011

Table 5.2: Household Size 2011

Area	Households 2011	Household Size 2011
Ringaskiddy	182	2.6
Shanbally	112	3.0
Carrigaline ED	4,012	2.9
County Cork (excludes City)	140,445	2.8
State	1,649,408	2.8

Source: CSO Census Database 2006 & 2011

Table 5.3: 2011 Household – Family Cycle

Family Cycle	Ringaskiddy	Shanbally	Carrigaline	Cork County	State
Pre-family	12.4%	10.5%	11.4%	10.5%	11.2%
Empty Nest	3%	10.5%	8.1%	9.9%	10%
Retired	7.8%	6.3%	4.6%	7.3%	8%
Pre-school	21%	12.6%	15.4%	12.9%	12%
Early school	14%	16.8%	14%	11.8%	11.3%
Pre-adolescent	6.2%	12.6%	12.5%	11.3%	11.1%
Adolescent	5.4%	10.5%	12.7%	11.2%	11.5%
Adult	30%	20%	21.3%	24.5%	24.9%

5.3.7.2 Economic Status and Travel to Work Patterns:

Table 5.5 provides details of the economic status of persons aged over 15 in 2011. The proportion of people at work in Ringaskiddy (47.8%) and Shanbally (46%) is somewhat lower than the proportion for Carrigaline (57.1%) and Cork County (53.4%); although it is not significantly lower than the state

average of 49.3%. Unemployment rates in both settlements (10.4% & 11%) are broadly consist with the County (9.3%) and state averages and somewhat lower than evident in Carrigaline (16.6%).

The economic status data indicates that the economic activity of residential population of Ringaskiddy and Shanbally is broadly in line with state averages, although there is a higher proportion of students, due to the presence of the NMCI and a relatively low baseline residential population.

Table 5.6 provides details of travel to school / work / college times for residents. While Shanbally is broadly consistent with the pattern for the county and state in relation to travel times, Ringaskiddy has a somewhat higher proportion of residents who commute to work or education in under ¼ hour. This is indicative of a relatively high proportion of residents working, or studying within the settlement.

Table 5.5: 2011 Census Persons Aged 15+ by Principle Economic Status

Area (Total 15+)	At Work	Unemployed	Student	Look after Home	Unable to Work	Retired	Other
Ringaskiddy (383)	183 (47.8%)	40 (10.4%)	57 (14.9%)	44 (11.5%)	20 (5.2%)	38 (9.9%)	1 (0.3%)
Shanbally (243)	112 (46%)	27 (11%)	28 (11.5%)	21 (18.8%)	20 (8.2%)	16 (6.6%)	0 (0%)
Carrigaline (8,740)	4,994 (57.1%)	829 (16.6%)	1,107 (22.2%)	845 (16.9%)	302 (3.5%)	649 (7.4%)	14 (0.2%)
County Cork (307,796)	164,441 (53.4%)	28,603 (9.3%)	32,611 (10.6%)	31,071 (10.1%)	12,390 (4%)	37,612 (12.2%)	1,068 (0.4%)
State (3,608,662)	1,807,360 (49.3%)	424,843 (11.6%)	408,838 (11%)	399,918 (10.9%)	156,993 (4.3%)	457,394 (12.5%)	13,316 (0.4%)

Table 5.6: Travel Time to Work and Education

Area	Total Travelling	Under ¼ hour	% under ¼ hr	Under ½ hr	% Under ½ hr
Ringaskiddy	282	118	42%	83	29%
Shanbally	209	75	36%	69	33%
Carrigaline	7,783	2,725	35%	2,618	34%
County Cork	241,324	83,940	35%	73,290	30%
State	2,704,404	921,724	34%	812,773	30%

5.3.7.3 Housing Stock:

Ringaskiddy and Shanbally are small residential settlements with a limited housing stock (Table 5.7). The 2011 Census data states that Ringaskiddy has a total of 241 houses, of which 46 were vacant at the time of the Census (19%); Shanbally has 117 houses, of which 4 were vacant (3%). The closest large settlement is Carrigaline, which has a housing stock of 4,362 houses, of which 220 were vacant (5%). On Census night the vacancy rate in Cork County was 15.8% and the vacancy rate in the state was 14.5%.

The vacancy rate in Ringaskiddy is somewhat higher than the county or state averages, or compared to the nearby settlements of Shanbally and Carrigaline. Such a strong vacancy rate can sometimes indicate a high percentage of holiday homes, or the presence of newly built housing which has not been sold (i.e. 'ghost estates'). Neither is the case in Ringaskiddy, as it is not a holiday location and it did not experience any significant residential growth during the development boom years. This suggests that Ringaskiddy village does not have a strong housing market in the context of Cork County, which can be explained by the settlement's strategic designation as an area for large scale industrial development.

Table 5.7: 2011 Housing Stock:

Area	2011 Housing Stock	2011 Vacant Houses	Vacancy Rate
Ringaskiddy	241	46	19%
Shanbally	117	4	3%
Carrigaline	4,362	220	5%
County Cork (excludes City)	172,042	27,161	15.8%
State	1,994,845	289,451	14.5%

5.3.7.4 Demographic Summary

In summary, there is a relatively small residential population within Ringaskiddy, and the presence of the student residence (36 units, with capacity for circa. 216 people) and the temporary accommodation linked to Ringport Business Park (16 units) are significant in relation to the overall population. While the 2011 Census data indicates a population of 478 it is likely that a relatively high proportion of this population are resident for a temporary period, linked to further education or employment within Ringport Business Park. The residential property market in Ringaskiddy is relatively weak, with a high vacancy rate and some dereliction evident within the housing stock.

Shanbally is also a small residential community, but is a more settled community; more consistent with county and state averages in relation to household structures. It would appear to have a relatively strong housing market, with a vacancy rate significantly lower than county or state averages.

5.4 Impact Assessment and Proposed Mitigation Measures

The potential impacts of the proposed redevelopment on human beings are assessed under the following headings:

- Economic Activity
- Social Considerations
- Land Use
- Health and Safety

Under each heading consideration is give to the 'Do Nothing Scenario', i.e. assuming that the development did not proceed; 'Construction Impacts'; and 'Operational Impacts'. Proposed mitigation measures are then outlined; and 'Residual Impacts' assessed.

5.4.1 Economic Activity

A report on the socio-economic impact of Ringaskiddy Port Redevelopment has been prepared and is provided in EIS Volume III a - Appendix 2.1. Key findings of this report are referenced within this section as 'The Indecon Report'.

5.4.1.1 Economic Activity - Do Nothing Scenario

The consequence of a 'Do Nothing' scenario would be that the Port of Cork would continue to operate from its existing locations, handling freight, cargo and passenger traffic on a commercial basis. In the short term Port activities at existing locations would intensify to respond to economic demands, within the parameters of existing relevant Harbour Works Orders and planning permissions. This intensification of activity would result in a growth in throughput of all trades and a consequential increase in traffic flows, albeit at a lower trajectory than could be facilitated by the proposed Ringaskiddy redevelopment.

While in the short term some intensification and economic growth would be achievable in the 'Do Nothing' scenario, there would be significant long term and wide reaching negative impacts related to competitiveness; regional economic growth; sustainable transport patterns (discussed in Chapter 8); and strategic spatial development objectives (discussed in 5.4.3, Land Use).

Competitiveness:

International shipping patterns are changing, particularly in the container trade – with vessels becoming much larger in terms of length and draft to respond to higher trade volumes and provide greater efficiencies in shipping. The physical constraints of the Jack Lynch tunnel, depth of channel and width of the river at the Tivoli and City Quays sites mean that larger ships cannot be accommodated. As a consequence trade will either have to continue to utilize smaller ships, with a higher unit cost; or trade will be lost to other ports which can accommodate larger vessels (such as Dublin). The competitiveness of Port of Cork activities would be compromised. This would have a consequential impact on the competitiveness of commercial activities in the South West Region which are reliant on port trade.

The Indecon Report estimates that if the Port of Cork fails to respond to the wider port sector developments, in particular the trend towards larger container vessels, then it would start to lose trade and larger unitized freight customers from around 2022 onwards, with losses increasing over time. Table 5.8 estimates the overall present value of future loss in the value of trade handled by Port of Cork, once capacity is reached and additional over-capacity trade must be handled at other ports.

Table 5.8 Estimated Scenario Projections of Present Value Loss of Trade at Port of Cork

	Present Value of Future Loss of Trade Relative to 'No Development' Scenario over period to 2033 - € Millions*
No Development versus Baseline Development Scenario	-22,768
No Development versus Lower Growth Development Scenario	-21,143
No Development versus Higher Growth Development Scenario	-25,707

It is estimated that the overall value of this loss in trade from the Port of Cork could total between €21.1 billion and €25.7 billion in present value terms over the period to 2033.

Having trades located at a number of locations in the Cork Harbour also means reduced economies of scale and increased logistical costs for port operations, again compromising the competitiveness of the Port of Cork.

The 'Do Nothing' scenario therefore means that the competitiveness of the Port of Cork would decline in the medium to longer term, with either higher unit costs, or loss of trade to other ports in the country; and consequential increase in costs for companies reliant on port trade in the South West Region.

Regional Economic Growth:

Cork is designated as a Gateway in the National Spatial Strategy with the objective to act as an engine of regional and national growth. The South West Region is projected to grow to a population of 795,000 by 2022 (an increase of 173,870 people on 2006 figures), with employment growth requirements of around 50,000 to 60,000 to support this population growth. The Indecon Report estimates the value of trade handled by the Port of Cork in 2012 was €13,934m, which supported an estimated 171,787 full time equivalent (FTE) jobs.

Efficient and competitive international shipping is a critical factor in supporting the economic growth of any region, and in particular regions located within an island economy. Any compromise to the competitiveness of the Port of Cork will undermine the vitality and economic growth targets for Cork Gateway and the South West Region. The Port of Cork serves a catchment area which represents a large and strategically important part of the State's population and economic base. Almost two-thirds of the Port's customers are located in Cork, while over 70% are in the South West region and 92% in Munster. The capacity of the Port of Cork to efficiently and competitively serve the needs of these customers has a direct impact on the viability and profitability of individual companies and consequently the economic vitality of Cork and the wider region.

The Indecon Report undertook research on the views of multinational and indigenous companies on potential implications arising from the failure to address future capacity requirements of the Port of Cork. The majority of businesses surveyed believed the greatest repercussions would arise from having to divert their sea-based trade to alternative ports, which would result in a loss of economic competitiveness in the Cork region; increase the overall costs of transporting goods to / from the Cork regional; undermine the attractiveness of the Cork region for future investment and job creation; lead to increased environmental costs associated with transportation of goods; and undermine the potential for re-development of the Cork Docklands; as well as increase the overall costs of transporting goods to / from Ireland as a whole.

The 'Do-Nothing' scenario would therefore have negative impacts on the potential of the region to deliver its population and associated employment growth targets; it would have a negative impact on the economic vitality of existing businesses located within the region and undermine the attractiveness of the Cork region for future investment.

Ten-T Connectivity

The Port of Cork's 2010 Strategic Development Plan Review has been accepted as being aligned with the Trans-European Transport Network (TEN-T) principles. The do nothing scenario would lose the potential TEN-T connectively advantages and efficiencies, with the loss of future funding opportunities to develop the Port's infrastructure.

The Do-Nothing scenario would therefore have negative impacts on the potential of the Port of Cork to be connected to the Trans-European Transport Network, with consequential negative impacts on the integration of the South West Region to the rest of Europe.

5.4.1.2 Economic Activity - Construction Impacts

Potential construction impacts arise from a range of issues discussed elsewhere in this EIS: Traffic Transportation (Chapter 8); Noise and Vibration (Chapter 9); and Air Quality and Climate (Chapter 10). Potential impacts on economic activity not discussed elsewhere relate to the direct employment of construction workers and indirect economic activity generated by the construction process.

Direct Employment & Indirect Economic Activity

Construction activities relate to Ringaskiddy East and Ringaskiddy West, with proposed phasing as detailed in Chapter 3 of the EIS. Table 5.9 details the estimated capital expenditure; labour expenditure and full time equivalent jobs (FTEs) related to the proposed redevelopment.

Table 5.9 Estimated Construction Employment

Development	Estimated Capital Expenditure - € million	Estimated Labour Component of Capital Expenditure	Estimated FTE Jobs per €1m of Construction Labour Spend	Implied Direct Construction Phase FTEs	Economy-wide FTEs (Direct & Indirect/ Multiplier Impacts)	Implied Economy-wide Incomes Supported - €million
Ringaskiddy East	88.7	29.6	25 FTEs	739	1,282	51.2
Ringaskiddy West (Deep Water Berth)	13.2	4.4	25 FTEs	110	191	7.6
Full Development Proposals (Ringaskiddy East & West)	**101.9**	**34.0**	**25 FTEs**	**849**	**1,473**	**58.8**

The total construction capital expenditure of the proposed redevelopment is €101.9m, with an estimated 849 direct FTE construction jobs. Combined direct and indirect FTE jobs are estimated to be 1,473 with an implied economy wide income support of €58.8 m as a result of the construction process.

The proposed redevelopment will therefore have a moderate, positive, short-term impact on direct and indirect construction employment; construction suppliers and associated economic activity.

5.4.1.3 Economic Activity - Operational Impacts

Potential operational impacts arise from a range of issues discussed elsewhere in this EIS Landscape & Visual (Chapter 7); Traffic & Transportation (Chapter 8); Noise & Vibration (Chapter 9); Air Quality & Climate (Chapter 10).

Potential impacts on economic activity not discussed elsewhere relate to the relocation of upper harbour activities; direct employment and indirect economic activity.

Relocation of Upper Harbour Activities

The proposed redevelopment will facilitate the relocation of some bulk goods cargo from the City Quays and container activities from Tivoli. The relocation of these activities is a major step forward in facilitating the development of Cork Docklands and Tivoli for mixed use development, consistent with national, regional and local spatial planning policies. Paragraph 5.58 of the 2009 Cork City Development Plan notes that:

> "*The Port of cork proposes to relocate container traffic downstream to Oyster Bank and to relocate bulk & other trade from the city quays. This will provide for major regeneration and development opportunities at the Docklands and Tivoli*".

The relocation of container activities from Tivoli will free up approximately 150 hectares of land for potential development. Some non-port related activities and businesses would remain on the site at Tivoli, pending their independent commercial decision on whether to relocate.

The relocation of port trades and will act as a significant catalyst for the redevelopment of the City Quays and Tivoli sites and will have a significant, positive, permanent impact on the development of Cork City and consequently the county.

Direct Employment & Indirect Economic Activity

The proposed redevelopment will facilitate the relocation of existing operations from the upper harbour; consolidation of bulk goods cargo handling and greater efficiencies in port operations. It is projected that there will be no increase in employment during the operational phase in the short term. As trades are relocated there will be a requirement to redeploy staff from Tivoli and the City Quays to Ringaskiddy. It is projected that ultimately 68 workers will be redeployed from Tivoli to Ringaskiddy; and 7 will be redeployed from the City Quays, as detailed in Table 5.10.

Table 5.10: Redeployment of Workers to Ringaskiddy

Tivoli	
Tivoli Operations Personnel at present	23
Maintenance General Tivoli	5
Stevedores / Checkers – Tivoli	5
Engineering Services Tivoli	10
Non POC (e.g. Shipping Agents / Lines) Tivoli	25
Total Tivoli moving to Ringaskiddy	68
City Quays (CQ)	
City Quays moving to Ringaskiddy	7
Ringaskiddy	
Operations Personnel at present	12
Engineering Services Ringaskiddy	5
Engineering Services – Various Locations	5
Total moving to Ringaskiddy (Tivoli and CQ)	75

Available figures for 2012 suggest that overall Port operations support about 600 FTEs - between the Port of Cork and wider service providers linked with the port's activities (stevedoring, haulage and other service providers, but excluding ferry and cruise activities). As port trades grow there may be a need to increase direct employment by the port, and there will be a related growth in employment linked to the port's activities. Table 5.11 provides projected Scenarios for Port Operational Impacts on Employment (assuming 0.5 elasticity; and 0.8 elasticity).

Table 5.11: Scenarios for Port Operational Impacts on Employment

		Scenarios based on Baseline Extension Trade Projections and Alternative Elasticities w.r.t. Trading Volumes							
	Actual	0.5 elasticity				0.8 elasticity			
	2012	2018	2023	2028	2033	2018	2023	2028	2033
Port Operational Employment Supported – Direct (POC, Service Providers, excluding Ferry & Cruise) – FTEs	601	648	692	737	785	676	718	764	815
Employment Supported – Economy wide FTEs	838	904	964	1,028	1095	943	1,001	1,066	1,136

The operational phase of the proposed redevelopment is therefore considered to have a slight, positive, medium term impact on direct port related employment; growing to a moderate positive long term impact as trade activity grows.

In terms of indirect economic activity, the proposed redevelopment is essential to support the regeneration and growth of the economy in the South West Region. Economic development policy emphasises that the provision of excellent port infrastructure is essential to develop and maintain economic growth and national competitiveness. The Port of Cork services a wide area in South West Ireland and ensures that business and industry in the region have good access to international import and export services. The proposed redevelopment will ensure that these services are maintained and can grow in line with economic growth demands from the region. The Indecon Report has estimated the economic impact of the proposed Ringaskiddy Port Redevelopment on the value of trade and employment supported by this trade. Table 5.12 shows that it is estimated the value of trade will grow from €13,937m in 2012; to €20,614m by 2023; and to €28,741m by 2033. The associated employment supported from this trade is estimated to grow from 171,787 in 2012; to 254,089 in 2023 and to 354,256 in 2033.

Table 5.12 Economic Impact of Proposed Ringaskiddy Port Re-development – Estimated Impact on Value of Trade Handled by Port of Cork and Employment Supported by Trade.

	2012 Actual	2023 Estimate	2033 Estimate
Estimated Value of Trade at Port of Cork (Baseline Development Extension Scenario) Assuming Annual Growth in Average Value of Trade @ 2.5% per annum - € Million	13,937	20,614	28,741
Estimated Employment Supported from Trade Handled by Port of Cork – Economy-wide FTEs	171,787	254,089	354,256

Consequently, the operational phase will have a significant, positive, permanent impact on the economic activity of the region.

5.4.1.4 Economic Activity – Proposed Mitigation

No negative impacts on economic activity have been identified; therefore no mitigation measures are required.

5.4.1.5 Economic Activity – Residual Impacts

No negative residual impacts in relation to economic activity have been identified.

5.4.2 Social Considerations

Social considerations relate to whether the development will change patterns and types of activity and land use. In this context it is necessary to consider potential impacts on recreation and amenity; and on non-commercial activities that may be affected by the proposed redevelopment. Potential social and community receptors have been identified as being: residential population; schools; third level education & research facilities; childcare facilities; community facilities; churches and cemeteries; land zoned for recreation or amenity uses.

The relevant character of impacts on social considerations are considered to be; landscape changes; pier relocation; existing moorings; and the development of lands to the east of the site and population change.

5.4.2.1 Social Considerations - Do Nothing Scenario

In a 'Do Nothing' scenario there will be some intensification of existing permitted activities within the boundary of the site. However it is considered that any intensification of existing activities would have no impacts on social considerations.

5.4.2.2 Social Considerations - Construction Impacts

Potential construction impacts relating to traffic; noise & vibration; and dust are assessed in chapters 8, 9 and 10 respectively. In terms of additional social considerations the development will result in a number of changes to existing recreation and amenity provisions within Port lands and in the harbour. These will involve:

- Relocation of existing Sculpture Garden
- Loss of access to Ringaskiddy pier and slipway and the development of a new facilities at Paddy's Point Amenity Area
- Development of lands at Ringaskiddy East

Mitigation measures will be put in place during the early stages of the construction process. The impacts and mitigation measures are considered further under 'Operational Impacts'.

No other construction impacts related to social considerations have been identified; therefore no other mitigation measures are required.

5.4.2.3 Social Considerations - Operational Impacts

Landscape Changes

Landscaping of the proposed redevelopment is detailed in Chapter 7 - Landscape & Visual. The existing Sculpture Garden (Plate 5) will be relocated as part of the works to Ringaskiddy East. The Sculpture Garden, which was commissioned by the Port of Cork, forms part of the landscape setting of the ferry terminal with limited wider social amenity benefit. It is to be relocated to a more public location, in consultation with the original artist (Vivienne Roche).

Relocation of the Sculpture Garden will have a moderate neutral permanent impact on recreation and amenity.

Ringaskiddy Pier & Slipway

The proposed redevelopment will result in the existing pier and slipway being closed to the public. Without appropriate mitigation measures this would have a significant, negative permanent impact on recreation and amenity. It is, however, proposed to develop an additional slipway and pier to the east of the village (at Paddy's Point Amenity Area), adjacent to the NMCI and the future IMERC development. The new slipway and pier will be easily accessible, with improved parking facilities and provision for boat storage. It will be publicly accessible and be in place before the old slipway and pier is decommissioned. Paddy's Point Amenity Area will be well landscaped, with enhanced facilities for casual amenity and will complement proposed redevelopments of a county park at Haulbowline Island; and the proposed IMERC development immediately south of the site. Hydraulic modelling was

undertaken to ensure the efficacy of the new pier and slipway in relation to localised tidal patterns and current streams.

Closing access to Ringaskiddy pier and slipway and development of a new pier and slipway at Paddy's Point Amenity Area will have a moderate neutral permanent impact on recreation and amenity.

Existing Moorings

There are 6 established moorings in Ringaskiddy, which will remain in their current location. The moorings are currently accessed from Ringaskiddy pier and slipway. This access will no longer be available and will be replaced by access from Paddy's Point Amenity Area. There is a slight increase in the distance from the moorings to the new pier and slipway. However, Paddy's Point Amenity Area will have improved parking and facilities for boat storage. On balance it is considered that the operational phase of the development will have a negligible negative impact on the use of the moorings.

Development of lands to East

The lands to the east of the Ringaskiddy Basin are currently undeveloped and consist of scrublands which are used on an informal basis by some local residents for walking. This informal walk will no longer be accessible following development of Ringaskiddy East. There are other walking routes in the area, including Gobby Beach, which is located approximately 2km to the east of the site.

Mitigation measures proposed are the provision of a well landscaped site at Paddy's Point Amenity Area which is close to the walk at Gobby Beach.

The loss of access to the informal walk at Ringaskiddy East will have a moderate negative permanent impact on recreation and amenity.

Population Change

Ringaskiddy village is designated as a strategic employment area, with no population growth targeted within the Council planning policy framework. Analysis of the existing demographics has indicated that there is a relatively small existing residential population in Ringaskiddy (< 500) and that the housing market is relatively weak, with a high vacancy rate and some dereliction evident within the existing stock.

The proposed redevelopment will require the redeployment of approximately 75 employees from the existing port sites in Cork to Ringaskiddy. This is a relatively small number of employees and it is considered unlikely that they will relocate to live within the village, or surrounding settlements, as commuting times from Cork City to Ringaskiddy are relatively short (20 to 30 minutes). It is anticipated, therefore, that the proposed redevelopment will have no impact on population change of Ringaskiddy village or surrounding settlements.

5.4.2.4 Social Considerations – Mitigation Measures

The loss of public access to Ringaskiddy pier and slipway has been identified as a potentially significant negative impact. Accordingly the proposed redevelopment incorporates proposals for the development of a new facility 'Paddy's Point Amenity Area', with enhanced parking and landscaping; and provision for open boat storage, to the east of the village. The Amenity Area will include informal access to the shoreline.

No other significant negative impacts on social considerations have been identified; therefore no other mitigation measures are required.

5.4.2.4 Social Considerations – Residual Impacts

The residual impacts, following implementation of mitigation measures, will be a moderate negative impact due to the loss of access to the informal walk at Ringaskiddy East and a negligible negative impact on the use of existing moorings at Ringaskiddy.

5.4.3 Land Use

The proposed redevelopment is on lands currently zoned as 'Industry' within Carrigaline Electoral Area Local Area Plan; and includes limited reclamation of the harbour (see Zoning Map in Carrigaline LAP). The uses on the lands consist of current port and port related activities; access roads; slipway and unused scrub lands (incorporating an informal walk). There are no existing way-leaves or rights of way on the landholding, although there is informal public access to the slipway and scrub lands.

5.4.3.1 Land Use - Do Nothing Scenario

The strategic spatial development objectives for the South West Region target future population and growth to the Cork Metropolitan area, with a strong reliance on the redevelopment of Cork Docklands to achieve the targets. This is carried forward into 2009 Cork City Development Plan, which has an objective to grow the city's population to 150,000 by 2020. Paragraph 2.27 of the City Development Plan notes:

> *"The regeneration of the City Centre and the development of a new urban quarter in Docklands are the key development opportunities for the city."*

One of the primary objectives of focusing development on the Cork Docklands is to promote sustainable patterns of development, reducing the need for commuting and ensuring economies of scale in terms of the delivery of retail, social and community facilities. The development of Cork Docklands cannot be fully realised unless the Port of Cork activities are relocated from both the City Quays and Tivoli.

The 'Do Nothing' scenario would, therefore, result in stifling the strategic spatial development objectives for the South West Region and limiting the potential of development land within Cork City. The 'Do Nothing' scenario would therefore result in a significant, negative, long-term impact on land use.

5.4.3.2 Land Use - Construction Impacts

Construction Access

Construction access to the site will be via the existing port access road. There will be no change to existing land use to accommodate construction access; therefore there is no impact on land use.

Construction Site Establishment

The construction site establishment will include site office; secure compound for storage of materials and plant; temporary vehicle parking area; and storage for excavated materials, prior to off-site disposal. It will be located on land currently undeveloped and used as temporary open storage, with no existing way-leave; right of way or amenity use. The construction site establishment will therefore have a moderate, neutral short term impact on land use.

5.4.3.4 Land Use - Operational Impacts

The operational phase of the proposed redevelopment will incorporate intensification of existing port area; reclamation of some of the harbour area; and the storage of containers on lands to the east of the proposed new quay wall at Ringaskiddy Basin East.

The reclamation of areas of the harbour will result in a change to the physical structure of the area from 'port operation waters' to 'port operation lands'. While there is a physical change from water to land, the use of the area will remain 'port operations' and it is considered that there is a significant neutral permanent impact in relation to 'land' use.

The storage of containers on lands to the east of the new quay wall will result in the long term change of land use, from the existing undeveloped scrub land, to active industrial use. In relation to the zoning provision of the land, this provides for a more intensive and appropriate land use and is therefore a moderate positive long term impact.

5.4.3.5 Land Use – Proposed Mitigation

No negative impacts have been identified in relation to land use; therefore no mitigation measures are required.

5.4.3.6 Land Use – Residual Impacts

As no mitigation measures are required, there are no residual impacts to consider.

5.4.4 Health & Safety

Health and Safety issues of the proposed redevelopment relate to construction safety; operation of plant and machinery; storage of bulk goods and containers; rodent control; and road and shipping safety.

5.4.4.1 Health & Safety - Do Nothing Scenario

In a 'Do Nothing' scenario there may be some intensification of existing permitted activities within the boundary of the site. Any intensification of activities will be controlled by the port's existing health and safety procedures and no negative impacts are predicted in relation to land based activities.

5.4.4.2 Health & Safety - Construction Impacts

During the construction phase, health & safety risks will arise from construction activities, including blasting and operation of heavy plant and machinery. A construction related accident could result in injury or death to construction workers; port employees or visitors to the port site. Construction safety will therefore be closely controlled by the development and implementation of construction safety arrangements. A Project Supervisor, Design Process (PSDP), will be appointed at tender stage to coordinate the design effort and to address and minimise construction risks during the detailed design period. Notification of this appointment will be sent to the HSA by means of their Approved Form 1 (AF1).

As design advances and before construction commences, a Preliminary Health and Safety Plan will be drawn up by the PSDP and reviewed by the project team. This ultimately will be passed on to the appointed Project Supervisor Construction Stage (PSCS) to be developed into a Construction Health and Safety Plan, prior to construction commencing. Notification of this appointment and the commencement date of construction will be sent to the HSA by means of their Approved Form 2 (AF2).

With Health & Safety procedures in place, construction activities will have a negligible, neutral, short term impact on health and safety.

5.4.4.3 Health & Safety - Operational Impacts

During the operational phase of the proposed redevelopment health and safety impacts will be related to port operations; pest control; and road and sea traffic. Potential receptors are port employees; workers of other companies based at the port; visiting contractors and workers; ferry passengers; harbour users; casual visitors to port lands; and traffic, pedestrians passing the port entrance.

Port Operations

The main health and safety risks during the operational phase of the proposed redevelopment arise from the operation of plant and machinery; the storage of bulk goods and movement and storage of containers on the port lands.

Health and Safety activities for port operations are guided by national Health & Safety legislation. The Port of Cork is also OHSAS 18001 Safety System and ISO 14001 Environmental System compliant. These are internationally recognised Health, Safety & Environmental voluntary quality standards. The

Port's Safety Officer, Mr Henry Kingston, is responsible for ensuring compliance with these safety procedures.

The project design has taken cognisance of necessary health and safety requirement for port operations and has minimised any increased health and safety risk associated with the development. In addition the Port's existing Health & Safety procedures will be reviewed to take account of the increased operations at Ringaskiddy. Consequently, increased port operations will have negligible, neutral permanent impact on health and safety.

Pest Control

The storage of certain bulk goods on shore and the importing of international cargo have an associated risk of rodent and other pest nuisance. The Port of Cork operates an 'Integrated Pest Management' approach to pest control. This process anticipates and prevents pest activity and infestation by education; inspection of imported cargo; proper waste management; maintenance of bulk storage areas and pesticide application when necessary.

The proposed redevelopment will increase trade activity at Ringaskiddy and increase the amount of bulk goods storage on shore. Accordingly there is an associated increased risk of pest nuisance, which if not mitigated could have a negative impact in relation to health and safety. Continued implementation of the Port's 'Integrated Pest Management' procedures will, however, ensure that no additional risks of pest nuisance arise as a result of increased trade. The HSE is responsible for monitoring of pest management at the port and is reviewing procedures in the context of the proposed redevelopment. Any recommendations of the HSE will be fully complied with, consequently, in relation to pest control; the proposed redevelopment will have a negligible, neutral permanent impact on health and safety.

Sea & Road Traffic

There is a potential enhanced risk of accidents related to the increase in road and sea freight traffic. The design of the proposed redevelopment and implementation of existing road and sea traffic management operational procedures will ensure that increased traffic has no negative impact on health and safety.

Consequently, in relation to sea and road traffic, the operational phase of the proposed redevelopment will have a negligible, neutral permanent impact on health and safety.

5.4.4.5 Health & Safety – Proposed Mitigation

Construction Activities

In accordance with current legislation and in order to prevent and minimise construction activity accidents, a Project Supervisor Design Process (PSDP) will be appointed at detailed design stage. As the design advances but before construction commences a preliminary Health and Safety Plan will be drawn up by the PSDP and reviewed by the project team.

During construction all areas will be delineated and will be under the control of the Project Supervisor Construction Stage (PSCS) who will coordinate and supervise all safety aspects of the project. A Safety File will be complied and maintained on site for the duration of the project and the implementation of the Plan will be subject to regular audits.

Strict security procedures are already in place on site to deal with all access on a 24 hour basis. These procedures require all vehicles and personnel visiting the site to be logged.

Operational Activities

No negative impacts on Health & Safety have been identified by the operational phase of the proposed redevelopment; therefore no further mitigation measures are required.

5.4.4.6 Health & Safety – Residual Impacts

No negative residual impacts in relation to health and safety have been identified.

5.5 Cumulative Impacts

A planning history review was undertaken to identify any recently approved or pending developments which may have a cumulative impact on Human Beings.

The significant developments in terms of impacts on Human Beings relate to the application for development of Haulbowline Island as a public park (ABP ref: MT0001); permission for the development of Community Children's playground within Ringaskiddy Village (13/6054); and a number of applications for expansion of existing commercial and industrial activities in Ringaskiddy.

The development of Haulbowline Island as a public park will have a significant positive impact on the immediate surroundings and the environs of the harbour. The proposed redevelopment of a new slipway and pier at Paddy's Point Amenity Area will have a positive cumulative impact with the proposed redevelopment as it will enhance amenities within the immediate locality and provide a location for small craft to launch close to the proposed new park.

The permitted community playground is located to the west of the current access to the ferry terminal, on land which is currently grassed open space. The permitted development will enhance the residential amenity of the open space. The Port of Cork's proposed redevelopment will remove port related traffic from the main street in the village. Therefore the cumulative impact of the developments will be a significant improvement in residential amenity within the main street of the village.

The permitted applications for extension to existing commercial and industrial facilities in the area will consolidate Ringaskiddy's role as a strategic employment location. Cumulatively the continuing development of commercial, industrial and port activities will have a significant positive impact on the economic vitality of Cork and its Region.

5.6 Summary of Impacts and Mitigation Measures

5.6.1 Economic Activity

A 'Do-Nothing' scenario would undermine the competiveness of the Port of Cork; resulting in negative impacts on the economic vitality of existing businesses with the South West Region, undermining its attractiveness for future investment. A 'Do-Nothing' scenario would also have negative impacts on the potential of the Port of Cork to be connected to the Trans-European Network, with consequential negative impacts on the integration of the South West Region to the rest of Europe.

The proposed Ringaskiddy redevelopment will have a positive impact on economic activity during both construction and operational phases. It is estimated that the construction phase will require a total of 849 Full Time Equivalent (FTE) jobs, as well as having significant indirect economic impacts, which will result in a moderate, positive, short-term impact on economic activity.

During the operational phase the relocation of port trades from the upper harbour will act as a significant catalyst for redevelopment of City Quays and Tivoli sites. The Ringaskiddy redevelopment will allow the Port of Cork to remain competitive within national and international markets, supporting the economic growth of the region. While there will be no immediate increase in direct employment, as trade grows there may be a need to increase direct employment and there will be a related growth in indirect employment. The operation phase of the redevelopment will have a significant, positive, permanent impact on economic activity of the region.

No negative impacts on economic activity have been identified therefore no mitigation measures are required.

5.6.2 Social Consideration

Potential negative impacts on social considerations are the need to relocate the Sculpture Garden located within Port lands; the loss of access to Ringaskiddy Pier and Slipway; change of access to existing moorings; and the development of lands at Ringaskiddy East, currently used as an informal walk.

Proposed mitigation measures are:

- Relocation of the Sculpture Garden to another site in Ringaskiddy in consultation with the original artist, which will have a moderate neutral permanent impact.
- Development of Paddy's Point Amenity Area to the east of Ringaskiddy, including a new pier and slipway which will have a moderate neutral permanent impact.
- The new pier and slipway will be used to access existing moorings. There is a slight increase in distance from the moorings to the new pier and slipway; but parking and boat storage facilities will be improved. On balance it is considered that there will be a negligible negative permanent impact on existing moorings.

The new Paddy's Point Amenity Area is close to Gobby Beach and will enhance recreation and amenity facilities at the east of the village. The loss of access to the informal walk at Ringaskiddy East will have a moderate negative permanent impact on recreation and amenity.

5.6.3 Land Use

A 'Do-Nothing' scenario would stifle the strategic spatial development objectives for the South West Region, as development of lands at City Quays and Tivoli would be stifled, resulting in a significant, negative, long-term impact on land use.

No negative impacts have been identified in relation to land use therefore no mitigation measures are required.

5.6.4 Health & Safety

The main health and safety risks related to proposed redevelopment arise from construction activities; the operation of plant and machinery; the storage of bulk goods and movement and storage of containers on the port lands. Health and Safety procedures will be followed during construction and operational phases of the redevelopment, therefore no negative impacts were identified and no further mitigation measures required

6.0 CULTURAL HERITAGE

6.1 Introduction

The Port of Cork proposes to undertake works in Ringaskiddy East and Ringaskiddy West that include new quay walls, capital dredging and improvements to the road system and related surface facilities. An aerial view of the Port of Cork Lands at Ringaskiddy is shown in Figure 6.1. All figures accompanying this Chapter are contained in EIS Volume II. All appendices accompanying this Chapter are contained in EIS Volume III a. The redevelopment proposals are described in Chapter 3 of this EIS.

RPS appointed the Archaeological Diving Company Ltd. (ADCO) to carry out the cultural heritage assessment. Cultural Heritage assessment seeks to identify and record the location, nature, and dimensions of any archaeological and architectural features, fabric or artefacts that may be impacted by a development's proposed works. Assessment includes an examination of existing sources and the acquisition of new data arising from site inspections and surveys. The assessment gauges the level of development impact, and includes detailed recommendations for the mitigation of any archaeology present within the development area. ADCO has considerable experience in this type of work, and has carried out many intertidal and underwater surveys in Cork Harbour, including work at Ringaskiddy. For the present study, a comprehensive review of existing sources was completed, and extensive new data sets have been acquired based on non-intrusive survey and recording above and below the waterline.

6.2 Assessment Methodology

A sequence of work has been completed to ensure that the Cultural Heritage assessment has been comprehensive and robust. The work has included a desktop study of known archaeological and architectural sources, while marine geophysical survey and archaeological dive inspection conducted in 2005-06 provide a robust foundation for a phase of additional inspection conducted in 2012 and 2014.

6.2.1 Consultations

- The *Irish Antiquities Division of the National Museum of Ireland* (NMI) retains an extensive archive of small finds and objects discovered across Ireland and reported to the Museum and its predecessors since the nineteenth century. It represents a critical resource for archaeological research, where registered objects are recorded by townland in the Topographical Files. For the present project, the following townlands were assessed: Barnahely; Ballybricken; Ringaskiddy.

- *Department of Arts, Heritage and the Gaeltacht* (DAHG) *Sites and Monuments Record files*. The information, which is also filed according to townland, provides details relating to specific monuments and sites of archaeological importance that survive or whose site area is recorded. The record generally includes only sites that pre-date *c.* 1750 AD.

- *DAHG's Historic Shipwreck Inventory files* and *Places and Ports archive*. This information relates to the archives maintained by the National Monuments Section's Underwater Archaeology Unit for shipwreck and other maritime sites of archaeological interest. The information is located with reference to the nearest topographic locator, such as a town or headland, as well as site-specific grid coordinates where known. For the present project, the following landmarks were considered to be relevant: Monkstown Creek; Ballybricken Point; Ring; Ring Island; Ring Point; Ringaskiddy; Ringaskiddy Island; Paddy's Point; Rocky Island; Oyster Bank; Golden Rock.

- *National Inventory of Architectural Heritage (NIAH)*. The DAHG provides an online register of historic buildings and features/street furniture that retain architectural heritage interest, and is maintained by the DAHG's architectural section. The Inventory is organized by place and townland. The Inventory complements the archaeological inventories by including buildings and features that date from the eighteenth century and more recently.

In addition, the following sources have been consulted:

- *Cartographic sources*, including Admiralty Charts (Chart 1777) and Ordnance Survey First and Second Edition maps (6-inch Sheet Cork 87). Historic and current topographical maps represent very important sources that can reveal the progress of natural erosion and human development across a landscape/seascape over time. Such mapping in Ireland is metrically accurate from the mid-late nineteenth century;

- *Office of Public Works (OPW)* Piers and Harbour Structures files, 1708-1922 (OPW/8). This body of state records refers to port improvement works across the country and forms part of the National Archives collection;

- *Excavations Bulletin* is an annual published list of licensed archaeological intervention work conducted across Ireland. It is arranged by county and then by townland, and is currently completed to 2010;

- Relevant published sources.

6.2.2 Data Acquisition

The desktop review included a review of historic mapping that can reveal the development of the landscape over time, an examination of existing archival information at the NMI and the DAHG in relation to the known archaeological objects and features and sites of archaeological and architectural interest, and a review of archaeological work conducted in the immediate vicinity of the project area from published and unpublished sources. The information combines to establish a baseline data source.

A programme of marine geophysical survey conducted in 2005 and archaeological diver inspection carried out in 2006, conducted under licence from what is today the DAHG, provide a robust set of data commissioned by the Port of Cork for cultural heritage assessment at Ringaskiddy. Additional new primary project-specific data was acquired in 2012 and 2014 to complement the earlier data sets.

The baseline data and the factual observations made in the on-site surveys are presented in detail in Appendices 6.1 and 6.2 (See EIS Volume III a).

6.2.3 Legislation

The following legislation, standards and guidelines with particular reference to Archaeology were consulted for the purposes of this evaluation:

- National Monuments Acts, 1930-2004;
- The Planning and Development (Strategic Infrastructure) Act, 2006;
- The Heritage Act, 1995;
- Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, no date, NRA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, Department of Arts, Heritage, Gaeltacht and Islands (now DAHG);

- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000;
- Code of Practice between Bord Gáis Éireann and the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Department of Arts, Heritage and the Gaeltacht), 2002.

Limitations

The current report is based on desktop and non-disturbance on-site assessment only. No intrusive investigations or excavations have been carried out.

6.2.4 Classification of Impacts

Impacts are generally categorised as either being a direct impact, an indirect impact or as having no predicted impact:

Direct impact occurs when an item of archaeological or architectural heritage is located within the footprint of the proposed development and entails the removal of part, or all, of the monument or feature.

Indirect impact may be caused where a feature or site of archaeological or architectural interest is located in close proximity of the proposed development.

No predicted impact occurs when the proposed development does not adversely or positively affect an archaeological or architectural heritage site.

These impact categories are further assessed in terms of their quality i.e. positive, negative, neutral (or direct and indirect).

Negative Impact is a change that will detract from or permanently remove an archaeological or architectural monument from the landscape.

Neutral Impact is a change that does not affect the archaeological or architectural heritage.

Positive Impact is a change that improves or enhances the setting of an archaeological or architectural monument.

A significance rating for these impacts is then given i.e. slight, moderate, significant or profound.

Profound applies where mitigation would be unlikely to remove adverse effects. This is reserved for adverse, negative effects only. These effects arise where an archaeological or architectural site/feature is completely and irreversibly destroyed by a proposed development.

Significant is an impact that, by its magnitude, duration or intensity alters an important aspect of the environment. An impact like this would be where the site/feature or part thereof would be permanently impacted upon leading to a loss of character, integrity and data about the archaeological or architectural site/feature.

Moderate is a moderate direct impact that arises where a change to the site is proposed which, though noticeable, is not such that the archaeological integrity of the site/feature is compromised and which is reversible. This arises where an archaeological or architectural site/feature can be incorporated into a modern day development without damage and that all procedures used to facilitate this are reversible.

Slight is an impact that causes changes in the character of the environment that are not significant or profound and do not directly impact or affect an archaeological or architectural feature or monument.

Imperceptible is an impact capable of measurement but without noticeable consequences.

In addition, the duration of impacts is assessed and has been sub-divided into the following categories.

Temporary Impact, where an impact lasts for one year or less.

Short-term Impacts, where an impact lasts one to seven years.

Medium-term Impact, where an impact lasts seven to fifteen years.

Long-term Impact, where an impact lasts fifteen to sixty years.

Permanent Impact, where an impact lasts over sixty years.

6.3 Existing Environment

6.3.1 Overview

Ringaskiddy is located in Cork Harbour, approximately half way along the circuitous route that leads from the sea northward to Lough Mahon and Cork city (Figure 6.2). It is one of the series of natural havens that populate the edges of the wide harbour, and it is located to the west of where navigation can fork in two directions around Great Island. The maritime location defines the cultural heritage context of Ringaskiddy.

Material remains from the early stages of human occupation in Ireland have been discovered in Cork Harbour, and are manifested in a series of stone tools from the Mesolithic period which indicate the presence of Hunter-Gatherer-Fisher folk in the fourth millennium BC. At Ringaskiddy however the earliest indicators are somewhat later. Two coastal midden sites exist on the east shore overlooking the West Channel (Register of Monuments and Places [RMP], CO087-54 and -161; see Appendix 6.1 for descriptions of all sites mentioned in this overview). The middens are ancient low mounds or heaps of domestic waste, and may indicate the presence of ancient fishing places. More tangible prehistoric evidence was discovered during works associated with the N28 road scheme in Barnahely townland, when terrestrial geophysical survey revealed a complex of interlocking enclosure features indicative of unenclosed settlement sites that might be Bronze Age or Iron Age in date (RMP CO087-155. Figure 6.3 shows the location of the known archaeological monuments in the vicinity of the port complex). This relatively small area of landscape also retains sites that are more recent in date. The next significant evidence lies in Ballintaggart townland and is represented by a former ecclesiastical site (RMP CO87-061) belonging to the early medieval period (c. 500-1100 AD). The site does not survive above ground today, but it is thought to have been one of the principal church sites in the southwest. The medieval period is represented in Barnahely townland, where the ruined remains of a sixteenth-century tower house castle and its bawn survive (RMP CO087-052). Also known today as Castle Warren, the tower house was built by the De Cogans. The site lies close to and south of Barnahely Church (RMP CO087-051), whose visible remains date to the early 1700s, but which was undoubtedly associated with the castle.

A Martello tower (RMP CO087-053) was built on the highest point of Ringaskiddy promontory to the west, and represents the most prominent statement of the location's maritime heritage. The harbour had for long been strategically of great importance, and successive phases of defensive construction had been witnessed. As early as 1590, Sir George Carew, Master of the Ordnance in Ireland, observed that while 'Cork can hardly ever be fortified, yet upon the river, towards the sea, many convenient places may be found for annoying the shipping on the passage towards the town' The great batteries and star-shaped forts at Dognose, Ramhead, and Spike Island convey the conscious attempts to protect the Harbour against invasion. A bastioned fort was also built on Haulbowline Island in 1602 under the direction of the military designer Paul Ive, who was also responsible for the fortification work at Castle Ny Park, to protect Kinsale. The continued if episodic threat of invasion into the nineteenth century saw a rebuilding of the Harbour's coastal defences with the construction of its Martello Towers. Such towers are named after a successful engagement by the Royal Navy at Martello in Italy, where the attackers were impressed by the defensive towers, whose substantial form presented solid rebuttals to ship-borne artillery, and whose upper platforms provided superior gun platforms that could exploit a 360-degree rotation if needs be. The Navy studied the towers and absorbed their plan into their own coastal defence systems. They have become an iconic symbol of the Napoleonic era, and were built into the defences of Ireland's major harbours at the time. Under construction in 1812-15, the Ringaskiddy tower is the largest of the Martello towers constructed around Cork Harbour as a defensive network to protect against the possibility of a French invasion. Located on dry land to the south of Ringaskiddy East, the Ringaskiddy tower is positioned at the centre of a circular enclosure, and was associated with an avenue that was built from the tower to the shoreline, which would have served to convey ordnance. The proximities of the magazine (RMP CO087-105) stored on Rocky Island to the north of Ringaskiddy, and the slightly more distant fortifications on Haulbowline Island (CO087-059001-3), highlight the complex fortified landscape that Ringaskiddy was a part of at this time.

Haulbowline Island was known for its ship-building and was upgraded to a Naval Dockyard in 1869. The island was artificially enlarged to provide an open-water harbour protected by a breakwater that

effectively doubled its area. Ringaskiddy seems to have played less of a role in subsequent naval defence. The nineteenth century also saw the growth of parklands and big houses discretely away from the more strategic coastal locations. Ballybricken House was the mansion of the Connors, and Prospect House the villa of Lieutenant-Colonel Burke. Both lay to the west of the village that developed along the former shoreline of Barnahely and Loughbeg townlands, immediately adjacent to the RIngaskiddy East area. Though known today as Ringaskiddy, having absorbed the townland's name to the east, the nineteenth-century village was also known simply as 'Ring'. Fishing was important to the village's economy, particularly during the winter months, while Ringaskiddy also became a known summer resort.

6.3.2 Cartographic sources

The narrative of development revealed in the standing archaeological sites and features is indicated in the sequence of maps and charts that survive. The Down Survey of 1670 facilitated an assessment of land-holding across Ireland for Cromwellian interests by mapping the available lands in some detail. It accompanied a written record of such, known as the Civil Survey. A general map of the province included Cork Harbour, and the shoreline at Ringaskiddy is clearly indicated along with Haulbowline and Spike Islands, as the cartographer traces the passage of shipping to and from Cork (Figure 6.4). The barony map of Kerrycurrihy shows the coastline in greater detail but as its focus of attention was to plot the parishes within the barony it was less concerned with the accuracy of topographical detail (Figure 6.4). One begins to see the detail at parish level (Figure 6.4). Barnahely Parish, complete with its church and castle was valued at £235, and it included the townlands of Ballebricane (Ballybricken) on the shoreline to the west, and Reniskydy (Ringaskiddy) to the east. There was a small holding of the Earle of Corke on the shoreline between both townlands, while what became known in the nineteenth century as Ring Island was named Creagh on the Down Survey. The shoreline and sea area is clearly recorded but there is nothing to distinguish water depths or shoreline features, as these were not subjects that concerned the Down Surveyors.

Given the importance of the wider Harbour it is little surprise that other useful maps are known from an early period. A map of the Harbour dated *c*. 1770 shows Ringaskiddy in some greater detail from a maritime perspective, lying to the south of Great Island and in association with Haulbowline and Spike islands, while indicating the natural channels of navigation (Figure 6.5). The highlights on the landscape reveal the headlands and the forts. The map is clearly focusing on maritime access to the town, and the strategic role of Haulbowline and Spike Island is conveyed, as sentinel posts either side of the narrow passage around the point at Ringaskiddy. It is clear too that certain settlement exists on Ring Island, while what becomes Ballybricken House to the west has three buildings recorded, when it was known as Ballybrillon. A map of 1781 presents a still more strategic record (Figure 6.5). It accompanies a report of Lieutenant-Colonel Charles Vallancy on the defences of the Harbour, and was commissioned at the time of the American War of Independence, when Cork remained a key naval base to support England's efforts. The 'Survey of the harbour of Cork from the entrance to Haulboling Yards showing the range of the batteries…' highlights the integral place that Ring Point had. Recorded as 'Innishiddy Pt.' the map shows the low headland connected to the shoreline by a narrow sandy/stony bar. There is no fort on the headland but there is a small dark feature that perhaps represented a structure of some sort. A further map of 1800/1802 was completed following the French-supported United Irishmen rebellion of 1798 and indicates the strategic approaches to Cork (Figure 6.5). The channel for passage around the southwest side of Great Island is indicated running between Spike Island and Haulbowline Island. Ringaskiddy is clearly shown and labelled but there is little to indicate its fortified nature, and more to suggest its residential emphasis.

In the mid-1800s, the Ordnance Survey provides the first large-scale metrically accurate mapping, and this reveals the low-lying nature of the shoreline that is dominated by sandy shallows. Apart from the Martello tower and its associated features, the remains at Ringaskiddy are entirely residential and parklands, with a simple fishing village recorded at Ring, just south of the present-day East Basin (Ringaskiddy East) (Figure 6.6). A landing place is indicated at the foot of Ballybricken House, with a linear feature extending across the sandflats. Boathouses are shown on the shoreline close to where the demesne of Ballybricken House met the edge of Prospect Villa. There is little other structural evidence along the shoreline, while Ring Island and Ring Point show only a series of small field walls. An Ordnance Survey datum station is indicated at the tip of Ring Point. The structures that may have existed on Ring Island earlier are not shown.

Later editions of the Ordnance Survey maps show the progressive development of the shoreline. By the time of the Third Edition (*c*. 1912), the landing place at Ballybricken had been extended below the Low Water Mark and is recorded as 'Ballybricken Hard' (Figure 6.3). It reached almost across to what is today the reclaimed land of Ringaskiddy East. The boathouses belonging to Ballybricken House continued to exist, while a new linear breakwater, 'Foot's Hard', was built across the intertidal shallows on the east side of Ring Island. Buildings are once again recorded on the island, and include a windmill. There was also a well. The locations of these features are all now beneath the reclaimed land that forms Ringaskiddy East.

Much of the landscape along the shore of Ring/Ringaskiddy has been transformed since the mid-twentieth century. The building of industrial complexes took place across the parkland of Ballytaggart in the 1960s with the development of the Pfizer pharmaceutical plant. The development of the deepwater port at Ringaskiddy has seen the progressive reclamation of the foreshore along Barnahely and Loughbeg, and the former narrow extents of Ring Island and Ring Point are absorbed under the much more extensive Ringaskiddy East area, as indicated on Figure 6.3.

The footprint of the modern port shows the need to undertake extensive reclamation to reach the deep waters of the main channel. This is evident in Ringaskiddy West where the former shoreline of Ballybricken has been buried. The reclamation work has been far greater in Ringaskiddy East, where the large area of lowlying land that included Ring Island and Ring Point, and the sandy shallows that connected these locations with the shoreline, are beneath the current port surface. There is none of the original natural shoreline exposed within the current port area.

6.3.3 Architectural evidence

The Martello tower and Barracks (NIAH 20908747) are recorded as features of architectural heritage interest, and are also recorded as a complex of archaeological features (CO087-059001-3) (Appendix 6.1 in EIS Volume III a). The site area lies 1.1km away from the current development and will be not impacted by it.

A section of estate boundary wall runs along the western side of the R613 roadway, where it is intended to tie-in the improved road network of the Port to that outside. The wall defines the eastern boundary of Prospect Villa (NIAH CO-87-W-774641). A modern factory has been built on the site of the villa.

There is no entry made for Ringaskiddy in the OPW Ports and Harbours record files, 1708-1922, indicating that no state-financed harbour work took place there between those dates.

6.3.4 Historic Shipwreck Inventory

Neither the Ordnance Survey maps nor the Admiralty Charts indicate the presence of shipwrecks at Ring/Ringaskiddy. The Historic Shipwreck Inventory maintained by the National Monuments Section of DAHG, contains information on 150 shipwrecking events within Cork Harbour. The Inventory is a robust source for wrecking since the mid-1700s when records were made consistently. There are no references to wreckage at Ringaskiddy. When the Inventory is examined in detail with reference to recorded places of loss, there are only four possible instances of wreckage that occur close to Ringaskiddy (Appendix 6.1 in EIS Volume III a). The nearest locations are to the north at Cobh, or to the northeast at Haulbowline Island where, for instance, an unnamed wooden rowing boat collided with the steamship *Cambridge* on 20th October 1898 'off Haulbowline', and was lost with five of the 16 workmen aboard being drowned. The *Maria* was lost in 1900 at Rocky Island, which lies to the east of the main development, but is close to Paddy's Point. The existing record does not reveal further insight to what type of vessel the *Maria* was, or where she wrecked on the island. The absence of reported wrecking events at or immediately adjacent to Ringaskiddy may suggest the low potential for new discovery, but it is necessary to observe that the Inventory of Shipwrecks does not claim to be representative of wrecking events that occurred before *c*. 1750.

6.3.5 Licensed Archaeological Work

Certain archaeological work has been carried out (Appendix 6.1 in EIS Volume III a). In general, however, despite the number of different opportunities to monitor and investigate the soils on land and

at sea in the area around the port, little significant new insight has emerged. This may be due in part to the limited and discrete nature of most of the investigations. The discovery of the possible Bronze Age or Iron Age settlement enclosures made during work associated with the N28 road scheme in Barnahely townland is the notable exception, and the fact that this work necessitated the investigation of a relatively large area may be a factor in the discovery. It may therefore be anticipated that new works that are carried out over large areas, increase the archaeological risk of new discovery in what is a landscape and seascape of known and significant cultural heritage activity.

While archaeological work has occurred within the Ringaskiddy area, it has so far been non-intrusive survey and assessment. That work has resolved that there is no obvious material of archaeological significance exposed to view within the areas assessed, and recommends procedures of active archaeological monitoring during construction activities that may excavate and/or dredge into the underlying deposits. The marine geophysical survey and subsequent diver inspection that occurred in 2005-6 within the port area is reported on in section 6.4, and the work conducted in 2012 and 2014 is presented in section 6.5.

6.4 Primary Data Acquisition, 2005-6

6.4.1 Marine Geophysical Survey

The marine geophysical survey was conducted by Hydrographic Surveys Ltd, a leading marine survey company in Ireland with a detailed knowledge of the project area.. In addition to ongoing bathymetric survey to monitor seabed levels, new survey was carried out. Seismic survey would principally inform geotechnical aspects, while cultural heritage issues were more directly addressed by undertaking side-scan sonar survey and magnetometer survey. The work was focused on two areas; an area at Oyster Bank and the Ramp that includes the current redevelopment proposals within Ringaskiddy East, and a large area that extended either side of the ADM Jetty, and included the area of the current development footprint in Ringaskiddy West (Figure 6.7). The work identified a series of anomalies on the seabed, and these were subsequently inspected by diving to assess further their archaeological potential (the work conducted under licence 06D026). None of the anomalies proved to be archaeological in nature, and referred to former mooring features or debris.

The survey grid at Oyster Bank was conducted at 50m intervals, which ensured 100% coverage of the seabed area, and it extended beyond the area of the seabed where works are proposed for the current submission. The survey lines ran parallel with each other and were aligned East-West. The survey at the ADM Jetty was conducted at 50m intervals on the east or basin side, which ensured 100% coverage of the seabed area where it is proposed to conduct capital dredging as part of the present submission. The survey lines ran parallel to each other on a Northwest-Southeast alignment, and a single long line ran at right angles through the centre of this grid. The seabed on the north side of the jetty is much shallower and presents constraints to such survey but nevertheless followed a similar pattern in the deeper water.

A C-Boom sub-bottom profiler was used to ascertain the nature of the seabed layers. The survey concluded that the seabed at Oyster Bank and the ADM Jetty is characterised by sand, silt, shells, gravel, and clay, with peat also being noted at Oyster Bank, and that the thickness of subsurface material can range from 0m to 11.9m. The sub-bottom profiles at the Ramp reveal a coarse seabed littered with boulders lying on and extending through the sediment.

A CMax 800 dual frequency side-scan sonar device was used with range settings of 50m and 100m per channel. No indication of significant debris was observed but a series of small-scale anomalies were identified, and these locations were subsequently inspected by archaeological divers to clarify their nature and extent, as described in section 6.4.2.

An AX2000 Proton magnetometer was used. No indication of significant debris was observed but a series of small-scale anomalies were identified, and these locations were subsequently inspected by archaeological divers to clarify their nature and extent, as described in section 6.4.2.

6.4.2 Archaeological Inspection of Marine Geophysical Survey Anomalies

The marine geophysical survey identified 22 anomalies at Oyster Bank and 11 anomalies at the ADM Jetty site. The anomalies inspected underwater by archaeological divers sought to clarify their nature and extent. The diver would locate on site underwater and conduct a search pattern around the anomaly location, extending up to 30m from it, to ensure that the target area was fully identified and inspected. Record was made of the topographical context of the anomaly as well as of the feature itself, and an underwater metal-detector was employed to further assist in the survey work.

The seabed at Oyster Bank is dominated by a fine silt-sand mix that is up to 1m in thickness and lies over a silt-clay substrate. Occasional concentrations of rock and gravel were evident. The seabed at the ADM site is dominated by a similar fine silt-sand mix, which lies 40cm thick over a harder silt-clay mix. Linear undulations running parallel with the shore may result from vessel prop-wash, while certain dredge scars were visible resulting from maintenance dredging of the basin.

Of the 33 anomalies identified in the marine geophysical survey data, 31 were positively identified underwater, and the remaining two targets were thought to have represented mobile objects that had been moved by the tides. The observations are described in Appendix 6.2 (see EIS Volume III a). No material of archaeological significance was observed.

6.4.3 Intertidal Survey

The Oyster Bank area was also inspected and metal-detected at Low Water as an intertidal exercise.. The work confirmed the presence of a rock-armoured shoreline associated with the present quay area, and soft featureless sediment along its base. While large numbers of metallic debris were identified littering the shoreline, they were noted to be modern in date, and no features of archaeological interest were observed.

6.5 Primary Data Acquisition, 2012, 2014

On-site work in 2012 combined intertidal inspection and sub-tidal dive inspection to focus on three areas that had not been considered in detail previously, relative to the development proposals of the present submission (Figure 6.8). The work was completed under licence from the DAHG (12D016, 12R073). The intertidal survey was conducted during Low Water, and throughout the surveys the weather was clear, the sea state calm, and underwater visibility was good at 2m. The underwater work was completed using Surface-Supplied Diving Apparatus. Further underwater assessment was carried out in 2014 of the proposed new Public pier and slipway at Paddy's Point, upstream of the bridge to Haulbowline Island.

6.5.1 Land Assessment

Field-walking was undertaken in the Ringaskiddy East area in the locations on land within the development footprint. The reclaimed nature of the land area is clear (Figure 6.10). There is no indication of the former island that underlies this large area of fill, or of related features recorded on the First Edition Ordnance Survey and earlier maps. No material of archaeological significance was observed.

The tie-in point between the Port's proposed internal road upgrades, and the external road link to the N28 was inspected. Section of an estate wall (measuring *c*. 40m in length) survives where the road network tie-in runs along the R613. The wall is associated with the site of Prospect Villa (CO-87-W-774641). The wall is substantial in construction, measuring over 4m in height, and comprises a mixture of dressed-, semi-dressed, and rough-cut sandstone. An approximately 10m-long section has been removed from its northern end, as part of the development for the existing road network. Frequent repairs, both modern and old, are visible along the surviving extent of estate wall. The originally capping is obscured by heavy ivy growth.

6.5.2 Intertidal Assessment

Intertidal work was completed in the Ringaskiddy West area, extending west along the shoreline at Ballintaggart, and east in the space for reclamation beside the ADM Jetty (Figure 6.8). This landscape bears witness to the significant level of modern development; the shoreline is covered in rock armour except to the west along Ballintaggart, outside the Port of Cork property. In this location, which extends into Monkstown Creek, a wooded landscape extends to the High Water Mark, and a gently sloping shingle shore over sand extends seawards (Figure 6.11).

Within the Port of Cork area, soft sand and silt extends from the toe of the rock armour. A few patches of hard shingle are deposited close inshore on the north side of the ADM Jetty, but elsewhere the surface is featureless sand. The breakwater to the north is newly made and surfaced with rock armour.

Metal-detection noted a series of small anomalies that were revealed as modern debris. No material of archaeological significance was observed.

6.5.3 Underwater Assessment

Underwater inspection was completed at four locations (Figures 6.8, 6.14). A *c*. 500m long area extending up to 50m wide was inspected along the shore of Ringaskiddy East; this includes the Ramp area that was subject to seismic survey in 2005. The seabed area within the No. 2 dolphin ramps was also dived, on the south side of the port, where it is proposed to improve the road network within the port. The third area that was dived is where the Deepwater Berth in Ringaskiddy West is to be extended towards the ADM Jetty. In all three areas, the dives commenced in shallow water (-0.4m CD depth) (Figure 6.9). At both Ringaskiddy East and Ringaskiddy West the dive progressed downslope to the current dredge depths of -11m/-12m CD; at the No.2 dolphin ramps, dive depth reached -7m CD. The fourth area dived was at Paddy's Point, where it is proposed to construct a new Public Slipway and amenity area. The assessment undertaken at this location encompassed both the intertidal and sub-tidal environments (Figure 6.14).

The archaeological diver was towed in a systematic manner to and fro across each area to ensure that the same area of seabed was inspected from different angles. He was equipped with an underwater camera and a metal detector to assist in the recording of observations.

The dive area along Ringaskiddy East extended within the perch buoys that define the edge of the dredged channel. The shore is defined by rock armour (Figure 6.12). The seabed is composed of clean sand that slopes gently from a depth of *c*. 2m at the toe of the rock armour to some 10-11m at the edge of the dredged channel, where the seabed then slopes significantly into the dredged area. Apart from numerous observations of crabs, there were only two objects of debris noted; a modern coffee cup, and a tyre. No material of archaeological significance was observed.

The dive area within the No. 2 ramp dolphins represents a quiet area of the modern port close inshore. Rock armour lines the shoreline, while the dolphin ramps are made from large concrete piles. The seabed is rocky inshore (Figure 6.13). Such rock is not associated with the rock armour but extends outwards from the shoreline and is considered to represent the natural shore. Kelp and seaweed fronds represent a light vegetation cover. The rocky sub-tidal shore quickly gives way to sand, which occupies the remaining area out to the dolphin ramps. The sand lies quite high in the seabed but slopes significantly at the piles, where large hollows are a feature around the piles, representing scour pockets. No material of archaeological significance was observed.

The third dive area occurred in a narrow stretch from the north end of the DWB to the ADM Jetty (Figure 6.13). At Low Water Springs much of this area appears to dry out, but on the day of inspection it was sub-tidal. Rock armour lines the shoreline with a series of very large boulders forming the rock armour toe. Sand extends from the toe seaward, where it slopes gently until a point that is in line with the outer extent of the deepwater quay to the south. At this point, the seabed shelves steeply. No material of archaeological significance was observed.

The fourth dive area, located at Paddy's Point, extended across the intertidal foreshore for a distance of 40m (at Low Water) and 50m of sub-tidal seabed (Figure 6.14). To the east of the survey area, the

upper foreshore comprises of sections of exposed, shelving, bedrock. To the west, the upper foreshore comprises of rock amour, placed as part of modern reclamation works. The intertidal foreshore comprises silty-clay with frequent mussels (live) and crushed-shell inclusions. A linear feature, comprising a series of car tyres that run northeast-southwest along the foreshore and immediately to the west of the proposed public slipway, form a crab-trap that appears to be operated by the local angling club (a trap that has been maintained since the 1906s, according to local information). The sub-tidal zone is composed of a flat-featureless deposit of silty-clay with a penetration depth of over 1m. No material of archaeological significance was observed. The proposed alignment of the new slipway has since been shifted slightly, and includes a small area of seabed that was not inspected. Subject to the granting of permission for the scheme, this area of seabed will be inspected prior to construction.

The intertidal and dive work did not observe any of the features relating to the former seashore recorded on the nineteenth century Ordnance Survey First Edition maps. The work observed a seabed characterised by sand and silt which would provide a good holding content for buried material if it exists. No features or objects of archaeological significance were observed lying on the seabed surface or protruding from it. It remains possible that archaeological material lies buried in the covering sediments.

6.5.4 Conclusion, existing environment

It is possible to conclude that the cultural heritage assessment completed has been extensive and comprehensive, employing a wide range of resources and non-intrusive survey to make a coherent assessment of the cultural heritage risk associated with the present project. The boundary wall of Prospect Villa is standing. There are otherwise no upstanding remains of archaeological or architectural significance within the proposed development area. The locations remain areas of cultural heritage potential but there is no cultural heritage reason why the development should not proceed. The development will include direct impacts on the land surfaces and seabed areas, and archaeological monitoring is recommended as the most effective mitigation strategy to resolve further cultural heritage issues that may arise during construction and dredging works.

6.6 Impact Assessment

6.6.1 Impacts during Construction Phase

The three principal elements of the proposed works include construction in Ringaskiddy East, Ringaskiddy West, and improvements to the road entrance to the Terminal. In all cases, the greatest impact will arise from dredging works. The fact that the landward sides of the development areas are on land reclaimed in the twentieth century suggests it is unlikely that new work will encounter levels of archaeological interest, unless it is intended to excavate to below the depth of reclamation. Any works that extend to below the depth of reclamation would represent excavation into unrecorded levels and would require an archaeological resolution.

Limited reclamation is proposed in Ringaskiddy East for a *c*. 1.2 ha area, to provide a working quay area to facilitate a 314m long CB/MPB quay wall and deck, and a 200m long container berth. This will extend the existing outline and tip of the quay along its northwest side. Any works that require excavation of the seabed deposits will require an archaeological resolution.

Dredging is proposed in Ringaskiddy East and will extend from the current level of c. -1.5m CD at the shoreline to a level of -13m CD, which is 1.25m below the general basin level of 11.75m. It represents the removal of seabed deposits right along the full western extent of the quay. It is a significant direct permanent impact on the seabed and will require an archaeological resolution.

Reclamation is proposed in Ringaskiddy West to provide a new 182m long extension to the existing DWB, where a filled quay will extend seaward to be in line with the edge of the existing berth. The affected area measures approximately 0.8 ha in size.

Dredging is proposed in Ringaskiddy West. The dredging will extend the width of the 182m-long extension of the existing DWB, and will reach seawards along the length of the ADM Jetty. Dredging will extend from the current level of *c*. -0.4m CD at the shoreline to a level of -13.4m CD at the new

berth, and to -11.75m CD on the approach to the berths, to facilitate navigational access to the new facilities. The dredging will be a significant direct permanent impact on the seabed and will require an archaeological resolution.

Reclamation works are proposed for the new public slipway at Paddy's Point Amenity Area, as described in Chapter 3.

Reclamation is proposed for the internal link road between Ringaskiddy East and Ringaskiddy West to provide a safe and appropriately scaled access junction to the existing N28. The work will include construction of an embankment on land reclaimed between the No. 2 ramp dolphins and the existing quayside. Any works that require excavation of the seabed deposits will require an archaeological resolution.

The works also include tie-in to the existing N28 road network outside the port, alongside the boundary wall of the former site of Prospect Villa, which defines the west side of the R613. The boundary wall will be directly impacted in part. The area of impact will be recorded archaeologically in advance of its destruction, which will be monitored archaeologically.

The fill material used for reclamation will be imported from local land sources.

6.6.2 Impacts during Operation and Aftercare

No potential impacts are identified at this moment during the operational phase as it is anticipated that the archaeological environment will have been resolved during the construction phase.

6.7 Mitigating Measures

6.7.1 Pre-construction Measures

The proposed alignment of the new slipway at Paddy's Point Amenity Area has been shifted slightly since the seabed was inspected in 2014, and includes a small area of seabed that was not inspected. Subject to the granting of permission for the scheme, this area of seabed will be inspected prior to construction.

No further archaeological mitigation is identified prior to development works proceeding.

6.7.2 Construction Phase Measures

Archaeological recording: The area of impact on the Prospect Villa boundary wall will be recorded archaeologically in advance of its destruction, which will be monitored archaeologically.

Archaeological monitoring: It is recommended that archaeological monitoring by a suitably qualified and experienced maritime archaeologist licensed by the DAHG is conducted during all seabed, inter-tidal/foreshore and terrestrial disturbances associated with the development. Licence applications take a minimum of three weeks to process through the Department, and advance planning is required to ensure that the necessary permits are in place before site works commence.

The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed in the course of the works that require consideration.

The monitoring will include a finds retrieval strategy that is in compliance with the requirements of the National Museum of Ireland.

Retaining and archaeologist/s: An archaeologist experienced in maritime archaeology will be retained for the duration of the relevant works.

The time scale for the construction phase will be made available to the archaeologist, with information on where and when ground disturbances will take place.

Discovery of archaeological material: In the event of archaeologically significant features or material being uncovered during the construction phase, machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material. The DAHG and the NMI will be notified of such discovery, in accordance with archaeological license requirements.

Archaeological material: Once the presence of archaeologically significant material is established, full archaeological recording of such material will be recommended. If it is not possible for the construction works to avoid the material, full excavation will be recommended. The extent and duration of excavation will be a matter for discussion between the Port of Cork and the licensing authorities.

Archaeological team: The core of a suitable archaeological team will be on standby to deal with any such rescue excavation. This would be complimented in the event of a full excavation.

Archaeological dive team: An archaeological dive team will be retained on standby for the duration of any in-water disturbance works on the basis of a twenty-four or forty-eight hour call-out response schedule, to deal with any archaeologically significant/potential material that is identified in the course of the ground disturbance activities. The permits necessary for this aspect of the site work is additional to the excavation licence required by the archaeological monitor, and are generally held by the dive-team leader. The archaeological dive licence takes a minimum of three weeks to process. It is necessary to ensure that all permits are in place before site works commence.

A site office and facilities will be provided by the Port of Cork on site for use by archaeologists.

Secure wet storage facilities will be provided on site by the Port of Cork to facilitate the temporary storage of artefacts that may be recorded during the course of the site work.

Buoying/fencing of any such areas of discovery will be carried out if discovered and during excavation.

Machinery traffic during construction will be restricted to avoid any identified archaeological site/s and their environs.

Spoil will not be dumped on any of the selected sites or their environs.

Please note: The above recommendations are subject to the approval of the National Monuments Section at the DAHG.

6.8 Cumulative Effects

A range of projects, comprising the Spike Island Masterplan, Monkstown Marina, and the East Tip Remediation Project on Haulbowline Island, has been taken into consideration as part of the cumulative assessment. When these projects have been considered as part of this assessment from a cultural heritage perspective, no significant cumulative effects are predicted.

6.9 Residual Impacts

6.9.1 Operational Phase

It is not anticipated that any archaeological measures should be necessary during the operational phase as it is understood that any archaeology encountered will be resolved in the construction stage of the proposed redevelopment.

6.9.2 Residual Impacts

It is not anticipated that here will be any residual impacts on archaeological features or sites encountered as it is understood that any archaeology encountered will be resolved in the construction stage of the proposed redevelopment.

7.0 LANDSCAPE AND VISUAL

7.1 Introduction

This Chapter examines the potential landscape and visual impact on the Ringaskiddy area and the wider Cork Harbour area of the proposed port redevelopment at Ringaskiddy, Co. Cork during construction and operational stages. For all figures referred to in this Chapter please see EIS Volume II – Figures. The existing Ringaskiddy Port is a recognised feature of the landscape and visual context of Cork Harbour. The existing tall cranes, lighting, vehicular and ship traffic coming and going from Ringaskiddy are currently and will remain features in the area of the proposal.

The overall approach is summarised as follows:

a) Establish the baseline conditions -

Record and analyse the existing character, quality and sensitivity of the landscape and visual resource. This should include elements of the landscape such as;

- Landform;
- Land cover including the vegetation, the slopes, drainage, etc;
- Landscape character;
- Current landscape designations and planning policies; and
- Site visibility, comprising short, medium and long distance views.

b) Analyse baseline conditions -

Comment on the scale, character, condition and the importance of the baseline landscape, its sensitivity to change and the enhancement potential where possible.

A visual analysis (illustrated by photographic material) describing characteristics which may be of relevance to the impact of the design and to the method of mitigation.

c) Describe the proposal

d) Identify the Impacts of the proposal on the Landscape and Visual Resource -

Identify the landscape and visual impacts of the development at different stages of its life cycle, including:

- Direct & indirect *landscape impacts* of the development on the landscape of the site and the surrounding area; and
- *Visual impacts* including: the extent of potential visibility; the view and viewers affected; the degree of visual intrusion; the distance of views; and resultant impacts upon the character and quality of views.

e) Assess the significance of the landscape and visual impacts in terms of the sensitivity of the landscape and visual resource, including the nature and magnitude of the impact.

f) Detail measures proposed to mitigate significant adverse landscape and visual impacts and assess their effectiveness.

g) Assess the ability of the landscape and visual resource to absorb the proposal with any mitigation proposed.

7.2 Methodology

7.2.1 Introduction

Methods used in this assessment have been developed by RPS and are derived from the DoEHLG "Landscape and Landscape Assessment" (June 2000) and 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA) by The Landscape Institute and Institute of Environmental Management and Assessment (2013). These documents recommend baseline studies to describe, classify and evaluate the existing landscape and visual resource focusing on its sensitivity and ability to accommodate change. The guidelines are not intended as a prescriptive set of rules but rather offer best practice methods and techniques of LVIA. The existing landscape and visual context of the study area was established through a process of desktop study, site survey work and photographic surveys. The proposal was then applied to the baseline conditions to allow the identification of potential impacts, prediction of their magnitude and assessment of their significance. Mitigation is identified to reduce as far as possible any potential adverse landscape and visual impacts.

7.2.2 Landscape Assessment Criteria and Terminology

The following section describes the criteria and terminology used for during the landscape assessment: -

Landscape Quality

For the purpose of this assessment, landscape quality is categorised as:

- *Exceptional Quality* - Areas of especially high quality acknowledged through designation as Areas of Outstanding Natural Beauty or other landscape based sensitive areas. A landscape that is significant within the wider region or at a national level;

- *High Quality* - Areas that have a very strong positive character with valued and consistent distinctive features that gives the landscape unity, richness and harmony. A landscape that is significant within the district;

- *Medium Quality* - Areas that exhibit positive character but which may have evidence of alteration/degradation or erosion of features resulting in a less distinctive landscape. May be of some local landscape significance with some positive recognisable structure; and

- *Low Quality* - Areas that are generally negative in character, degraded and in poor condition. No distinctive positive characteristics and with little or no structure. Scope for positive enhancement.

Landscape Sensitivity

Landscape sensitivity to the type of development proposed is defined as follows:

- *High Sensitivity*: High visual quality landscape with highly valued or unique characteristics susceptible to relatively small changes.

- *Medium Sensitivity*: Medium visual quality landscape with moderately valued characteristics reasonably tolerant of changes.

- *Low Sensitivity*: Low visual quality landscape with common characteristics capable of absorbing substantial change.

Magnitude of Landscape Resource Change

Direct resource changes on the landscape character of the study area are brought about by the introduction of the proposal and its effects on the key landscape characteristics. The following categories and criteria have been used:

- *High magnitude*: Total loss or alteration to key elements of the landscape character which result in fundamental and / or permanent long-term change.

- *Medium magnitude*: Partial or noticeable loss of elements of the landscape character and / or medium-term change.

- *Low magnitude*: Minor alteration to elements of the landscape character and / or short-term/ temporary change.
- *No Change:* No change to landscape character.

Significance of Landscape Impact

The level of significance of effect on landscape is a product of landscape sensitivity and the magnitude of alteration in landscape resource. Where landscape sensitivity has been predicted as high and the magnitude of change as high or medium the resultant impact will be significant in terms of EIA Regulations. This is illustrated in Table 7.1 below.

Table 7.1 Significance of Landscape Impact

Magnitude of Landscape resource change	Landscape Sensitivity		
	Low	Medium	High
No change	No change	No change	No change
Low	Slight	Slight / moderate	Moderate
Medium	Slight / moderate	Moderate	Moderate / Substantial
High	Moderate	Moderate / Substantial	Substantial

Landscape Assessment Definitions

- *Landscape Resource*: The combination of elements that contribute to landscape context, character and value.

- *Landscape Value:* The relative value or importance attached to a landscape that expresses national or local consensus because of intrinsic characteristics.

- *Landscape Character*: The distinct and homogenous pattern that occurs in the landscape reflecting geology, landform, soils, vegetation and man's impact.

7.2.3 Visual Assessment Criteria and Terminology

The following text describes the key criteria and terminology used in the visual assessment.

Viewer Sensitivity
Viewer sensitivity is a combination of the sensitivity of the human receptor (i.e. resident; commuter, tourist; walker; recreationist, or worker) and viewpoint type or location (i.e. house, workplace, leisure venue, local beauty spot, scenic viewpoint, commuter route, tourist route or walkers' route). Sensitivity can be defined as follows:

- *High sensitivity:* e.g. users of an outdoor recreation feature which focuses on the landscape; valued views enjoyed by the community; tourist visitors to scenic viewpoint.

- *Medium sensitivity:* e.g. users of outdoor sport or recreation which does not offer or focus attention on landscape; tourist travellers.

- *Low sensitivity:* e.g. regular commuters, people at place of work (excluding outdoor recreation).

Magnitude of Visual Resource Change

The magnitude of alteration in visual resource or amenity results from the scale of change in the view with respect to the loss or addition of features in the view and changes in the view composition, including proportion of the view occupied by the proposal. Distance and duration of view must be considered. Other vertical features in the landscape and the backdrop to the development will all influence the magnitude of visual resource change. This can be defined as follows:

- *High magnitude:* Where changes to the view significantly alter (adverse or beneficial) the overall scene or cause some alteration to the view for a significant length of time.

- *Medium magnitude:* Where some changes occur (adverse or beneficial) in the view, but not for a substantial part of the view and/or for a substantial length of time.

- *Low magnitude*: Where only a minor alteration to the view occurs (adverse or beneficial) and/or not for a significant length of time.

- *No change:* No discernible deterioration or improvement in the existing view.

Significance of Visual Impact

Significance of visual impact is defined on a project by project basis. The principal criteria for determining significance are magnitude and sensitivity of the receptor. A higher level of significance is generally attached to large scale or substantial effects on sensitive receptors.

Where visual sensitivity has been predicted as high or medium, and the magnitude of change as high, the resultant impact will be significant. Where the magnitude of change has been predicted as high and the visual sensitivity has been predicted as high or medium then the resultant impact will be significant in terms of EIA Regulations.

Table 7.2 illustrates significance of visual impact as a correlation between viewer sensitivity and visual resource change magnitude.

Table 7.2 Significance of Visual Impact

Visual resource change magnitude	Visual Sensitivity		
	Low	Medium	High
No change	No change	No change	No change
Low	Slight	Slight / moderate	Moderate
Medium	Slight / moderate	Moderate	Moderate / Substantial
High	Moderate	Moderate/ Substantial	Substantial

Positive effects upon receptors may also result from a change to the view. These may be through the removal of negative features or visual detractors, or through the addition of well designed elements, which add to the visual experience in a complementary, positive and stimulating manner.

Visual Assessment Definitions

Visual Quality: Although the interpretation of viewers' experience can have preferential and subjective components, there is generally clear public agreement that the visual resources of certain landscapes have high visual quality. The visual quality of a landscape will reflect the physical state of the repair of individual features or elements.

Visual Resources: The visual resources of the landscape are the stimuli upon which actual visual experience is based. They are a combination of visual character and visual quality.

Visual Character: When a viewer experiences the visual environment, it is not observed as one aspect at a time, but rather as an integrated whole. The viewer's visual understanding of an area is based on the visual character of elements and aspects and the relationships between them.

Zone of Visual Influence (ZVI)
The ZVI is the area within which views of the site and/or the proposal can be obtained. The extent of the ZVI is determined primarily by the topography of the area. The ZVI is then refined by field studies to indicate where relevant forestry, woodlands, hedges or other local features obscure visibility from the main roads, local viewpoints/landmarks and/or significant settlements.

Using terrain-modelling techniques combined with the proposal specification, a map is created to show areas from where the proposed development would theoretically be seen. A worst case scenario is taken in line with Landscape Institute guidelines.

The actual visual impacts within the ZVI have been described in later sections of this Chapter.

Photographs & Photomontages
Photographs and photomontages have been prepared for selected representative viewpoints throughout the study area as indicated in Figure 7.3 and illustrated in section 7.5.5 below (see EIS Volume II – Figures).

Viewpoints are chosen to give a typical representative sample of views of the proposal within the landscape using the parameters of distance and direction of view. Viewpoints frequented by members of the public such as public rights of way, car parks and popular viewpoints are usually chosen, along with views from nearby settlements.

Photographs from each viewpoint location are taken covering an arc of view matching that of the visual extent of the proposal.

7.3 Receiving Environment

7.3.1 Scale and Character

The village of Ringaskiddy is located southeast of Cork City, and has a reputation as a hub of industry for County Cork and as a cargo and ferry port linking Ireland to the UK and France. The proposed redevelopment site comprises an area of land which has been reclaimed since circa the 1970's and a further small area of seabed which is proposed to be reclaimed. The northern boundary of the proposed site abuts the waters of Cork Harbour with Monkstown, Cobh and Whitepoint located further north, while the N28 and Ringaskiddy village is located to the south. To the east of the proposed redevelopment is located the National Maritime College and Haulbowline Island, while existing industrial lands are located to the west (see Site Location Figure 3.1 of the EIS Volume II - Figures).

Cobh is a significantly larger settlement than Ringaskiddy and has an important tourist industry and acts as a satellite town for Cork City. Large cruise liners regularly berth at Cobh from where tourists can explore Cobh and the wider Cork City area. The topography at Cobh rises steeply from the shoreline with stepped terraces of houses that broadly follow the contours with direct views across the Harbour.

Monkstown is located to the northwest of Ringaskiddy and like Cobh has grown up the steep hillsides that surround Cork Harbour with distinctive terraces and occasional church spire breaking the skyline. Due to the terraced nature of the settlement there are potential views across the Harbour.

Haulbowline Island is located to the east and the topography of the island site is generally flat in the centre with undulations to the western and eastern most edges before reaching sea level at the edge. The naval base buildings offer screening in views to the west but the east side of the island is open to views to the north east and south. The eastern side of the island is known as east tip and consists of the brownfield site of the former Irish Steel plant. Views of the island are available from Cobh to the north, Monkstown to the west and Ringaskiddy to the southwest.

In addition the Cork Harbour is well used for commercial and leisure craft that will also have views of the island.

The proposed redevelopment site comprises a portion of coastal lands located on the north-eastern periphery of an extended industrial area that consists of various chemical and pharmaceutical factories including Pfizer. There is an associated narrow jetty extending into the Harbour at Ballybricken Point to the northwest of the site known as the ADM Jetty. The existing port facilities and associated ship and vehicle traffic at Ringaskiddy are a prominent part of the existing landscape on this side of Cork City.

The topography of the site is flat reaching sea level at the harbour's edge. Further inland to the southwest, beyond the N28 and Ringaskiddy village, the landscape becomes increasingly rural. The topography also rises steadily to a crest over 50m OD, permitting medium distance views toward the site. The even and level nature of the proposed redevelopment site is contrasted by the steep, rising elevations of lands that surround the inner Cork Harbour at Ringaskiddy, Monkstown and Cobh.

Given the coastal location of this proposal it is anticipated that there will be potential views available from:

- Monkstown to the northwest;
- Cobh to the northeast (particularly Blackpoint and Whitepoint);
- Haulbowline to the east;
- Ringaskiddy and the adjacent coastline to the south.

The landscape character of the study area can be described by use of the following distinctive landscape character areas (which are illustrated in Figure 7.2):

Estuarine Harbour-Based Industrial and Maritime Landscape
This landscape character area is concentrated mainly on low-lying parts of the landscape at the edge of Cork Harbour, but also expands to the hillsides. Many of the industrial sites are located at the waters edge for operational purposes. Industrial sites are located at Ringaskiddy (mainly pharmaceutical plants), Haulbowline island with its naval activities, Rushbrooke (Cork Dockyard), Aghada and Whitegate (electricity generating station and oil refinery). The value of this landscape is mainly economic, due to its industrial nature. This is a generally robust changing landscape. The industrial landscapes around the existing Cork Harbour and reclaimed lands are generally of low visual quality with frequent industrial type buildings and equipment and vacant lands. The proposed site has a recreational value as it is used for by walkers, and for the launching of recreational boats at an existing slipway and pier. Recently the erection of wind turbines has altered the landscape character of the Cork Harbour at Ringaskiddy and the wind turbines are visible over a wide area and are the tallest features in the landscape. Overall this landscape character area has a low sensitivity to change.

Harbour Edge Town Centre and Undulating Residential Townscape
Town centres such as Ringaskiddy, Monkstown, Cobh and Passage West are all located at the waterside of Cork Harbour. The residential areas of these towns have spread outwards along the harbour. Monkstown, Cobh and Passage West have also extensively spread onto the surrounding hillsides, with Cobh continuing to expand on to the higher parts of the hill on which it is located. The towns have a scenic value due to their location on the harbour. This value is expressed by the designations of scenic landscapes and scenic routes. These towns also have recreational value in the form of town parks or walking trails. Cobh has a number of structures recorded for protection. These structures give Cobh a high scenic value. Due to Cobh's history it attracts many visitors and has a high recreational value. This landscape character area has a medium sensitivity to change.

Undulating Agricultural Patchwork Landscape
The undulating agricultural landscape is a landscape found over a wide area in County Cork and comprises agricultural fields, and meadows, hedgerows as field boundaries, rural houses, farm complexes etc. It also comprises protected structures scattered across the landscape. This landscape extends inland from the harbour's edge and is undulating in nature. This landscape character area is medium sensitivity to change.

7.3.2 Planning Designations

County Cork Development Plan 2009
A review took place of the current draft Development Plan and it was found that the landscape designations in the current Development Plan were consistent with the draft Development Plan. The Cork County Development Plan 2009 states the following objectives regarding scenic amenity views and prospects:

ENV 2-6 General Visual and Scenic Amenity: It is a general objective to protect the visual and scenic amenities of County Cork's built and natural environment

ENV 2-7 Scenic Landscape: It is a particular objective to preserve the visual and scenic amenities of those areas of natural beauty identified as 'scenic landscape'.

ENV 2-8 Landscape Conservation Area(s): It is an objective to carry out an appraisal study in order to identify any area(s) or place(s) within the County as a Landscape Conservation Area in accordance with the Planning and Development Acts.

ENV 2-9 General Views and Prospects: It is a general objective to preserve the character of all important views and prospects, particularly sea views, river or lake views, views of unspoilt mountains, upland or coastal landscapes, views of historical or cultural significance (including buildings and townscapes) and views of natural beauty as recognised in the Landscape Strategy.

ENV 2-10 Development on Approach Roads to Towns and Villages: It is an objective to ensure that the approach roads to towns and villages are protected from inappropriate development, which would detract from the setting and historic character of these settlements.

ENV 2-11 Scenic Routes: It is a particular objective to preserve the character of those views and prospects obtainable from scenic routes identified in this plan.

ENV 2-12 Details of Scenic Routes: It is an objective to protect the character and quality of those particular stretches of scenic routes that have very special views and prospects.

ENV 2-13 Development on Scenic Routes
(a) It is also an objective of the Planning Authority to require those seeking to carry out development in the environs of a scenic route and/or an area with important views and prospects, to demonstrate that there will be no adverse obstruction or degradation of the views towards and from vulnerable landscape features. In such areas, the appropriateness of the design, site layout, and landscaping of the proposed redevelopment must be demonstrated along with mitigation measures to prevent significant alterations to the appearance or character of the area. (b) It is an objective to encourage appropriate landscaping and screen planting of developments along scenic routes. Where scenic routes run through settlements street trees and ornamental landscaping may also be required.

Designated Scenic Routes and Landscapes
As the existing environment is characterised by estuary, shorelines, waterfront villages, undulating patchwork fields, etc. the County Cork Development Plan 2009 has designated a number of Scenic Landscapes and Scenic Routes in proximity to Ringaskiddy. These are indicated in Maps 9 and 10 in Volume 3 of the County Cork Development Plan 2009 and itemised in Table 7.3 below.

Table 7.3: Designated Scenic Landscapes and Scenic Routes in study area

Designation	Location
Scenic landscape	Monkstown.
Scenic Landscape	Great Island.
Scenic Route S51	R630 Regional Road & Local Road from Ballynacorra via East Ferry to Whitegate and Roche's Point. Views of the Estuary & Harbour, Roche's Point & the rural coastal environment.
Scenic Route S53	R624 Regional Road, between Cobh and Belvelly Views of the Upper Harbour and coastal environment.
Scenic Route S54	R610 Regional Road, Local Road & N28 National Primary Route between Passage West and Ringaskiddy. Views of the Harbour.

7.4 Project Description

Chapter 3 of the EIS provides a detailed description of the port operational activities associated with the Ringaskiddy Port Redevelopment and only a summary of the most relevant components of the proposal is provided in this Chapter. The proposed redevelopment consists of four distinct elements namely; Ringaskiddy East where a Container Berth / Multi-purpose Berth (CB/MPB) and Container Terminal will be provided; Deepwater Berth Extension (DWB) at Ringaskiddy West; Road Improvements; and Paddy's Point where a new amenity area will be created. The main components that have the greatest potential to affect the landscape and visual impact are the vessels at berth, the ship to shore cranes, the stacked containers and the container stacking equipment. The heights of the cranes and container stacking equipment used in the assessment are based on typical dimensions of equipment currently available in the marketplace; refer to Chapter 3 of the EIS – Project Description.

The movement of shipping vessels associated with the proposed port redevelopment will also be an added visual component and with potential visual impact. However, such ships are already currently traversing the harbour en route to the existing port at Tivoli and to the existing port facilities at Ringaskiddy on a frequent basis. Docked vessels are considered to be the main impact on the existing environment within the study area as moving vessels are of a temporary nature.

The proposed Ringaskiddy Port Redevelopment will result in the following physical elements likely to affect the landscape and visual characteristics of the receiving environment:

- Construction of access and site entrances
- Creation of new quay walls
- Ships at berth
- Traffic
- Erection of new tall built elements and container stacks

7.5 Landscape and Visual Impacts – Operational Phase

7.5.1 Landscape Character Area Impacts

The proposed Ringaskiddy Port Redevelopment is located directly within the Estuarine Harbour-based Industrial and Maritime Landscape.

Estuarine Harbour-Based Industrial and Maritime Landscape
This landscape character area is concentrated mainly on low-lying parts of the landscape at the edge of Cork Harbour including the islands. This is a generally robust frequently changing landscape. The current Ringaskiddy Port site is a prominent part of this landscape and associated with wider industrial landscapes to the west of Ringaskiddy including the Pfizer factory. The recently erected wind turbines are a new and very tall feature in the Cork Harbour.

The operational phase of the proposal will consist of new facilities constructed beside the existing port facilities. These new facilities will be of a type that is consistent with the current uses and features of

this landscape such as tall cranes and ships and traffic. The proposed container stacks will be a new feature but related to the current port industry. The proposed cranes will lower than the adjacent wind turbines and not be the tallest features in the harbour landscape. Overall such uses are consistent with the character of this landscape and while there will be a larger facility at the site this is a robust and constantly changing landscape. The existing slipway at Ringaskiddy will be removed but replaced by the proposed slipway at Paddy's Point.

The Estuarine Harbour-based Industrial and Maritime Landscape Character Area has a low sensitivity to change.

The predicted change in landscape resource is medium.

When landscape impacts are assessed during the operational phase there will be slight/moderate adverse.

Harbour Edge Town Centre and Undulating Residential Townscape

The proposal is not directly located within this landscape character and there are no direct impacts as result. The proposals will however provide a backdrop to Ringaskiddy, Monkstown and Cobh and there is therefore potential for indirect landscape impacts. The proposals are located at distance from Monkstown and Cobh and this fact when combined with the fact that the existing port facilities are part of the backdrop to both these settlements decreases potential for indirect change in landscape resource. With regards to the indirect landscape impact on Ringaskiddy the proposals are obviously located directly adjacent to the settlement but Ringaskiddy is known as a port village already and although there will be an extension to the existing facilities these are largely located beyond existing port site including the existing Ferry Terminal and DWB that offset potential for indirect landscape impacts.

This landscape character area has a medium sensitivity to change.

The predicted change in landscape resource is low.

When landscape impacts are assessed during the operational phase there will be slight/moderate adverse indirect impact.

Undulating Agricultural Patchwork Landscape

This landscape extends inland from the harbour's edge and is of an undulating nature. The proposal is not directly located within this landscape character and there are no direct impacts as result. The proposals are located at distance from this landscape character area a fact that limits the influence of the proposals on this extensive landscape. In most cases there are settlements or urban landscapes located between the proposals and this landscape.

This landscape character area has a medium sensitivity to change.

The predicted change in landscape resource is no change.

When landscape impacts are assessed during the operational phase there will be no change.

7.5.2 Planning Policy Designation Impacts

Cork County Development Plan 2009 – 2015

Impacts on relevant designations contained within the Cork County Development Plan are assessed below. A review also took place in the current draft County Cork Development Plan and it was established that there were no significant differences to the current plan.

Scenic Route S51: The R630 is located at its nearest approximately 6km east of the proposed redevelopment and at such distances it is currently impossible to discern detail at the existing site and

Haulbowline interrupts views further. Operational stage activities will not be noticeable. The predicted visual impact for the Scenic Route 51 is no change.

Scenic Route S53: The majority of this route is located on the west side of Great Island and therefore visually separated from proposed site. On approaching Cobh the road does offer glimpse and direct views across the harbour to the proposed site. The views are from low lying positions. The existing site is barely noticeable in these views and the proposals will be difficult to discern at this distance and with Haulbowline Island the main focal point in the foreground. The predicted significance of visual impact is no change.

Scenic Route S54: People driving the scenic route in the direction from Passage to Monkstown will be looking in the direction of the proposed redevelopment but only with glimpse views available. When leaving Passage West the receptor will experience a brief view towards the redevelopment but a distance of approximately 3km. Due to the distance between receptor and proposal the proposed port redevelopment will be read as part of the wider landscape that includes more prominent tall electricity pylons and cranes at Rushbrooke and the existing port facilities.

Drivers on the scenic route in the direction of Monkstown to Monkstown Creek and visa versa will have a view of the redevelopment. The proposed containers, docked vessels, and cranes will be visible due to the open view over the harbour towards the redevelopment. The proposals are read with the existing port facilities including the ADM Jetty and DWB that are more prominent in the foreground.

Parts of the proposal will be intermittently visible to people driving the scenic route from Shanbally to Ringaskiddy. This will comprise the ship to shore cranes. The views are read in the context of the urban development on this side of Ringaskiddy and the existing port facilities.

When entering Ringaskiddy the existing port facilities and vegetation significantly limit views to the proposals.

The predicted visual impact for the Scenic Route 54 is moderate adverse.

7.5.3 Zone of Visual Influence (ZVI)

The ZVI for the proposed redevelopment is illustrated in Figure 7.1. The ZVI has been used to identify the locations where potential visual impacts may occur. As viewer distance from the proposed site and existing harbour facility increases, the level of visibility decreases significantly. In reality, views of the site will be entirely obscured from a number of locations within this area such as from within the Ringaskiddy, Monkstown and Cobh urban areas and undulating shoreline.

The following text describes the actual predicted visual impacts on visual receptors within the ZVI.

7.5.4 Visual Impacts on Residential Properties

An assessment has occurred within the ZVI to determine the magnitude of visual impact of the proposed redevelopment during the operational phase on potential views from sensitive visual receptors including residential properties.

Ringaskiddy Residential Properties: As with all the settlements located around the Harbour there are large areas of Ringaskiddy that will not have views of the proposal due to intervening vegetation and buildings. However due to the terraced nature of the settlement there will be direct views from a number of properties on the northern side of the built form. While the existing port facilities including ships and cranes and traffic are features of these existing views, there will be new features visible particularly the cranes and containers when at maximum height. Overall the predicted significance of visual impact is predicted as substantial adverse for the residential properties at Ringaskiddy with a view.

Monkstown Residential Properties: There are significant areas of open water located between Monkstown and the proposed site. The existing port facilities at Ringaskiddy are also a feature of the views from properties as are the cranes and other port facilities at Rushbrooke. While the proposals will be located within the view from those dwelling overlooking the Harbour the distance from the proposals combined with the presence of existing port facilities and on-going activity of ships coming

and going from the port will offset potential visual impacts. Overall the predicted significance of visual impact is predicted as moderate adverse for the residential properties at Monkstown with a view.

Cobh Residential Properties: As with Monkstown there are significant areas of open water located between Cobh and the proposed site and the settlement is located at a greater distance from the proposals as well. The existing port facilities at Ringaskiddy are a minor feature of the views from properties due to the distance and angle of view that are directed south predominantly towards Haulbowline Island. The distance of the proposals from Cobh combined with the presence of existing port facilities and ships will significantly offset potential visual impacts. Overall the predicted significance of visual impact is predicted as slight/moderate adverse for the residential properties at Cobh with a view.

Blackpoint and Whitepoint Properties: The majority of properties at Blackpoint and Whitepoint will not have a view of the proposals as they are interrupted by adjacent buildings and extensive tree cover that is found in this area. It is predominantly only from a limited number of properties that front onto the shore that will have potential views. The taller components of the proposal such as the containers, cranes, and docked vessels will be the most noticeable features. The proposals are read against the background of the existing port facilities with existing tall cranes and mast lighting. Ships coming and going from the Ringaskiddy Harbour are a feature of views from those properties that overlook the Harbour. The proposals will occupy a small portion of the panoramic view up and down the Harbour. Overall the predicted significance of visual impact is predicted as substantial adverse for the limited number of residential properties at Blackpoint and Whitepoint with a view.

Harbour Users: The Harbour is well used by commercial and leisure craft for example visitors to Spike Island travel in boats from Cobh currently. There are many leisure craft moored at both Monkstown and Cobh and there is a small slipway at Ringaskiddy. All such vessels will have potential for views of the proposed operational site. The existing port facilities are a feature of all views in proximity to the site as are visiting ships that travel to Ringaskiddy, Tivoli and City Quays. Views from all leisure craft will be from a low level in the water looking up and over emphasising the scale of the proposals at close range. The predicted significance of visual impact will be substantial in close proximity but decreasing to no change and slight with distance away from the proposed site.

7.5.5 Viewpoint Assessment

A series of representative viewpoints have been selected from locations throughout the study area and photomontages prepared of the proposals and subjected to specific assessment below. The location of all viewpoints can be found on Figure 7.3 and Photomontages are provided in EIS Volume II - Figures.

Viewpoint 1: View from N28 Ringaskiddy

Viewer sensitivity: this view is from the N28 in Ringaskiddy. This view is available to the local community and passing traffic. The viewer sensitivity is medium.

Existing visual resource: the existing view is low lying and across parkland to the existing Ringaskiddy port area. Existing high mast lighting can be observed above a dense line of mostly coniferous trees that significantly restrict views out to the north. The view is therefore enclosed in character. The screening effect is enhanced by existing buildings that are visible between gaps in the trees. Due to trees and the low lying nature of the viewpoint it is not possible to view the open water of Cork Harbour nor the higher ground at Cobh on the northern side of the Harbour.

Predicted view: the operational phase will be well screened from this viewpoint by intervening trees and buildings. Additional high mast lighting will be visible from this location but will be similar to that currently present in the view. Occasional and intermittent glimpses of moving cranes will be potentially visible but only the upper portions of cranes will be visible.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be slight/moderate adverse.

Viewpoint 2: View from Priests Ave Ringaskiddy

Viewer sensitivity: this view is from a residential street in Ringaskiddy. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is slightly elevated above the adjacent N28 road allowing views over rooftops of properties that front onto the N28 towards the existing Ringaskiddy port area. Existing facilities at the port are visible including high mast lighting, silos and crane tops at the DWB. To the left of the view the industrial complex that includes the Pfizer factory is partly visible. Glimpse views above trees in the foreground are available to upper parts of both Monkstown and Cobh. However the view is predominantly enclosed in character.

Predicted view: the proposed operational phase will be well screened from this viewpoint by the adjacent buildings and trees. Additional cranes will be visible in the centre of the view that will be read with the existing cranes at the DWB. The upper portions of containers will also be partly visible. All ground level activities will be screened.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 3: View from R613 Ringaskiddy

Viewer sensitivity: this view is from the R613 in Ringaskiddy. This view is available to the local community and commuters. The viewer sensitivity is medium.

Existing visual resource: the existing view is along the vista created on the R613 by the tall stone wall located on the west side of the road and the trees that line the eastern side. Both the wall and the trees prevent views in any other direction than north towards the existing N28 and Ringaskiddy port. Trees located between the N28 and the port restricts views beyond. It is acknowledged that in winter months the mostly deciduous trees will allow partial views through the trees to the existing Ferry facilities in the port. A partial view to the settlement of Cobh is visible beyond the port. Ferry vessels berthed in the port will be a partly visible feature of the view.

Predicted view: the proposed operational phase will be well screened from this viewpoint by the existing trees. Ships berthed at the new facilities will be partly visible in winter months but similar to the existing Ferry vessels albeit on a more regular basis. Cranes and high mast lighting will also be visible. Road improvements at the entrance to the redevelopment will be the most noticeable component of the proposal in the foreground but read at a similar location to the existing road network.

Magnitude of change: the magnitude of change in visual resource is medium.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 4: View from Strawhill over Monkstown Creek

Viewer sensitivity: this view is from the local road L6470 at Strawhill in Monkstown. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is elevated allowing views from the roadside and over roof tops to Monkstown Creek. Beyond the Creek topography interrupts views to the existing Pfizer factory but a prominent water tower is visible on the skyline. The ADM jetty at the existing DWB is just discernible. Tall cranes at the existing DWB are also visible above intervening topography. Buildings at the National Maritime College are just discernible in the centre of the view being located at Ringaskiddy port. Ships will be a continual feature of the viewpoint coming and going from the DWB and the Ferry facilities. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed operational phase will be well screened from this viewpoint by the topography on the eastern side of the Creek. Taller cranes and ships will be visible but will be read

with the existing DWB cranes and ships with low change in visual resource when combined with the distance of the view. The wind turbines are the most dominant man made structure.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be slight/moderate.

Viewpoint 5: View from R610 across Monkstown Creek

Viewer sensitivity: this view is from the R610 at Monkstown Creek. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is low lying but open allowing views from the roadside across Monkstown Creek towards Ringaskiddy. Beyond the Creek topography interrupts views to the existing Pfizer factory but a prominent water tower and factory building are visible on the skyline. The ADM jetty at the existing DWB is just discernible but read with the background landscape. Tall cranes at the DWB are also visible above intervening topography. Buildings at the existing port and the National Maritime College are also visible in the centre of the view. Ships will be a continual feature of the viewpoint coming and going from the existing DWB and the Ferry facilities. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed operational phase at the DWB will be well screened from this viewpoint by the topography on the eastern side of the Creek. Taller cranes will be visible but will be read with the existing DWB cranes with little change in visual resource. The proposed port facilities on the eastern side of the port will be visible and break the skyline in the centre of the view. These facilities will be read in front of the National Maritime College. At the distance of the viewpoint from the new facilities the proposals will be noticeable but not prominent in the view and read with the existing port facilities and on-going activities in an active port. The panoramic view along the Creek is maintained. The wind turbines are the most dominant man made structure to the right of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 6: View from R610 across Monkstown Creek

Viewer sensitivity: this view is from the R610 at Monkstown Creek. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is low lying but open allowing views from the roadside across Monkstown Creek towards Ringaskiddy. Beyond the Creek topography interrupts views to the existing Pfizer factory but a prominent water tower and factory building are visible on the skyline. The ADM jetty at the existing DWB is just discernible but read with the background landscape. Tall cranes at the DWB are also visible along with a ship and buildings. Further buildings at the existing Harbour and the National Maritime College are also visible in the centre left of the view. Ships will be a continual feature of the viewpoint coming and going from the DWB and the Ferry facilities. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed operational phase at the DWB will be directly visible from this viewpoint but difficult to discern from the existing DWB with low change in visual resource. Taller cranes will be clearly visible in the centre left of the view along with containers (that will be difficult to discern) and will be read with the existing port facilities and tall cranes. The proposed port facilities on the eastern side of the port will be visible and break the skyline in the centre of the view. At the distance of the viewpoint from the new facilities the proposals will be conspicuous in the view but also read with the existing port facilities and on-going activities in an active port. The panoramic view along the Creek is maintained. The wind turbines are the most dominant man made structure to the right of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 7: View from Car Park Monkstown R610

Viewer sensitivity: this view is from the R610 at Monkstown. This view is predominantly available to the local community and occasional tourist. The viewer sensitivity is high.

Existing visual resource: the existing view is low lying but open allowing views from the roadside across Monkstown Creek towards Ringaskiddy. In the foreground of the view moored small leisure craft dominate and break up views towards Ringaskiddy. The masts of the yachts break the skyline across the width of the view. To the rear of the moored craft the existing DWB is visible in the form of cranes, silos and buildings and ships. Topography interrupts views to the existing Pfizer factory but a prominent factory building is visible on the skyline. The ADM jetty at the DWB is just discernible but read with the background landscape. Further buildings at the existing Harbour and the National Maritime College are also visible in the left of the view. Ships will be a continual feature of the viewpoint coming and going from the DWB and the Ferry facilities. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed operational phase at the DWB will be directly visible from this viewpoint but difficult to discern from the existing DWB with low change in visual resource. Taller cranes will be visible along with containers (that will be difficult to discern) but will be read with the existing DWB cranes. The proposed port facilities on the eastern side of the port will be visible and break the skyline in the centre of the view. As exhibited the masts from the leisure craft will (in summer months) offset the visibility of the facilities on the eastern side of the port. At the distance of the viewpoint from the new facilities the proposals will be conspicuous in the view but read with the existing port facilities and on-going activities in an active port. The wind turbines are the most dominant man made structure to the right of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 8: View from Diamond Road Monkstown

Viewer sensitivity: this view is from an elevated location at Diamond Road in Monkstown. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is elevated and offers a panoramic view above rooftops to Cork Harbour. To the centre and right of the view the Port facilities at Ringaskiddy are noticeable. The ADM jetty is visible in the open water. The tall cranes, buildings, silos and tanks at the DWB are visible. Ships coming and going to the existing facilities at Ringaskiddy Port will be a continuous feature of this view. The existing pharmaceutical factories at Ringaskiddy are the tallest features in the landscape at Ringaskiddy. The well treed promontory at Whitepoint is visible to the left. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: The proposed DWB extension will be located within this view but will blend with the existing DWB on the eastern side of the visible ADM jetty and ships are currently continually coming and going from this area. The proposed Multi-purpose Berth (MPB) will be located in the centre of the view and behind the visible ADM jetty. The lower level activities will be read against the background of development and hills at Ringaskiddy lowering their prominence. The tall cranes will only partially break the skyline (being largely read against the background hills) but are similar in height to existing cranes currently visible in the port. The panoramic view from Diamond Road will be maintained. The wind turbines are the most dominant man made structure to the left and right of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 9: View from Scotsman's Road Monkstown

Viewer sensitivity: this view is from an elevated location at Scotsman's Road in Monkstown. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is elevated and offers a panoramic view above tree tops to Cork Harbour and the existing Port facilities. To the right of the view the Port facilities at Ringaskiddy are noticeable. The existing DWB is visible with cranes, buildings, silos and tanks. The cranes do not break the visible skyline but are read against the background of urban development at Ringaskiddy and distant hills. The existing Ferry Terminal and berth and adjacent Port facilities at Ringaskiddy East are also visible but less clearly discerned due to the distance of the view. The well treed promontory at Whitepoint is visible to the left with the tall cranes at Rushbrooke breaking the skyline. The bridge to Haulbowline is just discernible to the rear of the trees at Whitepoint. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: due to the elevation of this viewpoint it will offer a view of the entire proposal. All new facilities at the DWB Extension and Ringaskiddy East will be located within this view. The proposed road improvements will not be visible and neither will the improvements at Paddy's Point. The proposals will be read with the existing port facilities located within this view offsetting the potential change in visual resource. The taller elements of the redevelopment at Ringaskiddy East will be also read against a background of urban development and taller hills that also limits potential change in visual resource. Ships coming and going from the existing facilities are currently a feature of this view. When these factors are considered with the distance of the view overall the proposals will be noticeable but not prominent. The wind turbines are the most dominant man made structure to the left and right of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 10: View the R610 Passage West

Viewer sensitivity: this view is from the R610 between Passage West and Monkstown. This view is predominantly available to the local community but also tourists. The viewer sensitivity is high.

Existing visual resource: the existing view is low lying and across open water to Cobh and Rushbrooke Harbour. Tall cranes at Rushbrooke break the skyline as do electricity pylons to the left of the view. Both the pylons and the Rushbrooke cranes are prominent in the view. Ships are a continuous and moving feature of this view visiting City Quay's and Tivoli upstream, Rushbrooke and less noticeably Ringaskiddy Harbour. The ADM jetty, a crane and buildings at the existing DWB are just discernible in the centre right of the view. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed DWB will be screened by topography. The proposed road improvements and works at Paddy's Point will also be screened. The proposed redevelopment works at Ringaskiddy East will be located within the centre of the view. The taller elements of these facilities will in part be read against the background of hills and urban development at Ringaskiddy but will partly break the skyline. Due to the distance of the viewpoint the proposed redevelopment will be noticeable but not prominent and read with the existing port facilities and taller cranes and ships at Rushbrooke in the foreground. The existing Rushbrooke port facilities and pylons will remain the most prominent features in the view. The wind turbines are a prominent man made structure to the rear of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 11: View from Whitepoint Drive

Viewer sensitivity: this view is from Whitepoint Drive in Cobh. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is low lying and across parkland to open water with Ringaskiddy beyond. The view is panoramic in nature and extends to the left beyond the limit of the camera towards Haulbowline. The existing port facilities at Ringaskiddy port are clearly visible with a ship at berth, cranes, buildings and tanks located within the view. The ADM jetty is just visible to the right of the view. As well as the existing port facilities there also extensive industrial buildings located to the rear of the port that breaks the skyline in the centre and right of the view. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed DWB extension will be partly visible in this view but read as part of the existing port facilities and against a background of existing port development. Similarly the Ringaskiddy East proposals will be read in part against the background of the existing DWB with its cranes and ships. The new cranes will be the most noticeable feature of the proposals. There will be an extension of port facilities to the left of the view but overall there is no loss of view from this viewpoint as the panoramic view up and down Cork Harbour is maintained. The wind turbines are a prominent man made structure to the right of the view.

Magnitude of change: the magnitude of change in visual resource is medium.

Significance of Visual Impact: the predicted significance of visual impact will be substantial/moderate adverse.

Viewpoint 12: View from Brookvale Cobh

Viewer sensitivity: this view is from Brookvale in Cobh. This view is predominantly available to the local community. The viewer sensitivity is high.

Existing visual resource: the existing view is elevated and across trees and houses towards Ringaskiddy port area. The landmark spire of Christchurch Church of Ireland is prominent in the foreground and interrupts the view to the DWB area. It is possible to discern a ship at berth and buildings but other details are more difficult to make up due to the distance of this view. Industrial buildings at Ringaskiddy to the rear of the port are noticeable due to their higher location on hilltops. The recently constructed wind turbines are prominent features in the view.

Predicted view: the proposed DWB extension will be well screened in this view. The proposed redevelopment at Ringaskiddy East will appear to the left of the existing DWB but the majority of the proposals will be read against the background of hills and urban development at Ringaskiddy. Ships coming and going are a feature of this view already. The road improvements and development works at Paddy's Point will not be visible. The wind turbines are a prominent man made structure to the right of the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 13: View from Lower Road Cobh

Viewer sensitivity: this view is from Lower Road in Cobh and is predominantly used by the local community and occasional tourists visiting the town centre. The viewer sensitivity is high.

Existing visual resource: the existing view is open and panoramic in nature. The view is across railway tracks to open water with the Naval Base at Haulbowline and Ringaskiddy in the background. The existing facilities at Ringaskiddy port are partly screened but there is a view to the upper part of one crane that breaks the skyline. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed DWB extension will not be visible and neither will the road improvements or the development works at Paddy's Point. The proposed redevelopment at Ringaskiddy East will be visible in part and largely read against the background hills but with the upper parts of cranes breaking

the skyline. Due to the distance of the view and the limited portion of the proposed redevelopment visible there will be low changes in visual resource. The panoramic view across the harbour is maintained. The wind turbines are the tallest man made structures in the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 14: View from Lake Road Cobh

Viewer sensitivity: this view is from a local road called Lake Road in Cobh and is predominantly used by the local community and occasional tourists visiting the amenity park as a viewing point. The viewer sensitivity is high.

Existing visual resource: the existing view is elevated and offers a panoramic view across the Harbour. The Naval Base at Haulbowline is a prominent visual feature with tall buildings, gantries, large tanks and lights. Beyond Haulbowline lies the National Maritime College. Moving further to the right of the view existing Ringaskiddy port facilities such as the Ferry Terminal are visible along with the facilities at the DWB. The cranes are not noticeable due to the fact that they are read against the background hills. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed redevelopment at Paddy's Point will be located directly in this view direction but will be difficult to discern due to the limited extent of the proposals and the distance of this view. Similarly the proposed DWB extension will be difficult to discern from the existing facilities at this part of the Harbour. The proposed redevelopments at Ringaskiddy East will extend port facilities to the left of the view. Such facilities will in part be read against the background of existing port and industrial development and the background hills offsetting visibility. The wind turbines the most prominent man made structures in the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 15: View from Cathedral Terrace Cobh

Viewer sensitivity: this view is from a local road directly in front of Cobh Cathedral in Cobh and is predominantly used by the local community and occasional tourists visiting the Cathedral as a viewing point. The viewer sensitivity is high.

Existing visual resource: the existing view is open and panoramic in nature. The view is across Cobh to open water with the Naval Base at Haulbowline and Ringaskiddy in the background. The existing facilities at Ringaskiddy port are partly screened but there is a view to the facilities at the existing DWB. The port facilities are difficult to discern and are read with the existing industrial development at Ringaskiddy that in some cases breaks the skyline. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed DWB extension will not be visible due to intervening topography and neither will the road improvements or the development works at Paddy's Point. The proposed redevelopment at Ringaskiddy East will be visible in part and largely read against the background hills and existing port facilities and industrial development at Ringaskiddy. Due to the distance of the view and the limited portion of the proposed redevelopment visible there will be low changes in visual resource. The wind turbines are the most prominent man made structures in the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 16: View from Haulbowline Bridge

Viewer sensitivity: this view is available from Haulbowline Bridge at Rocky Island. The viewer sensitivity is high.

Existing visual resource: the existing view is slightly elevated on the bridge. The view is directed between Rocky Island and Haulbowline Island towards Ringaskiddy port. The existing port facilities are visible but not prominent due to the distance of the view. It is just possible to discern details such as high mast lighting and three cranes due to the fact that they break the skyline. Existing buildings and silos are more noticeable. Beyond the port facilities the industrial buildings at Ringaskiddy are noticeable on the skyline. The ADM jetty is just discernible in the centre right of the view. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: It will not be possible to view the proposed road improvements or the development works at Paddy's Point. The DWB extension will be located within this view but read with the existing facilities at this location and difficult to discern. Ships coming and going are already a feature of this view. The proposed redevelopments at Ringaskiddy East will be located in the centre of the view and read against the background of the existing port facilities and industrial development that offsets the change in visual resource change. While the high mast lights and cranes do break the skyline such features are already part of the view albeit slightly more extensive. The wind turbines are the most prominent man made structures in the view.
Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 17: View from Martello Tower Ringaskiddy

Viewer sensitivity: this view is available from the Martello Tower located east of Ringaskiddy and that is accessed by a sign posted footpath and will be available to the local community and tourists. The viewer sensitivity is high.

Existing visual resource: the existing view is elevated and offers a panoramic view across the hill side to the open water of Cork Harbour. The foreground is dominated by electricity infrastructure. Beyond the open water Cobh is visible extending up the hillsides north of the Cork Harbour to the right of the view while Monkstown similarly extends up the hillside in the centre right. The existing DWB facilities are noticeable in the centre left of the view with a ship berthed and numerous cranes and buildings readily visible. Beyond the port facilities are located industrial buildings that sit on higher ground.

Predicted view: the proposed DWB extension will be located in this view direction but difficult to discern from existing facilities due to the angle of the view. Ground level activities at the Ringaskiddy East redevelopment works will be screened by topography and vegetation. The upper parts of cranes and containers will be visible however but largely read against the background hills.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

Viewpoint 18: View from R624 High Road Cobh

Viewer sensitivity: this view is from the R624 road in Cobh and is predominantly used by the local community and occasional tourists. The viewer sensitivity is high.

Existing visual resource: the existing view is open and panoramic in nature. The view is across Cobh to open water with the Naval Base at Haulbowline and Ringaskiddy in the background. The existing facilities at Ringaskiddy port are partly screened but there is a view to the facilities at the existing DWB. The port facilities are difficult to discern and are read with the existing industrial development at Ringaskiddy that in some cases breaks the skyline. The recently constructed wind turbines are the tallest man made features in the view.

Predicted view: the proposed DWB extension will not be visible due to intervening topography and neither will the road improvements or the development works at Paddy's Point that are screened by Haulbowline Island. The proposed redevelopment at Ringaskiddy East will be visible in part and

largely read against the background hills and existing port facilities and industrial development at Ringaskiddy although the upper parts of the cranes will partly break the skyline. Due to the distance of the view and the limited portion of the proposed redevelopment visible there will be low changes in visual resource. The wind turbines are the most prominent man made structures in the view.

Magnitude of change: the magnitude of change in visual resource is low.

Significance of Visual Impact: the predicted significance of visual impact will be moderate adverse.

7.5.6 Lighting Impacts

The operation of the port facility will require the use of outdoor night time lighting. Permanent lighting will be used in port operations during night time hours and for security at the proposed port facilities, Planning application drawings IBM 0474-GA-402; 403; 404; and 405 show the lighting plans. The container area will be lit by lights fixed on the yard cranes. The vessel docking areas will be lit by lights fixed on the ship to shore cranes.

The scheme mainly uses downward directional lighting, which reduces the sky glow effect. However, the addition of lighting to existing night views of the harbour will nevertheless result in a slight increase in sky glow on the night time views from many viewpoints around the harbour and draw attention to the extended part of the port facilities at night. Such lights will be read against the background of significant existing lights in the Ringaskiddy area and the impact is predicted to be slight adverse for night time views.

7.5.7 Construction Phase Impacts

During the construction phase potential impacts include:

(i) Site preparation/enabling works and operations
(ii) Site infrastructure and access for construction traffic
(iii) Vehicular and plant movements including dredging
(iv) Dust emissions

Chapter 3 of the EIS describes the potential phasing of the construction phase. The Ringaskiddy East works will be limited to 24 months, while the Ringaskiddy West works will be limited to 11 months. Works will be visible from within the ZVI during this location to a varied extent that will be related to the individual construction activity at any given time.

Ground level views of the site are restricted by intervening buildings and due to the low lying nature of the redevelopment site. Therefore due to the existing topographical characteristics of the site the construction works (particularly the surface works) will not be visible to the wider surrounding landscape.

The main visual receptors to be impacted will be the residents located around the harbour: residents of Ringaskiddy, Monkstown, Blackpoint and Whitepoint and Cobh, as these have a direct clear views over the harbour towards the redevelopment. Other identified sensitive visual receptors are likely to be less impacted, due to the large distance between proposed construction works and receptor.

The construction phase will also have associated activities that may affect sensitive visual receptors. Associated activities include the increase in traffic (mainly HGV). The increase in traffic will mainly impact the residents of Ringaskiddy on the west side of the village.

When viewed from the wider landscape the visual impacts during the construction phase will be slight adverse due to limited viewer exposure, phased and temporary nature of the works and low level of landscape and visual resource change.

7.5.8 Cumulative Impacts

A review took place of the planning history for the area to establish projects that might have a cumulative impact with the proposed Ringaskiddy Port Redevelopment. Amongst the projects included in the cumulative assessment were the approved Monkstown marina and the five large single wind

turbines being developed by Cork Lower Harbour Energy Group. The construction of the turbines had commenced at the time of this assessment for the proposed redevelopment and these turbines formed part of the baseline for this landscape and visual impact assessment. No significant cumulative effects were predicted for the combination of any proposed or planned project within the vicinity of the proposed Ringaskiddy Port Redevelopment.

7.6 Mitigation Measures

7.6.1 Landscape Mitigations Measures

Landscape mitigation measures are those taken to help reduce or remedy landscape and visual impacts or compensate for the loss of landscape value created by the redevelopment.

The aims of the landscape mitigations are:

- Screening to reduce the adverse visual impact of the proposal;
- Compensate for landscape impact where possible.

The design evolution of the proposed project has undertaken to enable incorporation of the following built-in design measures:

- Integration of constructed elements with existing elements such as existing roads and building sites and retention of trees
- Appropriate colour of fencing and structures
- As the cranes and gantries are predominantly read against the sky they will be mid-grey in colour rather than the usual blue or yellow
- Directional lighting

The existing port facilities and the openness of the harbour, and the size and the nature of the redevelopment do not allow for sufficient scope of mitigation by the implementation of soft landscape components to physically and visually integrate the proposed port redevelopment into the surrounding landscape. The proposal is fully waterside based; allowing vessels to dock, moving of cranes along the quay, container stacking directly behind it and the Roll on Roll off (RoRo) berth activities, do limit potential for any screening mitigation to be possible at the northern and western site boundaries for views from those directions, and from viewpoints located higher in the landscape around the proposed site.

The following specific landscape proposals have been put in place to reduce the landscape and visual impacts identified above:

- A relocated slipway and amenity area at Paddy's Point in the form of tree planting, shrub and hedge planting, grassing, amenity footpaths, seating, etc. to compensate for the loss of existing amenity as outlined on planning application drawing nr 1004.1.02
- Planting in the form of tree-lines and hedge planting adjacent to the southern site boundary and internal roads will provide screening for viewpoints located in the lower parts of Ringaskiddy as outlined on planning application drawing nr 1004.1.03
- Further planting will be provided on the northern boundary planning application drawing nr. 1004.1.04

7.6.2 Colours of Cranes

The visual appearance of the containers cannot be lessened as the colours, logos, etc depend upon the manufacturer and owner of the containers. The visual appearance of the cranes can be lessened by the use of appropriate colours. Cranes in bright and saturated colours, such as yellow, blue or red, will draw more attention than cranes with neutral colours. The colour shall be based on existing landscape and predominant sky colours and mid-grey in colour.

7.6.3 Lighting Mitigation

Mitigation measures have the potential to reduce construction and operational night time impacts, which would potentially be able to mitigate visual impacts by night. These include:

- Use of directional down light style cut-off luminaries to prevent up lighting and reduce glare and sky glow
- Use of down lighting style cut-off luminaries on any crane superstructures to prevent up lighting and reduce glare and sky glow
- Use of lighting control systems to reduce amount of light spill, sky glow, and visual appearance during periods of low activity (this measure will be more applicable during the construction phase as the port will run 24 hours a day)
- The use of flashing, moving, strobe, or blinking lights should be kept to a minimum

7.7 Residual Impacts

This section of the Chapter assesses the impact of the proposed redevelopment on the landscape character and visual receptors (previously identified in section 7.5 above), after the mitigation (described above in section 7.6) has been implemented.

The proposed relocation of the existing slipway and pier towards Haulbowline Bridge compensates for the loss of the existing slipway and pier. An amenity area at the relocated slipway with informal access to the foreshore will compensate for the existing area at the site used by walkers along the shore. However, the proposed amenity area is smaller than the existing area used for walking, and is located further away from the town centre of Ringaskiddy. Therefore the proposal will still have a slight adverse residual impact on the amenity of the site.

Within the wider landscape the proposal will continue to blend with existing ship and port activities with no significant residual landscape character impacts. With regards to visual impact on sensitive receptors impact on existing views will partly remain for some properties in Ringaskiddy in very close proximity but overall the visual impacts at dwellings are limited through time and the proposals will become a recognised feature of the local visual context.

In summary the broader landscape character area and visual context around Ringaskiddy Port area has the capacity to absorb a redevelopment of this scale in landscape and visual terms.

8.0 TRAFFIC & TRANSPORTATION

8.1 Introduction

This Chapter addresses the traffic and transport impacts that may arise from the proposed Ringaskiddy Port Redevelopment. These potential impacts relate to the transportation of goods and other ancillary traffic travelling to and from Ringaskiddy Port, including the traffic arising from the travel to work of Port employees. It should be noted that, to represent a worst case, the high growth scenario is assumed for the proposed redevelopment for the purposes of the traffic impact assessment.

The proposed Ringaskiddy Port Redevelopment includes the provision of a new Container Terminal, the extension of the Deepwater Berth (DWB) and the expansion and upgrading of Port facilities which will also accommodate the relocation of existing Port facilities from Tivoli and City Quays to Ringaskiddy. The proposed redevelopment of Ringaskiddy comprises the following:

- **Phase 1**: Ringaskiddy East including multi-purpose and container berths (to cater for additional Lift on Lift off (LoLo) and trade cars)
- **Phase 2**: Ringaskiddy West comprising the extension to the existing DWB (to cater for additional bulk)
- **Phase 3**: Ringaskiddy East comprising additional quay wall and other works (to cater for additional Roll On Roll Off (RoRo)). It should be noted that Phase 3 will not become operational until after the N28 upgrade is complete.

The strategic and local traffic and transport impacts associated with the proposed phases of redevelopment are discussed, assessed and evaluated in this Chapter for both the construction and operational elements of the expanded facility at Ringaskiddy.

8.1.1 Assessment Area

The assessment area for the traffic impact of the proposed redevelopment includes the three sites of Ringaskiddy, Tivoli and City Quays, as shown in Figure 8.1. The area included in the traffic model, extends beyond the assessment area in order to take full account of all potential traffic, including port traffic, which impacts the assessment area and as a result includes much of Metropolitan Cork as shown within the dashed line indicated in Figure 8.1.

Figure 8.1: Study Area

Figure 8.2 below provides an overview of the key national roads that link the Port at Ringaskiddy to most of the destinations of Port traffic, comprising its regional market hinterland, and which are accessed via the National Road Network including the M8 (to Fermoy/Mitchelstown), the N25 (to Middleton/Youghal), the N22 (to Macroom / Killarney) and the N20 (to Mallow / Limerick).

The principal access route to the Port of Cork facilities at Ringaskiddy is the N28 national road which connects the Port to the wider National Road Network via the Bloomfield Interchange on the N40 (South Ring Road). The N28 is currently a single lane carriageway road, incorporating at-grade roundabouts and priority junctions, with some climbing lanes along discrete sections. There are some infrastructure upgrades proposed within this network, including:

- an upgrade to the N28 (please refer to section 8.1.5)
- an upgrade to the Dunkettle Interchange (please refer to section 8.1.6)

In addition, arising from the An Bord Pleanála (ABP) approval of the Dunkettle Interchange development, a demand management study is being undertaken by the National Roads Authority (NRA) to identify demand management options for the N40 which will safeguard the efficient operation of the N40 well into the future.

The road network of interest in this assessment, therefore, includes the N28, the N40 South Ring Road, Bloomfield Interchange, the Jack Lynch Tunnel, Dunkettle Interchange, the N8/ M8 and the N25. This is henceforth referred to as the Ringaskiddy Port Access Corridor.

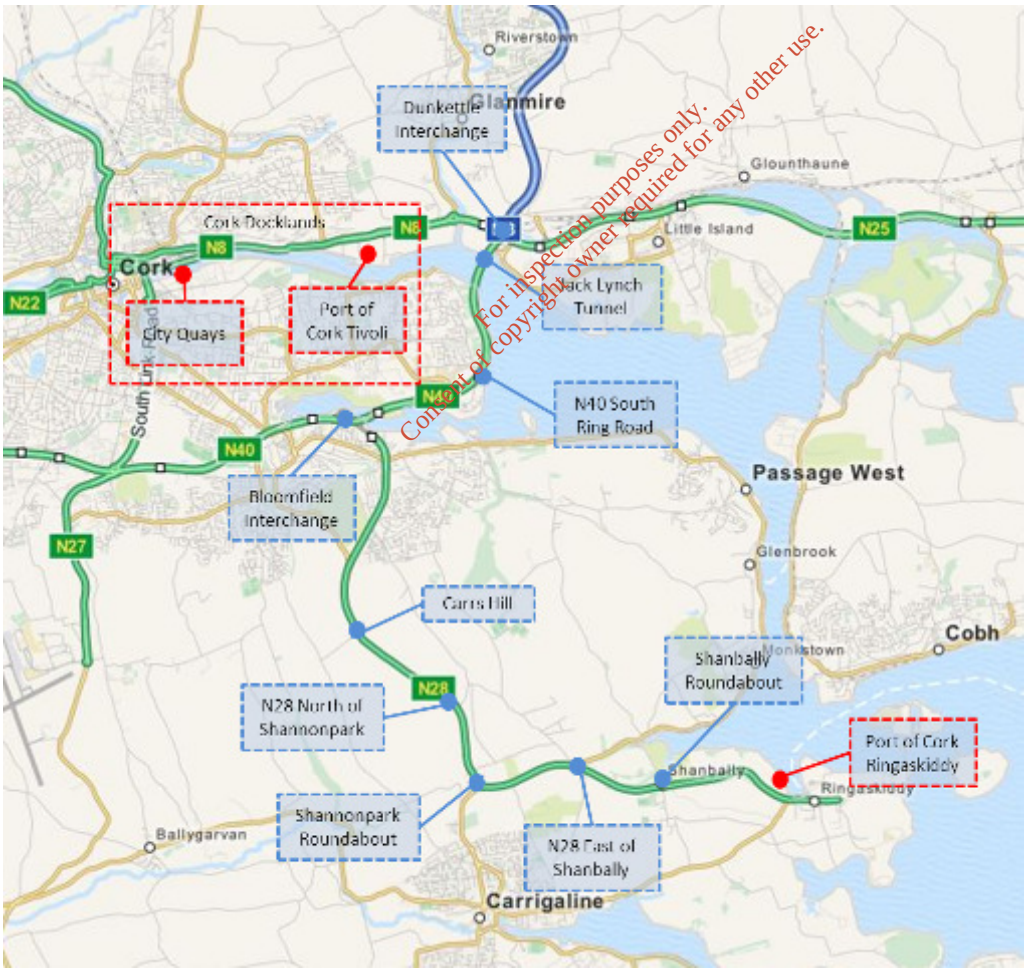


Figure 8.2: Ringaskiddy Port Access Corridor

8.1.2 Previous Proposal for Development at Ringaskiddy

In 2007, the Port of Cork submitted a Strategic Infrastructure Development (SID) application to ABP for a much larger container terminal and multi-purpose berth at Ringaskiddy (known as the Oyster Bank application). In 2008, ABP refused this application on two grounds. Firstly, it was considered that the traffic arising from the proposed level of development would generate traffic impacts of significance on the strategic road network in and around Cork City, and specifically at the Bloomfield, Dunkettle and Kinsale Road Interchanges, and at the Jack Lynch Tunnel. The lack of a rail option/ connection to transport freight from the site was the second reason for refusing the application.

It should be noted that the associated traffic generated by the previous Oyster Bank proposal would have been significantly higher than the traffic from the current Ringaskiddy Port Redevelopment because of the larger Port facility proposed as part of the Oyster Bank application.

8.1.3 Port of Cork Strategic Development Plan

Following the 2008 decision by ABP, the Port of Cork undertook a fundamental review of its Strategic Development Plan (SDP) and completely re-examined the future growth of its activities and port facilities. As a consequence of this strategic review, the Port of Cork have adopted significantly revised growth forecasts and development proposals which take full account of ABP's reasons for the 2007 Oyster Bank application refusal, and also take account of the subsequent significant downturn in the global economy and the economic growth forecast projections, both worldwide and in Ireland. These Port of Cork development proposals are set out in their 2010 SDP Review document which includes the currently proposed redevelopment at Ringaskiddy which has been fully endorsed by the 2013 National Ports Policy Statement referred to below.

8.1.4 National Ports Policy Statement

In 2013, the Department of Transport, Tourism and Sport (DTTAS) published the National Ports Policy Statement (NPPS). The policy introduces clear categorisation of the ports sector in Ireland, into Ports of National Significance (Tier 1), Ports of National Significance (Tier 2) and Ports of Regional Significance. The Port of Cork has been identified as a Port of National Significance (Tier 1).

The NPPS highlights that the Port of Cork is only one of two ports nationally, (the other being Dublin), capable of handling traffic across all five principal cargo traffic modes (LoLo, RoRo, Break Bulk, Dry Bulk and Liquid Bulk), and that the Port handles approximately 19% of all seaborne trade in the State.

Key points arising from the NPPS which are specifically relevant to the Ringaskiddy Port Redevelopment and this Chapter include:

- It is the Governments position that those ports considered to be of national significance must be capable of providing the type of Port facilities and the required capacity to ensure continued access to both regional and global markets for our export driven trading economy
- That Port master-planning is in line with international best practice and it is consistent with policy to improve integrated planning for all modes of transport. The NPPS emphasises the desirability of this process for the long term planning of all Ports of National Significance (Tier 1 & 2)
- The interconnections between the National Primary Road Network and the commercial Port network will continue to be of primary importance. This is recognised both in the NPPS and in the recently adopted 'Spatial Planning and National Roads – Guidelines for Planning Authorities' (Department of Environment, Community and Local Government, 2012). These state that "the primary purpose of the National Road Network is to provide strategic transport links between the main centres of population and employment, including key international gateways such as the main ports and airports"
- Efficient hinterland connections are critically important to any Ports' ability to facilitate large volumes of traffic. To inform considerations of future national Primary Road Network development, the National Roads Authority shall consult on a regular basis with the Department's Maritime Transport Division, as well as individual Ports of National Significance (Tier 1 & 2), on future network developments. (Note this provision of the NPPS can be related specifically to the recent decision of Cork County Council on behalf of the NRA to appoint consultants to prepare designs, and EIS and a Compulsory Purchase Order (CPO) for the

upgrade of the N28 elevating its current status and suggesting an upgrade to motorway or a 'high quality road' standard to provide greatly improved long term strategic road access to Ringaskiddy – discussed further below).

- It is desirable that the Port network have the potential to offer multi-modal distribution networks as part of its response to future changes that may arise in freight distribution. However, the NPPS acknowledges that most freight will continue to be carried by road due to the limitations of the rail network to connect with Port customers.

8.1.5 N28 Upgrade

Arising from the publication of the NPPS (March 2013), Cork County Council is currently proposing to improve the existing N28 from the Bloomfield Interchange with the N40 South Ring Road to Ringaskiddy village. As mentioned in Chapter 2 of this EIS, the Trans-European Transport Networks (TEN-T) are a planned set of road, rail, air and water core transport networks in Europe. As part of the TEN-T CORE network, it is anticipated that the proposed upgrade of the N28 will be constructed as a 'high quality road'. Further details of the upgrade are provided in section 8.4.1.

8.1.6 Dunkettle Interchange

Dunkettle Interchange comprises the junction of the N8, the N25 and the Jack Lynch Tunnel (N40) and suffers from significant congestion leading to delays and queuing during peak trafficked periods. In April 2013, ABP approved the Dunkettle Interchange Improvement Motorway Scheme and it is currently at notice to treat stage. Further details are provided in section 8.4.1.

8.1.7 N40 Demand Management Study

The N40 is currently heavily trafficked during peak periods. The recent ABP approval of the Dunkettle Interchange Improvement Motorway Scheme 2012 (Ref. PL04.MA0011) included conditions in relation to the monitoring and modelling of the impact of traffic growth on the operation of the N40 and the Jack Lynch Tunnel. In response to the ABP findings and the proposed developments in the Cork Area along the N40, the NRA are developing a demand management study to identify options to manage the impact of further traffic growth on the N40. The N40 Demand Management Study is due for completion in July 2014. Further details are provided in section 8.4.1.

8.1.8 Spatial Planning and National Roads – Guidelines for Planning Authorities - DECLG (2012)

These guidelines are very important in the context of the proposed redevelopment. The guidelines state that the '*primary purpose of the national road network is to provide strategic transport links between the main centres of population and employment, including key international gateways such as the main ports and airports, and to provide access between all regions*'.

The guidelines also state that '*strategic traffic, in the context of national roads, primarily comprises major inter-urban and inter-regional traffic, whether HGV, car, public transport bus services of other public service vehicles, which contributes to socio-economic development, the transportation of goods and products, especially traffic to/from main ports and airports, both freight and passenger related'.*

The guidelines clearly indicate that traffic generated by main ports (such as the Port of Cork) is of strategic importance and that the primary purpose of the national road network is to provide for strategic traffic.

8.1.9 Sustainable Transport Strategies

8.1.9.1 N28 Corridor Sustainable Travel Strategy (STS)

Cork County Council in association with the National Transport Authority (NTA) and the NRA is currently preparing a Sustainable Transport Strategy (STS) for the N28 Corridor. This will involve the management of commuter travel to and from Ringaskiddy through the delivery of sustainable travel options and the adoption of sustainable travel initiatives.

The N28 STS is intended to be a long term travel management and implementation framework for managing travel in the area, which encourages, supports and facilitates the greater use of sustainable travel choices among commuters, particularly single occupancy car users on the N28 route. The

increased use of sustainable travel modes will be encouraged through promotional initiatives and the provision of comparatively low cost infrastructure improvements on the existing travel networks. This will raise awareness of the choices of travel modes available and make it easier for commuters to make these choices, change their travel behaviour and benefit from sustainable travel options.

Specific measures will include an area-wide Mobility Management Plan and Workplace Travel Planning among the large scale employers including, the defence forces (Navy), IMERC and the National Maritime College in the Ringaskiddy area. The Port of Cork fully support the County Council N28 STS Initiative and have progressed their participation in the complimentary "Smarter Travel Workplaces" programme promoted by the NTA.

8.1.9.2 Port of Cork Smarter Travel Workplace

The Port of Cork has signed up to the NTA Smarter Travel Workplace initiative and is currently engaged with the NTA in this regard. In this context it is important to note that any mobility management measures employed by the Port of Cork are fully under their control, unlike for example mobility management measures which may be employed by other employers as part of the NTA Smarter Travel Workplace initiative. Therefore, no reductions in background commuter traffic due to the introduction of the N28 STS or the NTS Smarter Travel workplaces initiatives have been assumed in the traffic modelling of the proposed Ringaskiddy Port redevelopment in order to present the potential worst case scenario.

8.1.10 Rail Access

Following the refusal of the 2007 Oyster Bank application, a study was undertaken to consider the potential of a rail connection and use of rail freight for Port traffic (EIS Volume III a - Appendix 2.2). The overall aim of the study was to establish under what circumstances, if any, a rail connection to the Port of Cork would be feasible. The study found that, due to high costs, which outweigh any benefits, circumstances where a rail link serving Ringaskiddy Port might ever be feasible were unlikely. Some of the main reasons for this are, as follows:

- At present none of the customers of the Port are rail connected and they are dispersed widely throughout the region
- The volumes shipped are generally low and the distances travelled relatively short for a feasible rail operation which the NPPS suggests is greater than 300km

The socio-economic evaluation on the feasibility of rail freight from Port of Cork, considering the geographical distribution of the Port of Cork customers and their market, showed that the life cycle costs of a rail scheme significantly outweigh the benefits, even over 60 years.

8.1.11 Related Documentation

This Chapter has been prepared with reference to the following documents:

- National Ports Policy – Department of Transport, Tourism and Sport (DTTAS) (2013)
- Guidelines for Environmental Impact Assessment – Environmental Protection Agency (2013)
- Design Manual for Urban Road and Streets – Department of Environment, Community and Local Government (DECLG) (2013)
- Douglas Land Use and Transport Strategy – Cork County Council (2013)
- Spatial Planning and National Roads – Guidelines for Planning Authorities - DECLG (2012)
- A Study of Lane Capacity in the Greater Dublin Area – NRA (2012)
- Carrigaline Local Area Plan – Cork County Council (Interim Version August 2011)
- National Cycle Manual – NTA (2011)
- South West Regional Planning Guidelines – South West Regional Authority (SWRA) (2010-2022)
- Smarter Travel – A Sustainable Transport Future – NTA (2009)
- Cork County Development Plan – Cork County Council (2009)
- Environmental Impact Assessment of National Roads Schemes: A Practical Guide – NRA (2008)
- National Development Plan – Department of Environment, Heritage and Local Government (DEHLG) (2007-2013)
- Traffic and Transport Assessment Guidelines – NRA (2007)

- Traffic Management Guidelines – DEHLG, Department of Transport (DOT), Dublin Transportation Office (DTO) (2003)
- National Spatial Strategy - DEHLG (2002 - 2020)
- Design Manual for Roads and Bridges – NRA (2000)
- Cork Area Strategic Plan – Cork City and County Councils (2001-2020)
- Traffic Impact Assessment Guidelines – Institute for Highways and Transportation UK (1994)

A number of supplementary Traffic and Transportation reports have been developed to accompany this Chapter. These are detailed below in Table 8.1.

Table 8.1: Supplementary Traffic & Transportation Reports and Appendices (refer to EIS Volume III b for all Traffic and Transportation Appendices)

Appendix	Report	Description
Appendix 8.1	Preliminary Traffic Impact Assessment (TIA)	This report was submitted to ABP in February 2013. It presents a detailed discussion of the transport issues surrounding the application and includes initial traffic modelling analysis extracted from the NRA Dunkettle Traffic Model. This report provides a basis for assessing the likely impact and thus the viability of the proposed Ringaskiddy Port redevelopment.
Appendix 8.2	Baseline Report	The focus of the Baseline Report was to develop an understanding of existing travel patterns, public transport services and traffic conditions along the Ringaskiddy Port Access Corridor.
Appendix 8.3	Model Validation Report	This report describes the process used for developing the traffic model to be used for the Ringaskiddy Port redevelopment application assessment.
Appendix 8.4	Ringaskiddy Mobility Management Plan (RMMP)	This report considers local mobility management required for Ringaskiddy. Mobility management measures are presented which will achieve mobility targets, for example increasing walking/ cycling/ public transport use by employees and measures for managing HGV traffic.
Appendix 8.5	AADT Flows	This appendix shows AADT (Annual Average Daily Traffic) flows at various points in the network for each of the years and scenarios modelled.
Appendix 8.6	Background Traffic Growth	This technical note gives details on the methodology and assumptions used in preparing future year traffic growth forecasts.
Appendix 8.7	Trip Generation and Distribution	This appendix provides details on the trip generation and distribution resulting from the proposed redevelopment of Ringaskiddy Port.
Appendix 8.8	Core Modelling Results	This appendix details the modelling results from the core modelling scenarios which were tested.
Appendix 8.9	Construction Scenario Modelling Results	This appendix details the modelling results from the construction modelling scenarios which were tested.
Appendix 8.10	Mitigation Results (Core Scenarios)	This appendix details the modelling results from the mitigation measures which were tested for the core scenarios.
Appendix 8.11	Mitigation Results (Construction Scenarios)	This appendix details the modelling results from the mitigation measures which were tested for the construction scenarios.
Appendix 8.12	Sensitivity Test modelling results	This appendix details the modelling results from the sensitivity tests which were modelled.
Appendix 8.13	Sensitivity Tests Mitigation Results	This appendix details the modelling results from the mitigation measures which were tested for the sensitivity scenarios.
Appendix 8.14	Port Access Modelling Report	This report describes the local junction modelling which was carried out to test proposed changes to junctions used for Port Access at Ringaskiddy.

8.1.12 Key Assessment Terminology

Presented below are the key terms that are used throughout this Chapter to describe the traffic situation and potential impacts associated with the proposed redevelopment.

- **Heavy Goods Vehicles (HGVs)** are classified as Articulated / Rigid Trucks and Buses with 2 or 3 more axles and vehicles pulling.
- **Light Vehicles (LVs)** are classified as Cars, 4 Wheel Drive, Utility and Light Vans
- **Passenger Car Unit (PCU)** This is a unit of traffic volume, with 1 LV = 1 PCU and 1 HGV = 3 PCUs
- **Twenty Foot Equivalent Units (TEU)** Is the unit of port container traffic
- **Annual Average Daily Traffic (AADT)** This is an estimate of the average daily traffic volume at a location over the course of a year. Calculation of AADT involves dividing the total traffic volume in the year by the number of days in the year. The AADT is a measure of the total traffic over a road and thus is useful for indicating the cumulative impact of traffic on a road pavement. The AADT thus informs road pavement design and maintenance.
- **Peak Hour** is the time of the day that travel demand is at its highest, e.g. where there is a lot of commuter traffic, typically 8 to 9am in the morning when commuters are travelling to work and school with a corresponding peak in the evening, usually from 5 to 6pm. The PM peak is usually less pronounced than the AM Peak period because commuters return home over a wider spread of time in the evening on the return leg of the commute and school related travel typically occurs outside the evening peak. It should be noted that some employers in the Ringaskiddy Area operate on a shift basis with differing start and finish times outside the traditional peak periods of 8.00 to 9.00 and 5.00 to 6.00.
- **Ratio of Flow to Capacity (RFC)** is a means to describe the capacity of each approach road to a junction. An RFC below 0.85 implies an approach road is operating satisfactorily within capacity; between 0.85 and 1.0 RFC implies the approach road is operating within capacity but at less than optimal efficiency; above 1.0 RFC the approach road is deemed to be above capacity, that is to say when a road is at capacity a slight increase in traffic volumes can have a disproportionate impact on the length of queuing and delays.
- **Degree of (Junction) Saturation (DoS)** is another means of describing the capacity of each approach road to a junction. A DoS below 90% implies an approach road is operating satisfactorily within capacity; between 90% and 100% DoS implies the approach road is operating within capacity but at less than optimal efficiency; above 100% DoS the approach road is deemed to be above capacity which leads to disproportionate queuing and delays
- **Mean Maximum Queue (MMQ)** is a measure used to describe the queue formation at the approaches to junctions. The Mean Maximum Queue (MMQ) for each lane indicates the average of the Maximum Queue that occurs across all cycles, including Random and Oversaturated Queue components.

Figure 8.3 provides an overview of key traffic flow concepts used in the assessment of traffic and transport in this Chapter.

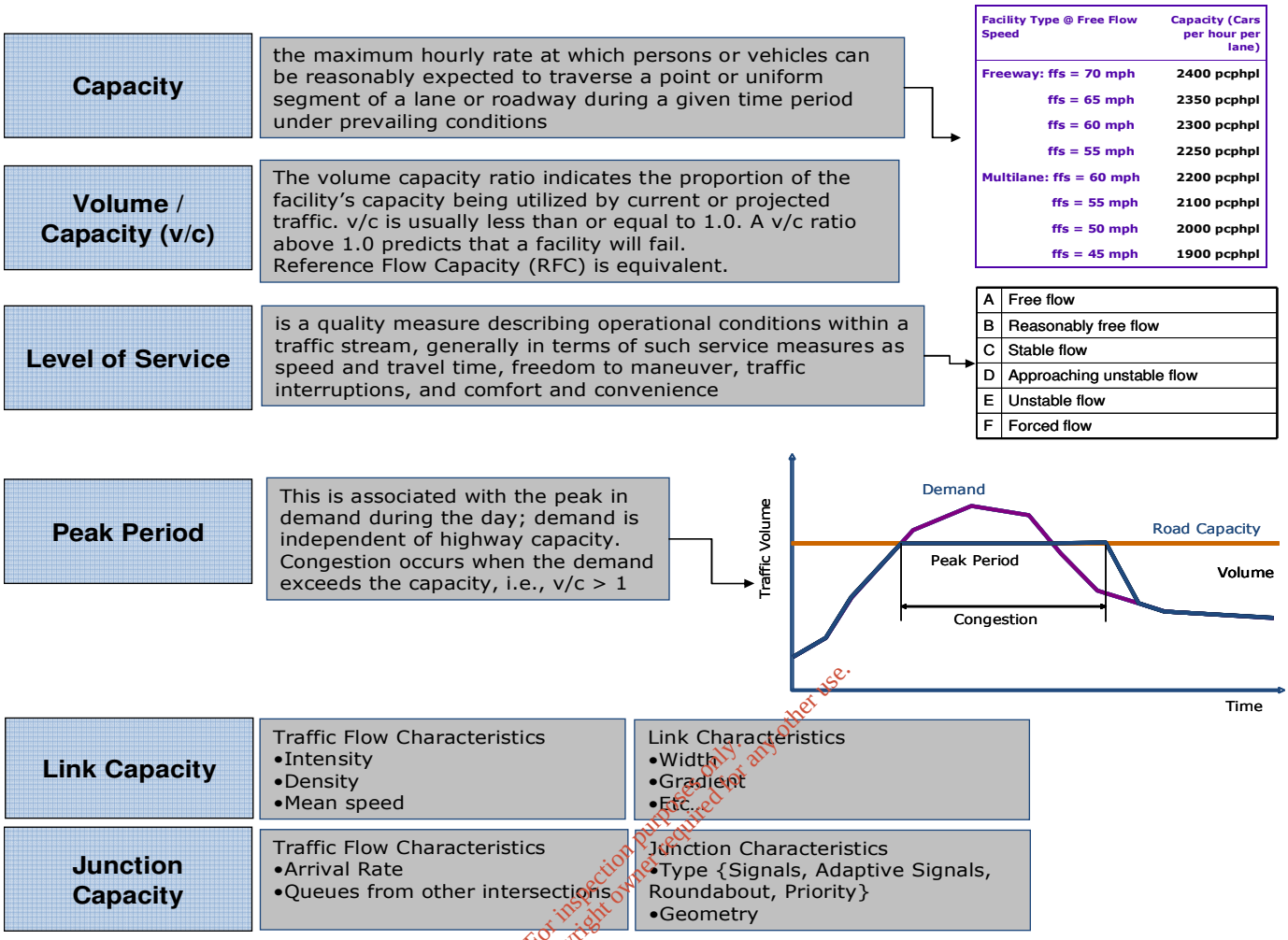


Figure 8.3: Traffic Flow Concepts

8.2 Assessment Methodology

The methodology for the Traffic and Transportation assessment is as follows:

- Prepare a baseline review in relation to the existing traffic situation, including consultation with Port of Cork hauliers, line agents, bulk operators, etc. and also Cork County Council, the NRA, the NTA, etc.
- Undertake strategic and local traffic modelling to assess base year and future year scenarios, with the proposed redevelopment ('Do Something') and without the proposed redevelopment ('Do Minimum') in place
- Evaluate the traffic modelling results which forecasts the impact of existing and future traffic on the road network.
- Identify any traffic impacts, develop and test proposed mitigation measures to remove and / or reduce any identified traffic impacts, and
- Determine any residual impacts arising from the forecast traffic combined with the proposed mitigation measures.

'Do Minimum' relates to a situation where the proposed redevelopment does not proceed, i.e. business as usual. Therefore, all traffic generated by Ringaskiddy Port would be similar to existing traffic levels having regard to anticipated growth over time.

'Do Something' relates to a situation where the proposed redevelopment is approved and proceeds as expected. When the proposed redevelopment is operational, additional traffic above the 'Do Minimum'

traffic levels will be generated. This additional traffic will be due to the increased capacity of the Ringaskiddy Port arising from the proposed redevelopment and will relate to the movement of goods associated with the increased levels of LoLo, Trade Cars, Bulks and RoRo cargo.

8.2.1 Baseline Report

As a first step, a baseline report (Appendix 8.2 in EIS Volume III b) was produced to determine the existing traffic conditions along the Ringaskiddy Port Access Corridor and surrounding areas. This report followed on from the initial Preliminary Traffic Impact Assessment (Appendix 8.1 in EIS Volume III b).

The baseline report includes a review of the existing road network and the operating transport conditions for vehicular traffic, walking and cycling infrastructure and public transport services. A number of site visits were carried out and traffic surveys were commissioned to determine the existing traffic levels and conditions. The baseline report also included a review of demographic information and latest Census data to understand existing levels of travel demand and traffic patterns on the surrounding road infrastructure. Policy documents relating to the area and other relevant background documentation were also reviewed.

As part of the baseline report, extensive consultations were held with many key stakeholders including liaising with the NRA to discuss the proposed N28 upgrade, the status of Dunkettle Interchange and the N40 demand management study and with Cork County Council to discuss any planned infrastructure and land use changes in the area. Meetings were also held with the NTA to agree the detailed methodologies for traffic modelling since this authority is now responsible for the development and maintenance of a proposed new regional transport model for the Cork Region and for the current Cork Area Strategic Plan (CASP) traffic model from which background traffic information for this traffic assessment was obtained. We also consulted with the Port of Cork regarding the Port access at Ringaskiddy, and the detailed mechanics of landside freight and bulk cargo operations at the Port in terms of traffic.

Furthermore, extensive consultation was also held with the customers of the Port of Cork including line agents, freight forwarders, hauliers and bulk operators who currently routinely use Port of Cork sites. All these key stakeholder companies were issued with a questionnaire requesting information about their current traffic movements. A workshop with the hauliers was undertaken in July 2013 and meetings were held with some line agents in July - August 2013 and some of the key bulk operators in September 2013. Site visits were undertaken to Dublin Port and Port of Rotterdam to observe their traffic and transport management and operations in relation to Port traffic. Finally, Port of Cork employees were surveyed on their existing travel patterns as part of the NTA Smarter Travel Workplace Programme and the results of these surveys were assessed.

8.2.2 Traffic Model Development

In order to fully assess the traffic impacts of the proposed redevelopment, the Port of Cork Strategic Traffic Model (PoCSTM) was developed. The CASP SATURN traffic model, which was upgraded in 2010 for the Dunkettle Interchange Study, was used as a base for developing the PoCSTM. It was felt that this was the most appropriate model as it maintained the required consistency of approach with the Dunkettle Interchange traffic assessment as the modelling of N40 traffic had been reviewed by ABP during the Dunkettle EIA and Oral Hearing. (It also represented the most up to date traffic model for the area.)

The key steps for the traffic modelling assessment are presented in Figure 8.4..

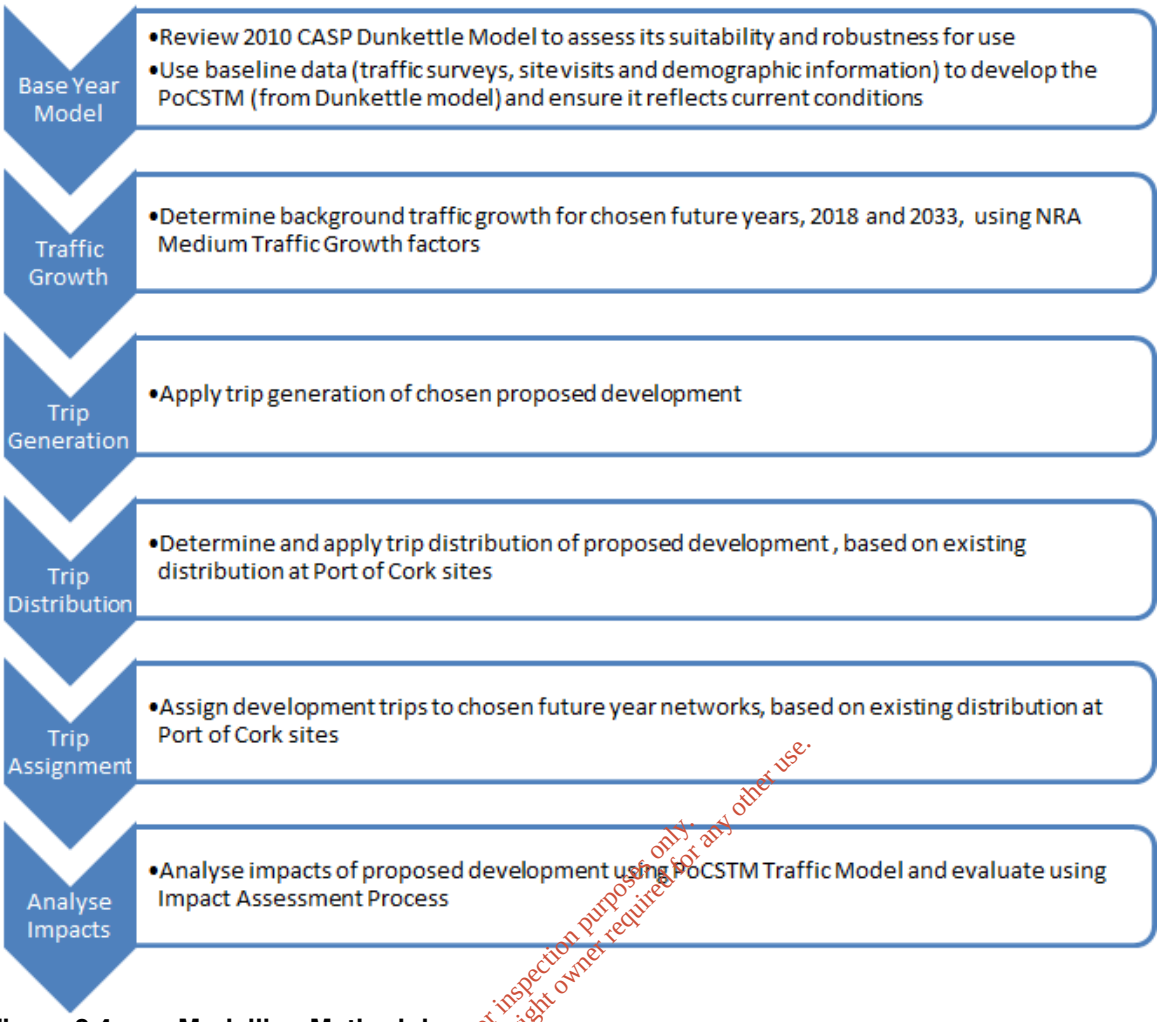


Figure 8.4: Modelling Methodology

The objective in developing the PoCSTM was to develop a traffic model that accurately reflects current traffic conditions in the study area at a sufficient level of detail to allow for an accurate traffic assessment. The decision to proceed with the preparation of the proposed redevelopment proposal was taken in 2012 and therefore current traffic conditions refers to 2012 as the base year for the traffic model. The model software used is the SATURN (Simulation Assignment of Traffic to Urban Road Networks) suite of transportation modelling programs. Two peak hour models were developed for the study area shown previously in Figure 8.1 to represent the:

- AM Morning peak period
- PM Evening peak period

These modelled periods reflect peak traffic conditions on the road network (in terms of queuing and congestion) in the morning and evening commuter peaks.

The trip demand matrices, representing base year (2012) traffic, were developed for the PoCSTM using extensive survey traffic data collected in 2012. The demand matrices were segregated into three vehicle types (or user classes), as follows:

- User Class One - Light Vehicles.
- User Class Two – HGVs not related to the Port of Cork.
- Use Class Three – HGVs related to the Port of Cork only.

Please refer to Appendix 8.3 in EIS Volume III b, the PoCSTM Model Validation Report, which contains a full description of the PoCSTM development process including information on the model validation process.

8.2.3 Evaluation of Traffic Modelling Results

The traffic model is used to inform the various aspects of the EIS including Air, Noise and economic assessment as well as being used to determine traffic impacts associated with the proposed redevelopment (which is the main focus of this Chapter).

The area of impact of the proposed redevelopment is defined as roads where Annual Average Daily Traffic (AADT) flows increased by more than 5% due to traffic generated by the proposed redevelopment. The AADT flows within the area of impact were supplied to the EIS team and used to assess the environmental impact of the traffic from the proposed redevelopment. (i.e. Air, Noise, Economic, etc.) The AADT flows in the area of impact are shown in Appendix 8.5 (refer to EIS Volume III b).

The traffic impact of the proposed redevelopment is assessed using the aforementioned PoCSTM and considers the AM and PM peaks when traffic congestion is at its most critical in the Cork area. Key Performance Indicators (KPI) have been identified to assist in the assessment and evaluation the redevelopment has on peak period traffic. Each of the KPIs is quantifiable to allow the scenarios tested to be easily compared against one another to determine traffic related impacts.

The following KPIs are used to determine peak period traffic impacts:

- Journey Times on Key Routes
- Traffic Diversion Factor
- Volume over Capacity ratio at Key Junctions (i.e. a measure of congestion levels)

Journey times on key routes are considered to determine the traffic impact of the proposed redevelopment on the strategic road network, the traffic diversion factor measures the extent to which traffic re-routes away from a junction or road due to increased traffic arising from the proposed redevelopment and volume over capacity/ degree of saturation ratios at key junctions are considered to take account of local traffic impacts. All three KPIs are used for the traffic impact assessment as a KPI may reveal a traffic impact that is not picked up by another KPI. For this reason all three KPIs are used to inform the full range of potential traffic impacts.

The impacts of the proposed redevelopment, both at the strategic and at local levels, are rated as negligible, minor, moderate or major, as appropriate and these categories are described as follows:

- ***Negligible:*** effects that are of such low importance that they are not material to decision-making
- ***Minor Significance:*** effects that are of low importance in the decision-making process
- ***Moderate Significance:*** effects of the redevelopment that may be judged to be important at a local scale (i.e. in the planning context) only
- ***Major Significance:*** effects of the redevelopment which are of greater than local scale importance (i.e. strategic significance)

The likelihood (low, medium or high) and duration (short, medium or long term) of the predicted impacts is also assessed and noted. As per Environmental Protection Agency (EPA) EIS guidelines, short-term equates to 1-7 years, medium term is between 7 and 15 years and long term is between 15 and 60 years. This method of rating impacts allows the traffic modelling scenarios to be compared in a clear, concise and measurable way.

Mitigation measures of traffic impacts of major significance identified are developed and are further evaluated.

The remaining residual impacts are also considered.

8.3 Existing Traffic Conditions

The Baseline Report, contained within Appendix 8.2 in EIS Volume III b, contains an outline of the existing traffic conditions including, existing travel behaviour, demographic trends and travel demand within the study area. In summary, the baseline report:

- Focuses on establishing current travel patterns and traffic conditions, specifically in terms of providing information on the travel patterns of traffic related to Port of Cork activities, including vehicles transporting goods to / from Port sites, the travel undertaken by employees of the Port and Port businesses and an understanding of their needs and views
- Includes a detailed summary of current traffic conditions in the study area in terms of infrastructure for each transport mode, utilisation of that infrastructure and conditions experienced by the infrastructure users
- Includes a review of national and regional guidelines and other transport studies relevant to the study area, specifically detailing the relative implications and outcomes in each case

8.3.1 Existing Road Hierarchy

Figure 8.5 illustrates the road hierarchy in the study area. This figure illustrates that a number of national primary roads pass through the study area, shown below in Table 8.2, namely:

Table 8.2: National Primary Roads within Study Area

Road	Name	Description
N28	Cork City to Ringaskiddy	provides connections from the wider National Road Network via the Bloomfield Interchange at the N40, to the major employers based in Ringaskiddy and Carrigaline, the Naval base at Haulbowline, IMERC, the Maritime College and Port of Cork at Ringaskiddy
N40	Cork Southern Ring Road	is a major national primary distributor road allowing access to the wider National Road Network including the M8/ N8, and the N25, via the Dunkettle interchange; the N27 Cork City South Link Road via the Kinsale Rd Interchange; the N20 via the N27 and City Centre; the N22 and N71 via the Bandon Road Interchange
M8/ N8	Cork City to Dublin City (via M7)	motorway standard from the M7 to the Dunkettle Interchange
N20	Cork City to Limerick City	connecting the cities of Cork and Limerick. Croom, Charleville, Buttevant, Mallow and Blarney are the principle towns along the route
N22	Cork City to Tralee	goes through counties Kerry and Cork, from Tralee in the west through Killarney, Macroom and Ballincollig to Cork City
N25	Cork City to Rosslare	from Cork to Rosslare Europort via Waterford City
N27	Cork City to Kinsale	from Cork City Centre to Cork Airport and onwards to Kinsale

There is one secondary route in the study area:

- N71 – Secondary route from Cork City to Bandon Clonakilty and further south / south-west which can be accessed via the N40 South Ring Road.

There are also a number of regional and third class roads in the study area, including:

- R610 – Cork City through Douglas, Passage West and Monkstown
- R635 – North Ring Road
- R613 – Church Road

- R639 – the old N8 road to Glanmire

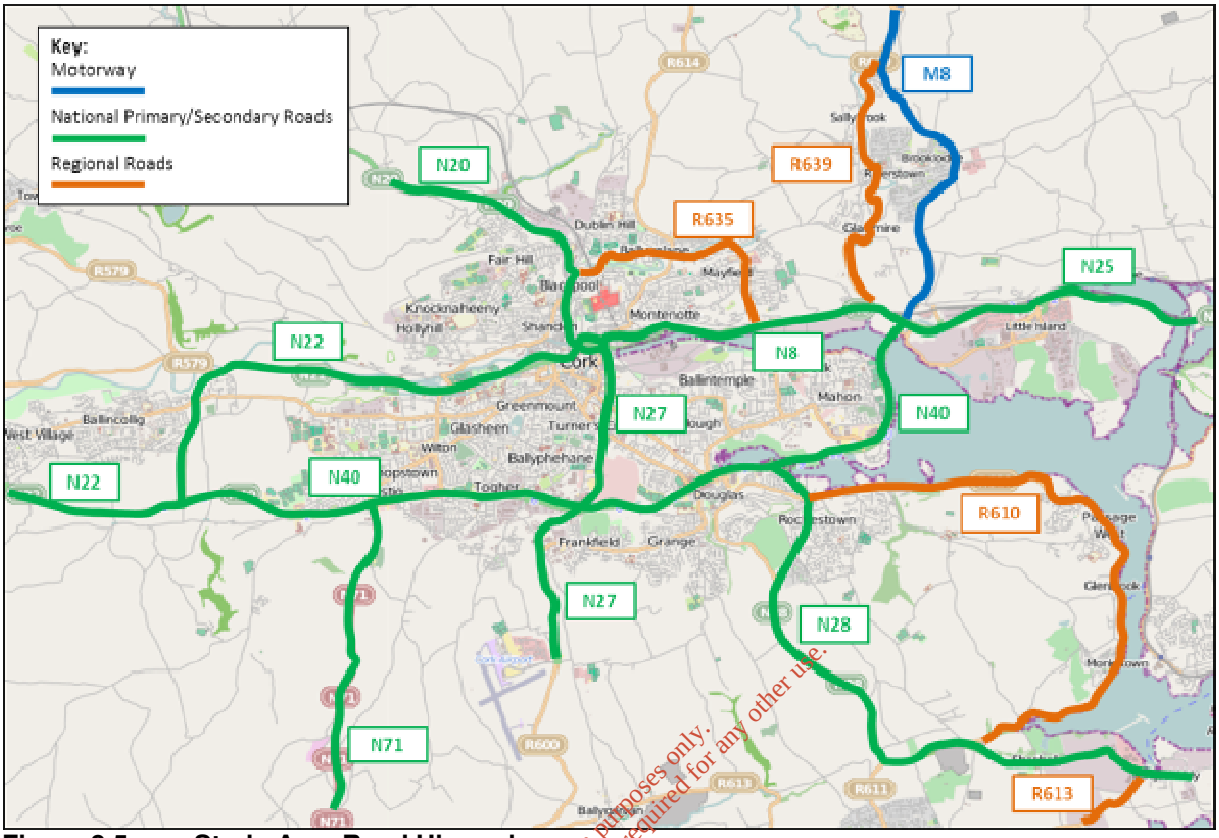


Figure 8.5: Study Area Road Hierarchy

8.3.2 Existing Traffic Volumes

An extensive set of survey data was reviewed and assessed in order to get a clear understanding of existing traffic movement and conditions within the study area. The traffic survey analysis includes the following:

- Journey time surveys, queue length and traffic condition site observation surveys undertaken in April 2013 and updated in November 2013 throughout the study area
- Manual Classified Counter (MCC) surveys commissioned as part of this study, April 2013, at:
  - Cork Road/ Church Road roundabout
  - Fernhill Road/ Church Road
- Traffic surveys at Tivoli and Ringaskiddy ports, including turning counts at the Ferry Terminal, conducted in May 2012
- Road Side Interviews at Tivoli and Ringaskiddy and observations at City Quays, conducted in May 2012
- Journey Time surveys along the N28 between Shannonpark Roundabout and Ringaskiddy, conducted in May 2012
- Automatic Traffic Counter (ATC) surveys at Bloomfield Interchange and along the N28 between Shannonpark Roundabout and Ringaskiddy, conducted May 2012
- ATC surveys along the N28 and other roads in the vicinity of Douglas/ Rochestown, conducted in April 2012
- MCC surveys along roads in the vicinity of Douglas/ Rochestown, conducted in April 2012
- MCC surveys near Dunkettle and Cork City undertaken as part of the update of the CASP traffic model in November 2012
- NRA traffic counters along the N25 and N8 in recent years

Survey locations for each of the above surveys are illustrated in Figure 8.6.

Figure 8.6: Traffic Survey Locations

8.3.2.1 Traffic Survey Results

Full details of the results of all the surveys listed above can be found in the Baseline Report in Appendix 8.2 (refer to EIS Volume III b). The remainder of this Chapter will focus on the survey results along the key Ringaskiddy Port Access Corridor (N28 and N40).

Figure 8.7 shows the AADT values along the N28 and N40 in April/ May 2012. The volume of traffic on the N28 West of Ringaskiddy is 11,200 vehicles, increasing to 15,300 vehicles east of Shannonpark, on average per day. North of Shannonpark the traffic volumes increase to nearly 31,100 vehicles approaching Bloomfield Interchange and 56,400 on the N40 Southern Ring Road (SRR) at the Jack Lynch Tunnel.

It is worth noting that the 2013 AADT traffic flows provided by the NRA as part of the N40 Demand Management study recorded the following:

- 23,024 vehicles on N28 (Carrs Hill) – of which 3.0% are HGVs
- 59,130 vehicles on N40 approaching Jack Lynch Tunnel – of which 4.1% are HGVs

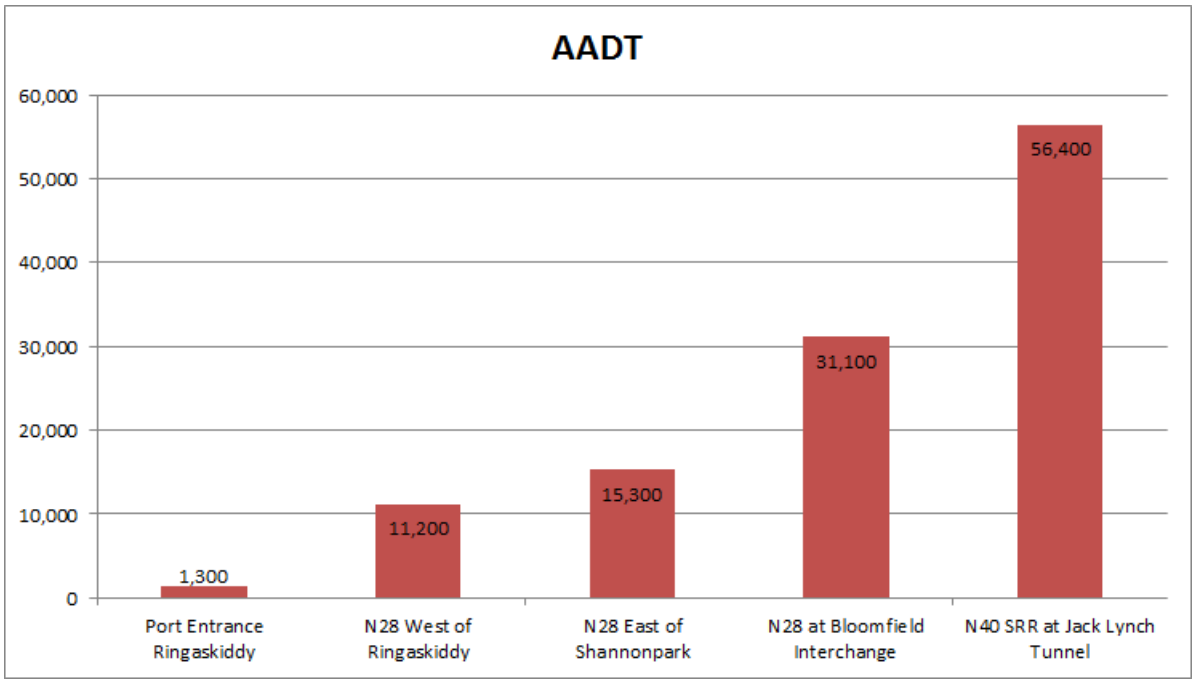


Figure 8.7: 2012 AADTs at different Locations along the Port Access Corridor

Currently, the N28 is well used by HGVs. A proportion of these are destined for the Port of Cork and the major pharmaceutical companies located in Ringaskiddy. A summary of the surveyed peak volumes of HGVs (generated by Ringaskiddy Port and other Ringaskiddy companies) through Shanbally is as follows:

Shanbally (West of Junction)

- 66 HGVs (5% of total traffic) of which approximately 46 are Port HGVs – during AM Peak (08:00 – 09:00)
- 13 HGVs (1% of total traffic) of which approximately 10 are Port HGVs – during PM Peak (17:00 – 18:00)

8.3.3 General Traffic Conditions

During a series of site visits undertaken in 2013 (April and November), as illustrated in Figure 8.8 and Figure 8.9, relating to general traffic management along the N28, it was noted that the N28 experiences congestion in the AM and PM peaks at different locations along the route and there is a high volume of traffic spread over the peak periods.

Operational analysis undertaken as part of the N40 Demand Management Study has been reviewed, and this highlighted traffic operational issues along the N28 at Carrs Hill and at the approach to the N40. This study also highlights operational issues during commuter traffic peak periods along the N28. Importantly the PoCSTM represents these locations of congestion and operational issues in the AM and PM Peak periods.

Existing traffic congestion

Picture 1 shows congestion on the N28 during the AM (around 10-15 minutes leading up to 08:00), where traffic queues from the junction with the R610 (Raffeen Cross) to the Shanbally Roundabout towards Ringaskiddy.

Picture 2 shows high levels of free flowing traffic at Shanbally Roundabout travelling towards Ringaskiddy during the AM peak with peak congestion from 07:45 - 08:30.

Picture 3 shows traffic congestion at the Shannonpark Roundabout on the approach from Ringaskiddy in the PM peak with peak congestion from 17:00 - 18:00.

Picture 4 shows traffic congestion at the Shannonpark Roundabout on the northern arm (from Cork City) in the PM peak (17:15 – 17:30)

Picture 1 – N28 AM Peak

Picture 2 – Shanbally AM Peak

Picuture 3 – N28 PM Peak

Picture 4 – Shannonpark PM Peak

Figure 8.8: Existing Traffic Congestion on the N28

N28 between Ringaskiddy & Shanbally

- Traffic delays are most significant through Shanbally Village, eastbound towards Ringaskiddy during the early morning peak (around 07:45 and lasting for up to 08.30 on average). There is also increased traffic levels and congestion in the PM Peak between 17.00 and 18.00
- At other times of the day, outside the peak periods, traffic delays are not significant as traffic levels are significantly less than in the peak periods

N28 between Shanbally & Shannonpark

- Traffic delays are significant at the Shannonpark Roundabout from Carrigaline and on the N28 southbound, north of Shannonpark, during the morning peak (08:00 – 09:00)
- In the evening peak, traffic delays occur at Shannonpark Roundabout from Ringaskiddy (westbound) and also along the N28 southbound (17:00 – 18:00)

N28 between Shannonpark & Bloomfield

- The sections with most notable congestion were at Carr's Hill and the Maryborough Hill merge. Traffic queues form at each of these sections in both directions at different times during both the AM and PM peaks (mostly significantly 08:30 – 09:00)

N40

- Traffic on the N40, in the vicinity of the study area, is generally free flowing until it reaches the Kinsale Roundabout at the junction with the N27 (west of the study area). Both eastbound and westbound traffic on the N40 also experiences delays accessing the Mahon Point Interchange to the east of the study area during peaks (08:00 – 09:00 and 17:00 – 18:00)

Jack Lynch Tunnel

- Capacity and operational issues at the Dunkettle Interchange cause delays in the Jack Lynch Tunnel. It was observed during site visits that the Jack Lynch Tunnel experienced tailbacks past the tunnel towards the Mahon Interchange on approach to the Dunkettle Interchange in both peaks (08:00 – 09:00 and 17:00 – 18:00). Traffic was moving at approximately 5-10kph which subsequently had a knock-on effect on traffic moving towards the Mahon Interchange

Dunkettle Interchange

- There are capacity and operational issues which result in congestion at Dunkettle Interchange. Queuing was noted during the site visits in both the AM and PM peak in all directions. The capacity at the Dunkettle Interchange is not sufficient during the peak to accommodate the volume of traffic during that period without the build-up of queues on all approaches. However, traffic flowed well during the off-peak periods with green time sufficient to clear all queues that had built up while waiting during each signal phase. A planned upgrade of the junction to provide free flow on all principal movements which has been approved by ABP will alleviate these delays during peak periods

The traffic delays along the N28 and associated queuing (indicative) are summarised in the figure below. The morning peak varies along different sections of the N28 and generally occurs earlier closer to Ringaskiddy. For the purposes of modelling, we have taken the morning peak as being 07.45 – 09:00 and the evening peak as being 17:00 – 18:00. Importantly, the traffic modelling replicates the peak period congestion at the above key locations.

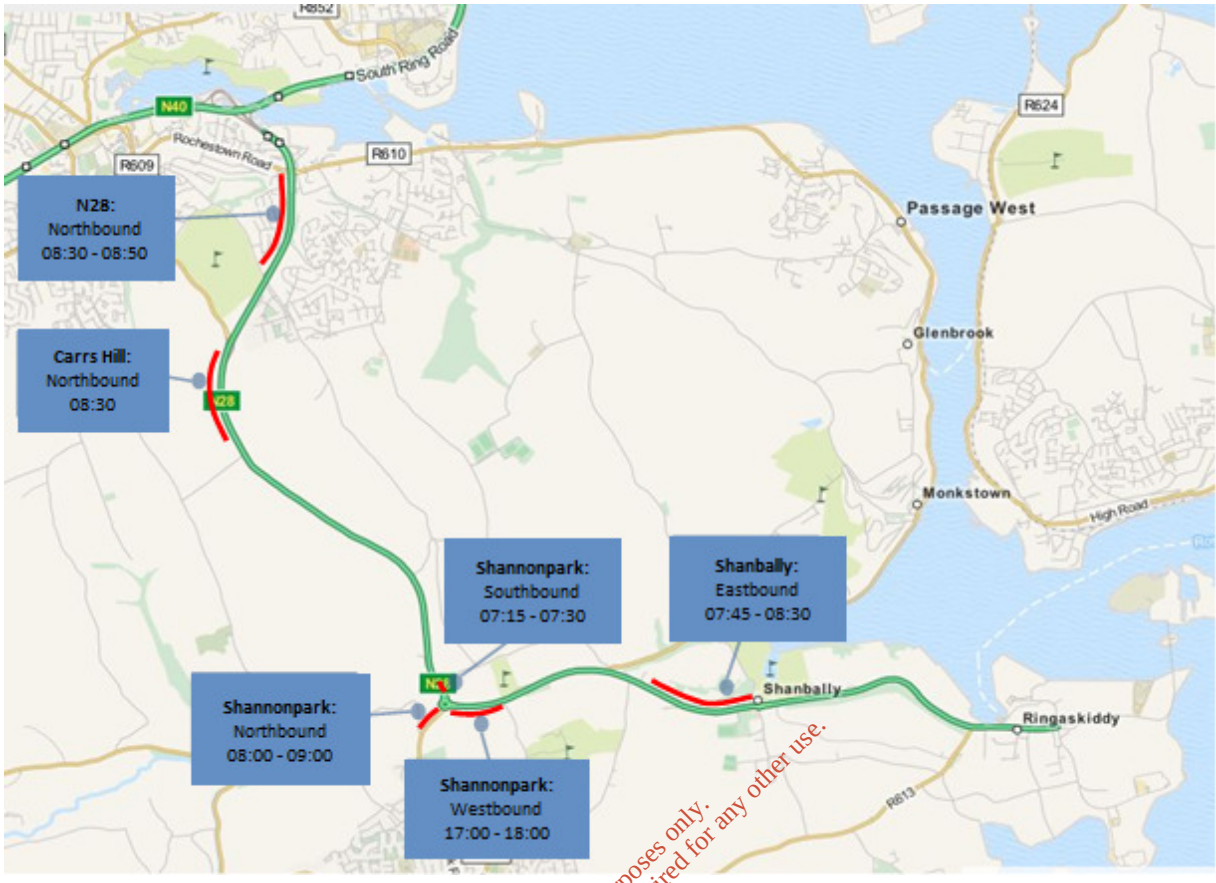


Figure 8.9: Existing Traffic delays along the N28

8.3.3.1 Accident Data

To understand the existing level of accidents along the N28, accident data was taken from the Road Safety Authority website, as tabulated in Table 8.3 and illustrated in Figure 8.10. It shows that there have been *10 fatal accidents along the N28* in the years between 2005 and 2011. Of these fatal accidents, one occurred on the N28 east of Shannonpark Roundabout in 2011. Seven more occurred on the N28 north of Shannonpark Roundabout and two near the Bloomfield Interchange. There was one serious accident on the N28 east of Shannonpark Roundabout in 2008. Two more occurred on the N28 north of Shannonpark Roundabout and two near the Bloomfield Interchange. A number of minor accidents were recorded along the N28, some of which happened in Ringaskiddy, Shanbally and near Shannonpark Roundabout.

Table 8.3: Accident Statistics along the Ringaskiddy Port Access Corridor

Year	Fatal	Serious	Minor
2011	2	-	10
2010	3	-	6
2009	-	1	2
2008	-	2	4
2007	-	-	9
2006	2	1	6
2005	3	1	4
Total (2005-2011)	10	5	41

Of these fatal accidents, it is important to note that ***none involved a heavy goods vehicle***. Of the minor accidents, one involved a goods vehicle at Raffeen Cross in 2011 and on the approach to Bloomfield Interchange in 2007.

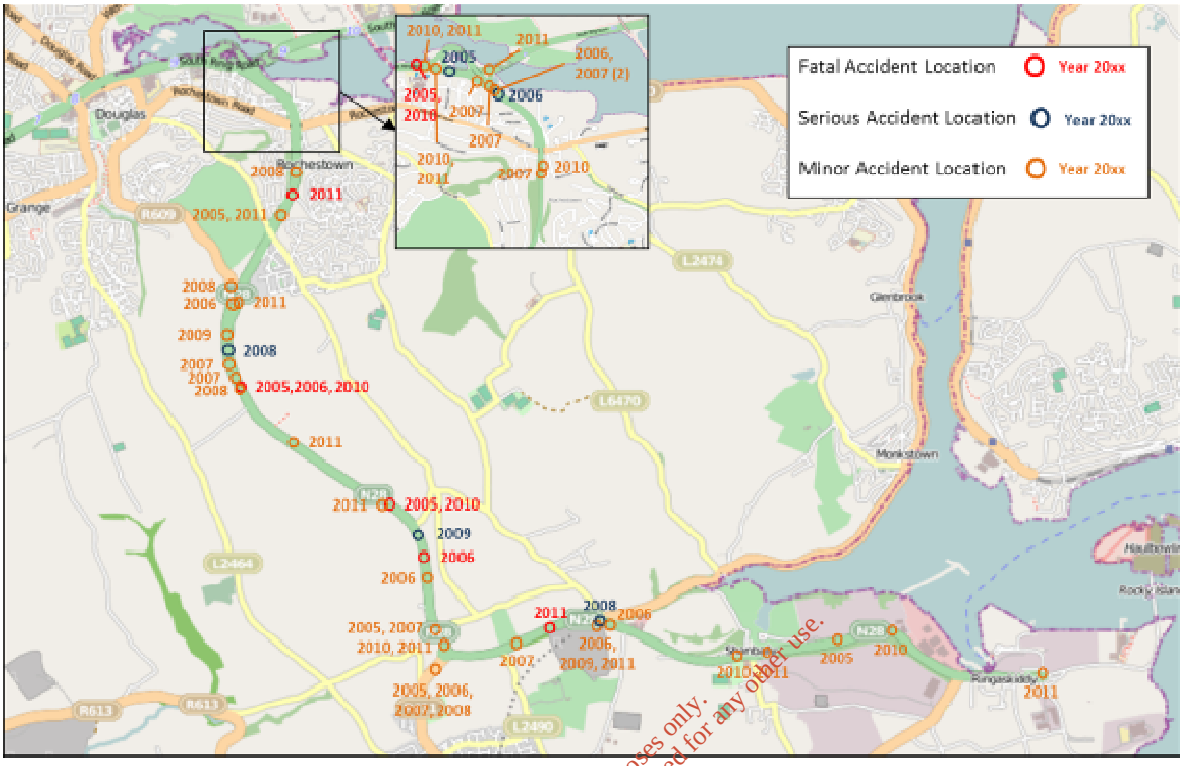
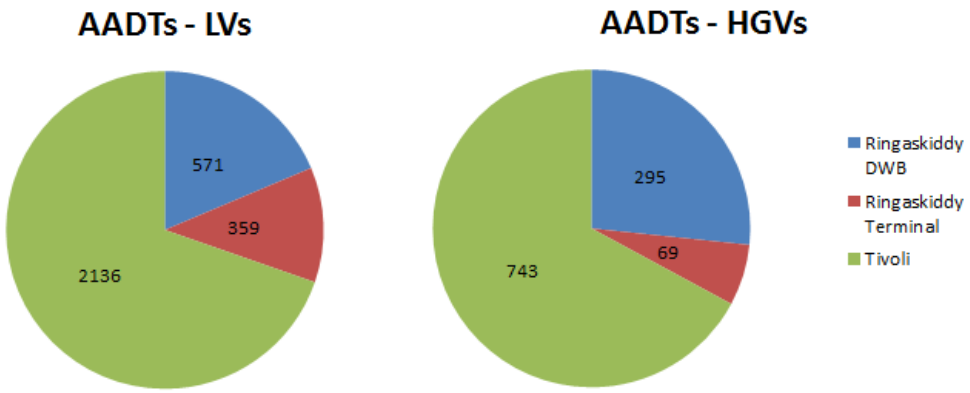


Figure 8.10: Accident Data

8.3.4 Existing Port of Cork Facilities

The Port of Cork carries out its operations at a number of Port facilities located around Cork Harbour and the traffic flows generated by its main activities at Ringaskiddy and Tivoli are summarised in Figure 8.11 below.



Source: Independent Traffic Surveys April/ May 2012

Figure 8.11: Traffic Totals for Port of Cork Sites (weekday average)

As shown above in Figure 8.11, the current estimated traffic demand generated by Port of Cork activities at Tivoli and Ringaskiddy have a combined total of 4,174 vehicle movements per day (AADT), of which some 27% or 1,108 are HGV movements. No survey data was recorded at City

Quays due to the nature of its layout, however it is known that the traffic flows relating to the Port facilities are relatively low. However it is known that the existing traffic flows and profiling at City Quays are very similar to the current traffic accessing the Ringaskiddy DWB. Table 8.4 shows the traffic flows that are currently generated from its existing operations at Ringaskiddy.

Table 8.4: Ringaskiddy – Existing Traffic Levels (weekday average)

	Ringaskiddy Terminal	Ringaskiddy DWB	Total
AADT	429	866	1295
LV Nos.	359	571	930
% LV	84%	66%	72%
HGV Nos.	69	295	365
% HGV	16%	34%	28%

Source: Independent Traffic Surveys April/ May 2012

The traffic generated by the Port of Cork varies depending on the levels of activities by customers including traffic movements related to shipping, traffic related to the activities of ancillary service providers and travel by employees. Vessel Cargo Operations at Ringaskiddy are available 24 hours 7 days a week, depending on shipping schedules, warehouse activities which normally operate from 7am to 7pm, 5.5 days per week (Monday – Saturday), all year round (note Saturday represents the 0.5 day operation).

Figures 8.12 – 8.15 are taken from the ATC counts recorded outside the Ringaskiddy Terminal, Ringaskiddy Deepwater Berth (DWB) and Tivoli entrances respectively, between the 14th and 27th of May in 2012. The numbers are based on the average weekday traffic at the sites. Figures 8.12 - 8.15 below show the average number of vehicles that use Ringaskiddy Terminal, Ringaskiddy DWB, Ringaskiddy Terminal and DWB combined and Tivoli respectively, during weekdays recorded over a two week period in May 2012. It can be seen at both locations (Ringaskiddy and Tivoli) that Port traffic is reasonably steady during the day. The traffic flows, both LV and HGV, during the commuter peak hours (08:00 – 09:00 and 17:00 – 18:00) are also indicated and discussed below.

At Ringaskiddy Terminal, the HGV flows are low, peaking at 11:00. The LV flows at the terminal are highest between 11:00 and 17:00. At Ringaskiddy DWB, HGV flows are reasonably steady throughout the day, peaking at 08:00. LV traffic peaks at 11:00, but is also relatively high in the early morning and early afternoon. At Tivoli, LV traffic peaks in the early morning, 07:00, and is also relatively high at 08:00 and 17:00. HGVs are relatively steady, peaking in the early afternoon around 15:00. Combining the Ringaskiddy Terminal and DWB, in the commuter morning peak at Ringaskiddy, there are on average 53 Port related LVs and 39 HGVs. The commuter evening peak sees an increase to 63 LVs and a decrease to 14 HGVs. The Port peak for LVs at Ringaskiddy (terminal and DWB) occurs at 11:00 with 83 vehicles. The Port peak for HGVs occurs at 08:00, 11:00 and 12:00 with 39 HGVs. The combined average daily flow at Ringaskiddy is 1,295 vehicles.

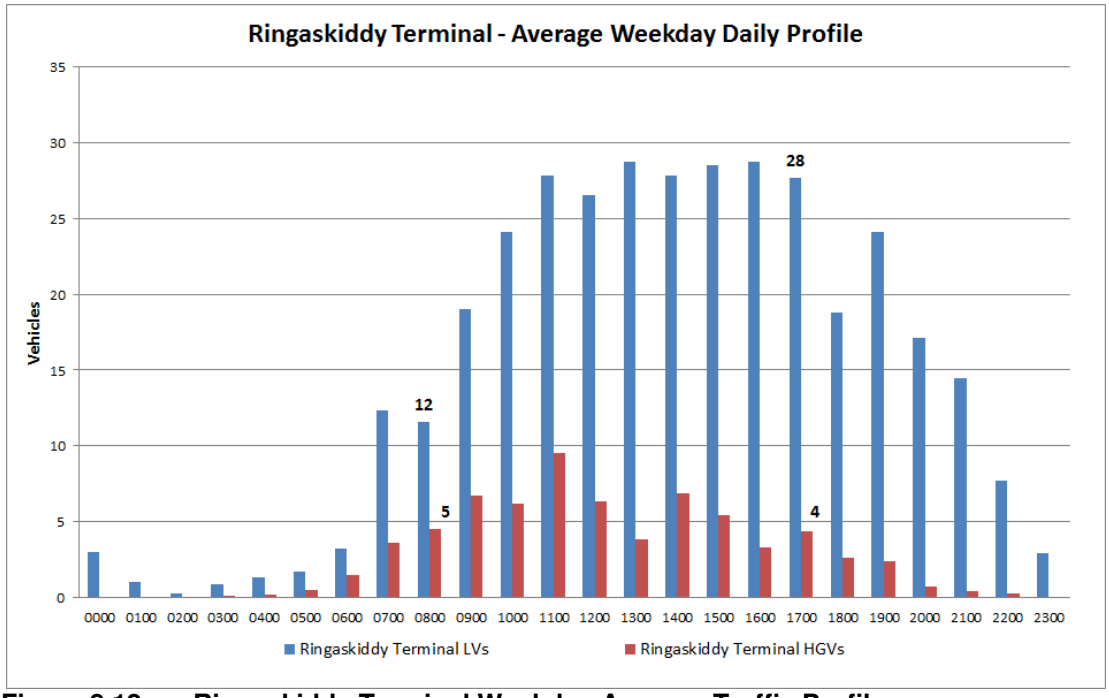


Figure 8.12: Ringaskiddy Terminal Weekday Average Traffic Profile

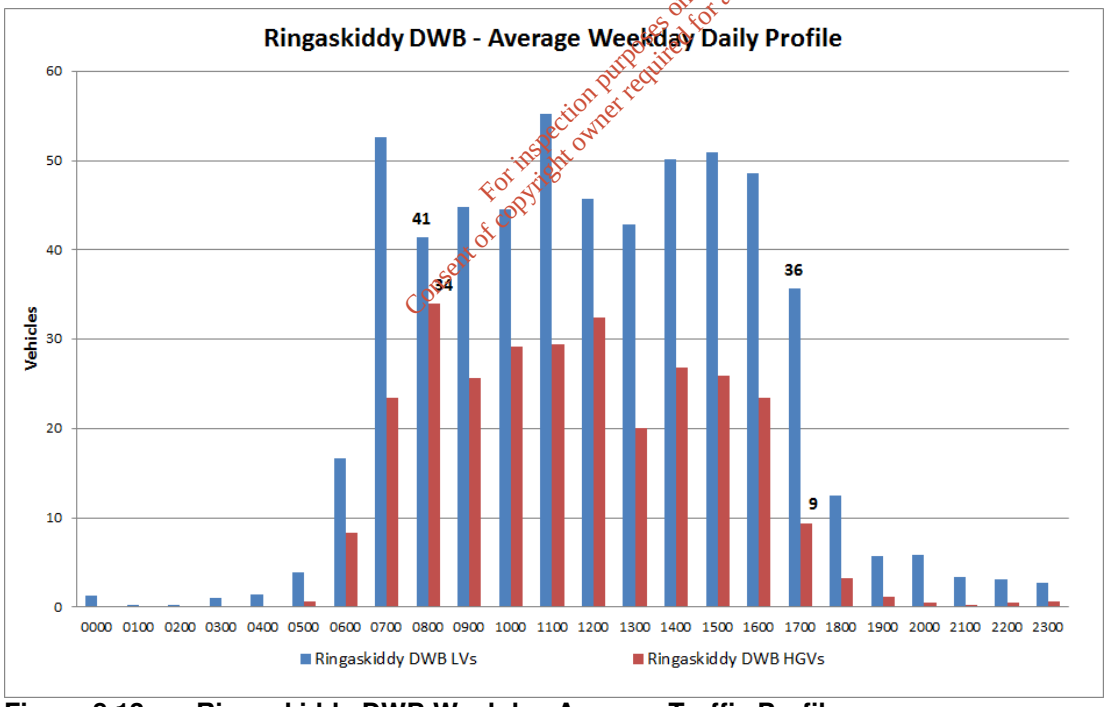


Figure 8.13: Ringaskiddy DWB Weekday Average Traffic Profile

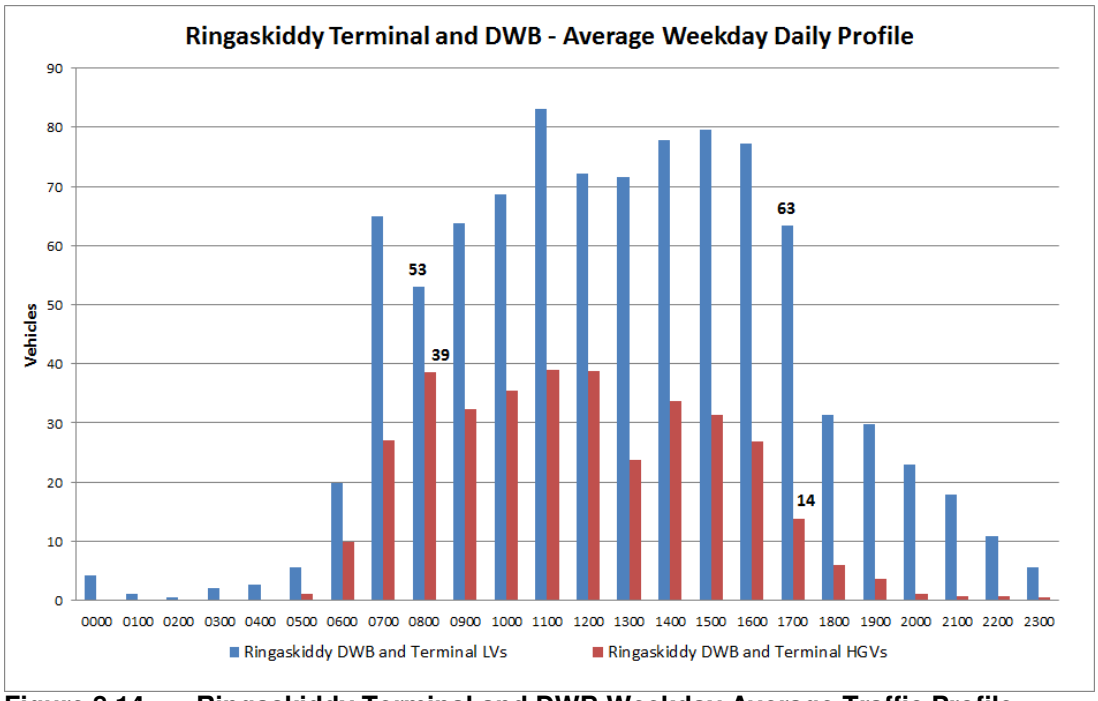


Figure 8.14: Ringaskiddy Terminal and DWB Weekday Average Traffic Profile

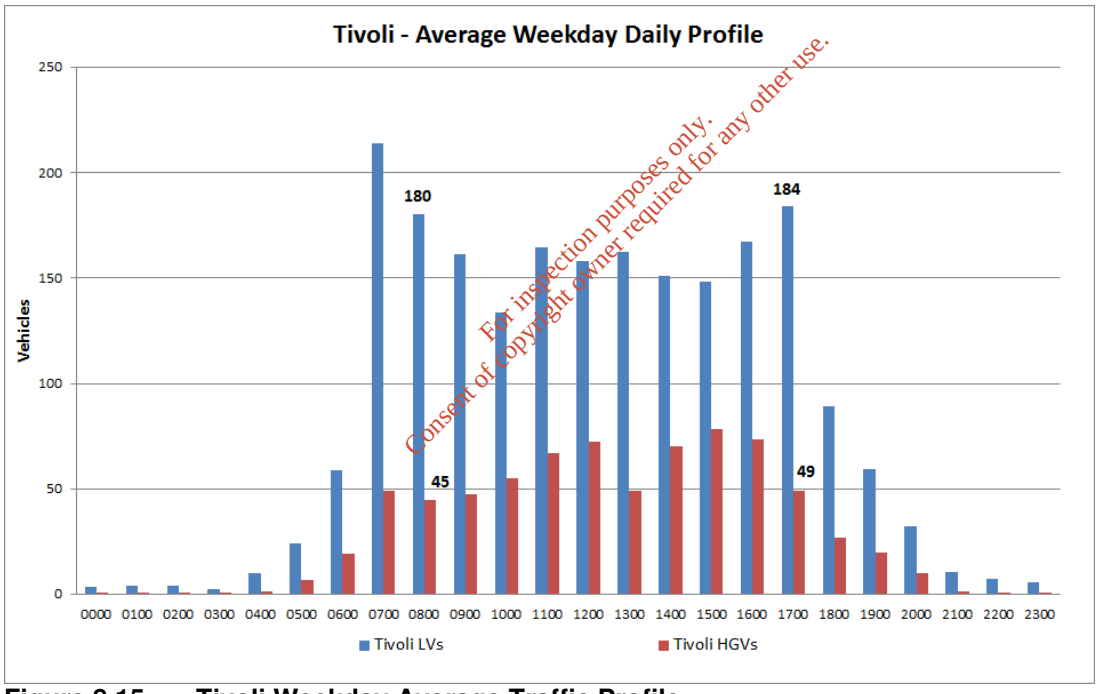


Figure 8.15: Tivoli Weekday Average Traffic Profile

Junction Turning Count (JTC) surveys were also undertaken in May 2012 for three hours in the morning (07:00 – 10:00) and three hours in the evening (16:00 – 19:00) and vehicles entering and exiting Ringaskiddy DWB, Ringaskiddy Terminal and Tivoli were recorded.

In addition Origin – Destination (O-D) surveys were undertaken at Tivoli and Ringaskiddy Ports in 2012. Table 8.5 below shows the most frequently used roads for travelling to and from the Ports of Tivoli and Ringaskiddy. These surveys indicated the route to or from the port used by Port traffic. For example, anecdotal evidence from the survey suggests that hauliers currently driving to / from Killarney avoid Macroom and instead drive via Mallow. This journey to the port has been replicated in the traffic modelling.

Table 8.5: Top Three Roads

	Top 3 busiest routes to/from the Port		
To Tivoli	N25 – 34%	N20 – 18%	N8/M8 – 17%
From Tivoli	N25 – 30%	N20 – 20%	N8/M8 – 18%
To Ringaskiddy	N8/M8 – 19%	N20 – 17%	N25 – 15%
From Ringaskiddy	M8 – 24%	N20 – 19%	N25 – 12%

8.3.5 Available Road Capacity

The survey figures show that approximately 85% of all Port HGV traffic currently operates outside of the AM and PM Peak periods i.e. between 09:00 and 17:00. In this inter-peak period there is sufficient spare capacity on the strategic road network to cater for such traffic demand because the levels of traffic during this period are significantly less than the peak period traffic levels.

Figures 8.16 to 8.19 below show the daily profiling of traffic on the N28 at Shanbally, Shannonpark, Carr's Hill junctions and on the N40 at the Jack Lynch Tunnel (using 2012 traffic data). Traffic flows at Shanbally, Shannonpark and Carr's Hill are taken from the JTC and ATC survey results. Traffic flows through the Jack Lynch Tunnel are taken from the validated base year traffic modelling (2012).

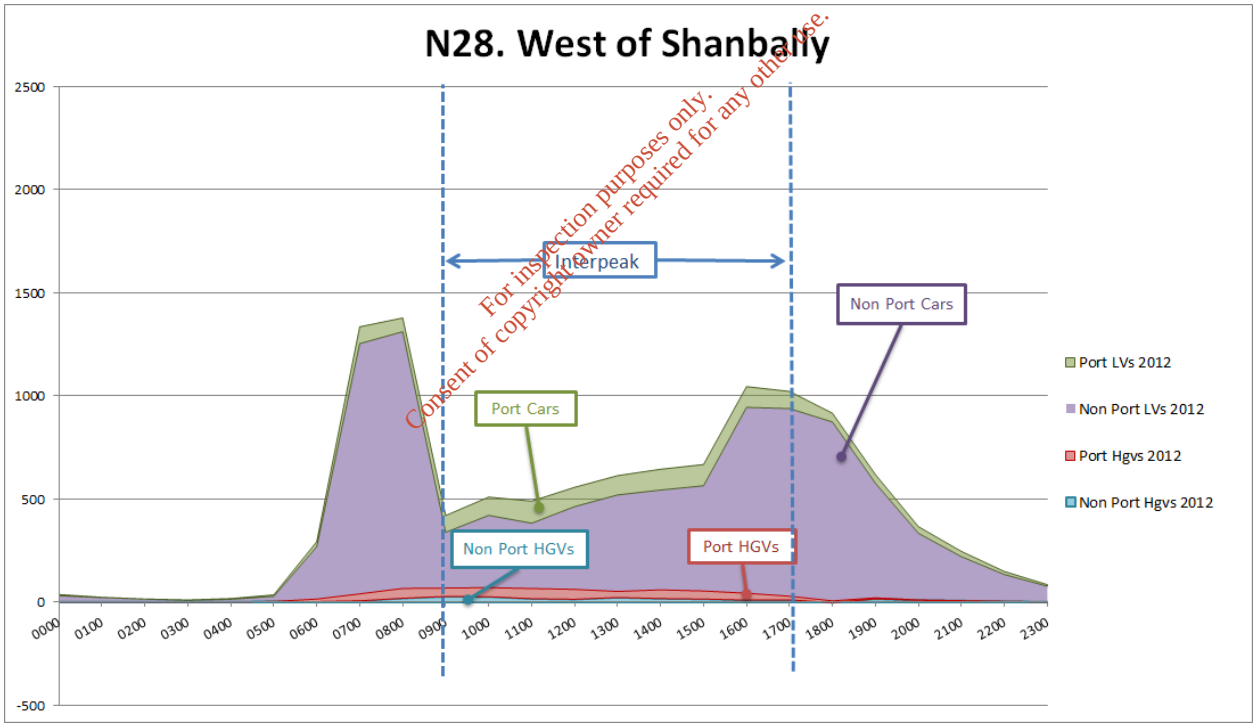


Figure 8.16: AADT Profiling West of Shanbally Roundabout

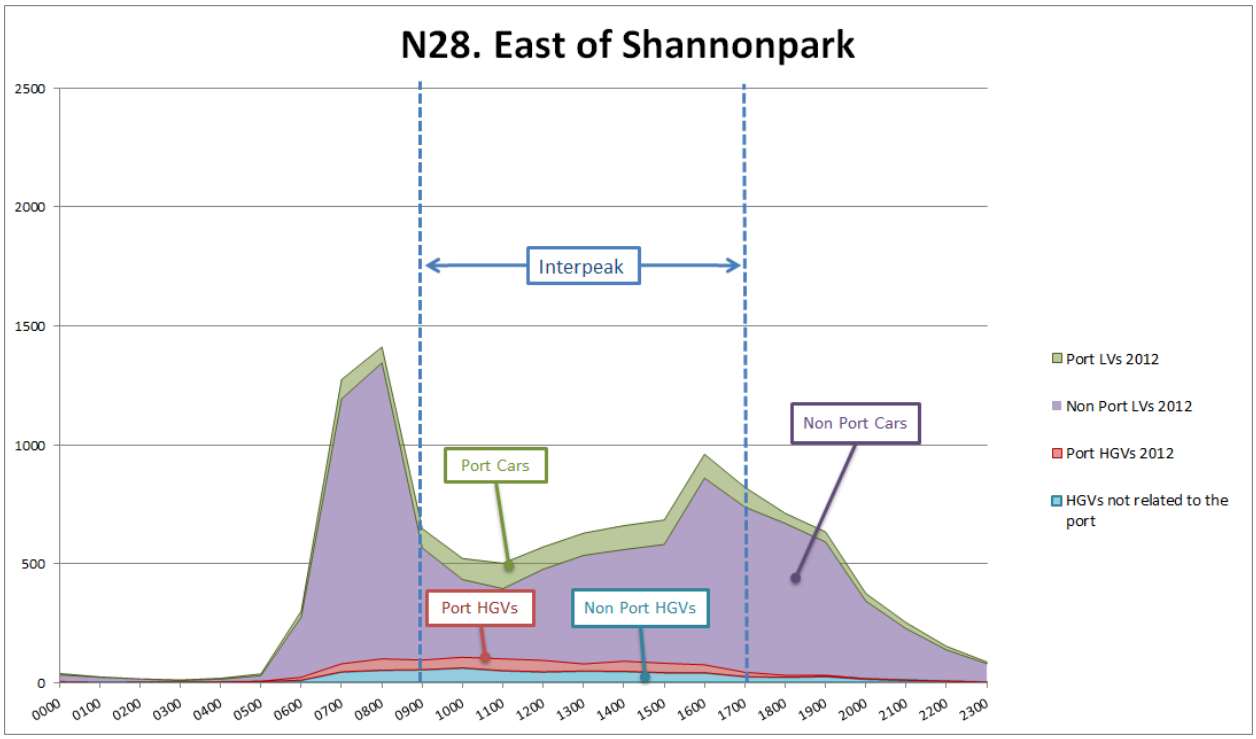


Figure 8.17: AADT Profiling N28 – East of Shannonpark

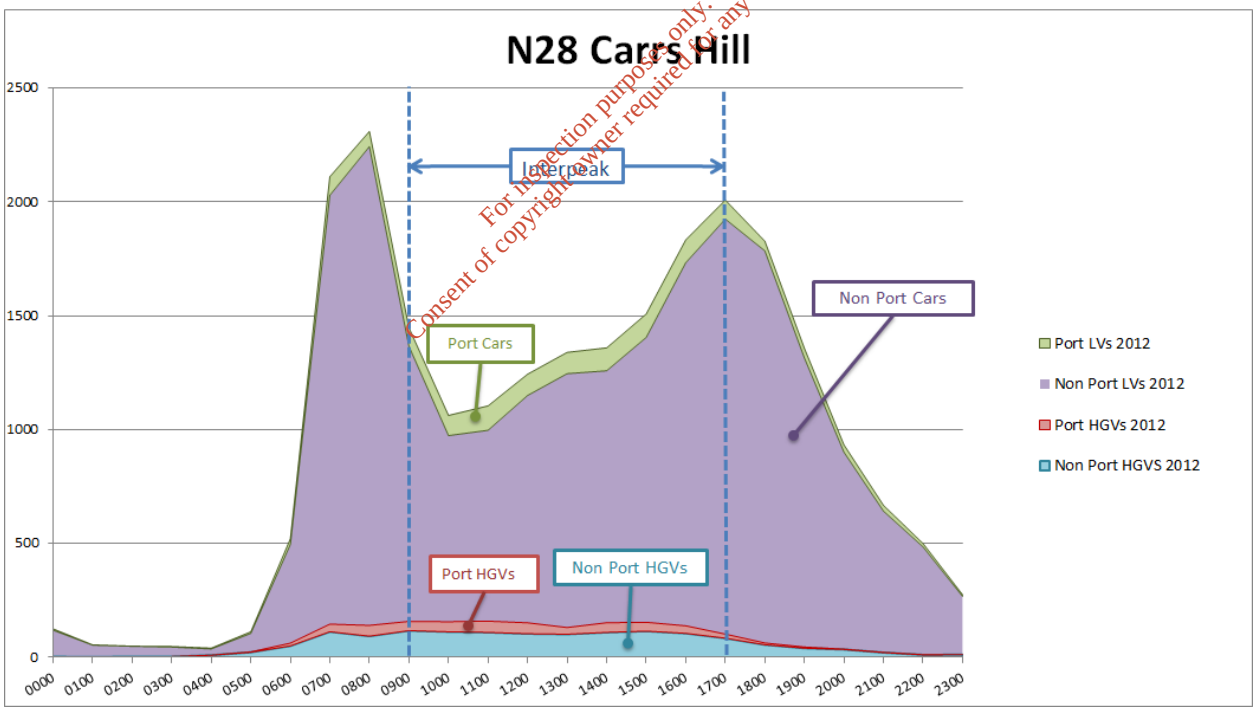


Figure 8.18: AADT Profiling N28 – Carrs Hill

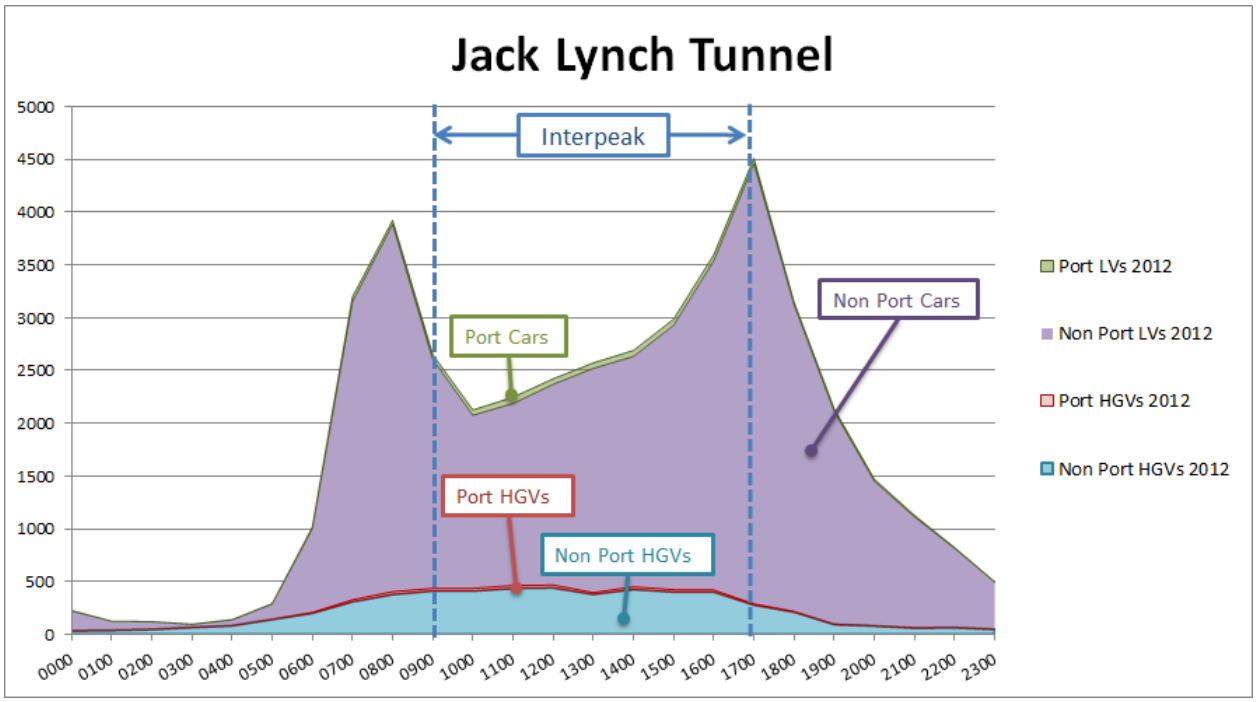


Figure 8.19: AADT Profiling Jack Lynch Tunnel

8.3.6 Inter Peak Capacity

Figures 8.16 – 8.19 show that the daily flow profile for traffic at these junctions is at its highest during the AM and PM Peaks (which occur at approximately 07.45-09.00 and 17.00-18.00 respectively). It is also evident that generally, traffic levels drop significantly during the Inter-Peak period between the hours of 09.00-17.00 and that Port activity is at its highest during this Inter Peak period. As mentioned previously, over 85% of traffic generated by the Port operates outside the AM and PM peaks.

These figures clearly show that there is significant spare capacity on these roads outside of the peak periods (i.e. particularly in the Inter Peak period between the AM and PM commuter peaks) to accommodate additional traffic.

It is also worth noting that Port generated traffic represents a small proportion of overall traffic operating on the N28 and N40 at Shanbally, Shannonpark, Carr's Hill and the Jack Lynch Tunnel respectively.

8.3.7 Existing Public Transport Facilities

8.3.7.1 Bus Services

At present, the Ringaskiddy area is served by one Bus Éireann (BÉ) Regional Route (223 – Cork-Monkstown-Ringaskiddy-Haulbowline). During the morning peak (07:45–09:00) there are three services southbound and five services northbound on this route. The bus route varies throughout the day. For example, some buses turn right at Shanbally and continue to Ringaskiddy along Church Road, whereas, at other times, some buses stay on the N28 past Pfizer and continue into Ringaskiddy. There are no direct bus services between Ringaskiddy and Carrigaline or Ringaskiddy and Douglas.

There are few dedicated bus stops along the N28, except at Ringaskiddy and Shanbally villages. Ringaskiddy has two bus stops, located at both ends of the village. The bus stops in Shanbally are located close to the village centre, school, church and other points of interest. There are also bus stops in Carrigaline village which are served by the BÉ 222 regional route.

There is a relatively low amount of public transport use in Ringaskiddy, with 6% of Ringaskiddy residents travelling to work and education by bus when compared to Cork City (10%), Cork County (9%) and state averages (16%).

8.3.7.2 Rail Services

Kent Station is located within walking distance of Cork City Centre. It serves the Cork-Dublin Heuston, Cork-Tralee and Mallow-Cork-Cobh/ Midleton lines. There are regular commuter services between Cork and Midleton/ Cobh (alternative services every 15 minutes – less regular outside peaks). Of these services, approximately one an hour originates in Mallow. There is a regular hourly service between Cork and Dublin and eight services a day facilitate travel between Cork and Tralee.

Ringaskiddy village or Ringaskiddy Port is not serviced by rail. There is a local ferry service, described below, which connects Glenbrook, located between Passage west and Monkstown, and Carrigaloe (on the Cobh line) 5km north west of Cobh. As mentioned there is a bus connection between Monkstown and Ringaskiddy which is a very limited and infrequent service.

8.3.7.3 Ferry Services

There is a cross river ferry linking Glenbrook located between Passage West and Monkstown and Carrigaloe on Great Island 3.5 km north of Cobh and adjacent to the Cork Cobh railway station. This ferry facilitates travel between Ringaskiddy and Cobh, without the need to travel via Dunkettle Interchange, Jack Lynch Tunnel, and the N25 etc. The crossing from Glenbrook to Carrigaloe takes four minutes. The ferries run daily between 07:00 and 22:00 and reservations are not required. The distance between Ringaskiddy and Glenbrook is approximately 9km and Carrigaloe to Cobh is approximately 3.5km.

In addition to the cross river ferry there is a ferry service which currently operates at Ringaskiddy with one service per week (Saturdays) between Ringaskiddy and Roscoff in France.

8.3.8 Existing Pedestrian & Cycling Facilities

In general, pedestrian and cycling facilities (such as footpaths, cycleways adequate crossing points, etc.) are very limited in Ringaskiddy and likely play a large part in influencing the low levels of pedestrian activity.

Pedestrian facilities are generally poor along the N28 and very low levels of pedestrian activity were observed during the site visits. Parts of the N28 have footpaths and crossing points, notably between Shanbally village and Ringaskiddy village, however there are no facilities for pedestrians or cyclists in any other areas along the N28 route.

The existing N28 road network represents a poor cycling environment, and very little cycle activity was observed within the study area, and particularly along the N28.

8.4 Future Environment

8.4.1 Proposed New Road Infrastructure

8.4.1.1 Dunkettle Interchange Upgrade

The Dunkettle Interchange comprises the junction of the N8, the N25 and the Jack Lynch Tunnel (N40) and currently suffers from significant congestion leading to delays and queuing during peak trafficked periods. The current Dunkettle interchange arrangement at the northern Tunnel portal has free flow for the traffic going in an east - west direction along the N25 but north - south traffic (N8/ N40) and the predominant (right) turning traffic (N40/ N25) are forced to negotiate an at grade traffic signal controlled roundabout.

It is proposed to upgrade the Dunkettle interchange to achieve full free flow for these key movements and to include measures to remove locally generated traffic from the interchange. In April 2013, ABP approved the Dunkettle Interchange Improvement Motorway Scheme and the proposed facility is currently at notice to treat stage. For the purpose of this assessment, the Dunkettle Interchange is expected to be delivered by 2020 and is included in the future year traffic modelling assessment on this basis.

8.4.1.2 N28 Upgrade

The N28 is the National Primary Road which links the N40 South Ring Road to Ringaskiddy. It is proposed to improve the existing N28, between the Bloomfield Interchange and Ringaskiddy village, upgrading it to a motorway/ dual carriageway. For the purposes of this traffic assessment, the N28 Upgrade is not expected to be delivered before 2023.

The main objectives of the N28 Upgrade scheme are to provide priority access and increased capacity between the Port and other major employers at Ringaskiddy and the National Road Network and to bypass the villages of Shanbally and Ringaskiddy. The upgrade will provide for a safer National Road Network and improve national route access to the Ringaskiddy Strategic Employment Centre (as designated in the Cork County Development Plan) supporting the development of IDA owned lands in this nationally strategic manufacturing location which is currently zoned for development thereby facilitating economic growth. The need for the N28 Upgrade has been highlighted in numerous national studies including the National Development Plan (2007-2013).

Currently Cork County Council is exploring different options regarding this upgrade. Consultants have been appointed to prepare an Environmental Impact Statement (EIS) and bring the scheme through the statutory consent processes in late 2014. One option for the proposed route is that the N28 Upgrade would terminate east of Ringaskiddy village whereas another option is that the N28 Upgrade terminates at the R613, re-joining the existing N28 west of Ringaskiddy village. Figure 8.20 illustrates a potential route for the N28 Upgrade, following an offline section of road between east of Ringaskiddy village and north of Shannonpark Roundabout. At the time of writing this Chapter, the proposed N28 Upgrade route has not been finalised and accordingly Figure 8.20 only represents an indicative layout.

For the basis of this Chapter, it has been assumed that the N28 upgrade is constructed to a high quality road standard, providing a carriageway of two lanes each way. It has also been assumed that the full option is constructed, i.e. ending east of Ringaskiddy village as shown in Figure 8.20. The shorter option, i.e. terminating at the R613, is considered by way of a sensitivity test in the traffic model enabling the assessment of the impact of the proposed redevelopment at Ringaskiddy in either case.

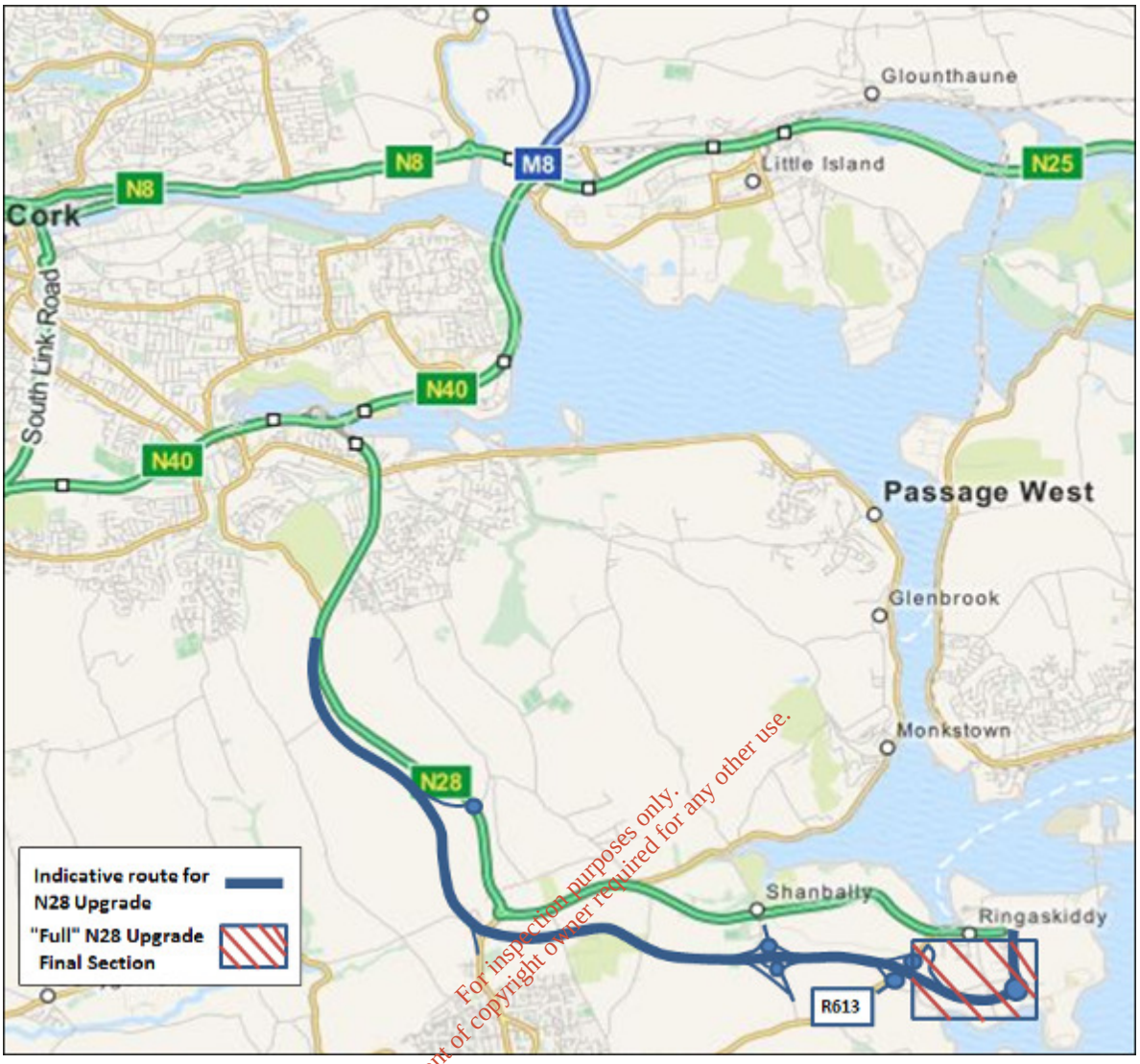


Figure 8.20: Indicative N28 Upgrade

8.4.1.3 N40 Demand Management Study

The N40 Cork Southern Ring Road comprises approximately 14km of dual carriageway road skirting the southern boundary of Cork City between the Dunkettle Interchange to the east (junction with the M8, N8 and N25) and the Poulavone Interchange to the west (junction with N22). Currently the N40 route serves a dual function. Firstly it is a strategic route, part of the core trans-European network and provides linkage between strategic national routes (M8, N8, N25, N28, N27, N71 & N22). The second function is as a key local distribution route, facilitating local access to areas of the southern part of Cork City and environs (Mahon, Douglas, Carrigaline, Wilton, Ballincollig, etc.) as well as providing a relief road for local traffic crossing the city and wishing to avoid travelling through Cork City Centre.

The N40 is currently heavily trafficked during peak periods. The recent ABP approval of the Dunkettle Interchange Improvement Motorway Scheme 2012 (Ref. PL04.MA0011) included conditions in relation to the monitoring and modelling of the impact of traffic growth on the operation of the N40 and the Jack Lynch Tunnel. In response to the ABP findings the NRA are currently undertaking the N40 Demand Management Study to identify options to manage the impact of further traffic growth on the N40. The purpose of the exercise is to examine traffic flows and potential interventions on the N40 to try and safeguard the capacity along the N40 and reduce levels of congestion for the future, as demand for travel rises. It is worth noting that the function of the N40, as a national road, as defined in 'Spatial Planning and National Roads' is to provide strategic transport links between the main centres of population and employment, including key international gateways such as the main ports

and airports, and to provide access between all regions. The N40 Demand Management Study is due for completion in July 2014.

The demand management options being considered could include ramp metering, use of speed limits, tolling, among others. The anticipated benefits/ improvements of such measures will be determined as part of the N40 Demand Management Study. It is not yet known when the N40 Demand Management Study measures would be implemented, or indeed what measures would be included. Therefore, in terms of assessing and modelling the traffic impact of proposed Ringaskiddy Port Redevelopment, the N40 Demand Management Study measures have not been assumed in our traffic modelling and this approach represents the worst case scenario for traffic impact on the N40 since the benefits of these measures are not taken into account.

8.4.1.4 Future Traffic Access at Ringaskiddy Port

The proposed Ringaskiddy Port Redevelopment includes improvements to access and circulation at Ringaskiddy Port as follows:

- Improvements to the external road entrance into Ringaskiddy West
- The incorporation of an alternative means of access to Ringaskiddy East which would link directly to the N28 Upgrade
- Improvement works to the road network within the existing Port of Cork lands at Ringaskiddy East to facilitate the internal circulation of port traffic and ensure that queuing does not extend onto the N28

Further details of the proposed road layout are provided in Chapter 3 - Project Description of this EIS.

8.4.2 Future Public Transport

There are plans to introduce a new bus service between Ringaskiddy and Ballincollig in the near future. This service, illustrated in Figure 8.21 below, would be run at regular intervals and travel via Carrigaline, Douglas and the City Centre, which would greatly improve the public transport offering to those travelling to Ringaskiddy Port from Carrigaline, Douglas and Cork City.

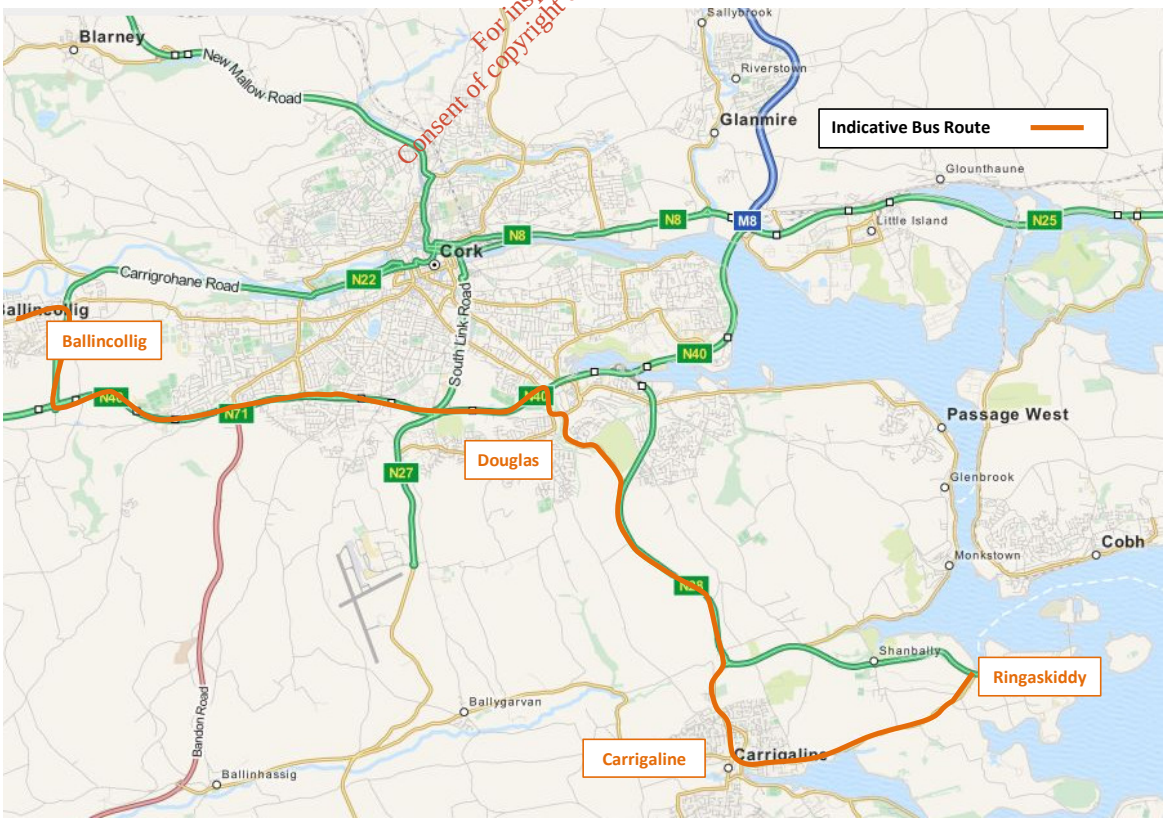


Figure 8.21: Indicative Bus Route

8.4.3 Future Walking & Cycling

Provision for pedestrians and cyclists will significantly improve in Ringaskiddy under the Cork County Development Plan, whereby an off-road cycle route is proposed linking Cork - Passage West – Carrigaline - Ringaskiddy. It is proposed to extend the existing cycleway which terminates at Passage West to Monkstown and the N28 east of Shannonpark Roundabout and onwards to Ringaskiddy to the east and to Carrigaline to the south. This extended facility is a key component of the N28 STS.

This will greatly improve the attractiveness of walking and cycling for commuters to Ringaskiddy Port, in particular those who live in Carrigaline and environs, which is 5.5km from Ringaskiddy. Currently 7% of Port of Cork employees (who were surveyed in 2012) live in Carrigaline.

It is proposed to signalise the new access road to Ringaskiddy West. These proposed signalised junctions will facilitate safer crossing points for pedestrians and cyclists in Ringaskiddy village. The proposed signals at these junctions will also be in keeping with the proposed N28 STS programme being currently prepared by Cork County Council which proposes to develop the existing N28 as a 'green corridor' following the opening of the N28 upgrade. Figure 8.22 below illustrates the proposed green corridor between Passage West and Carrigaline.

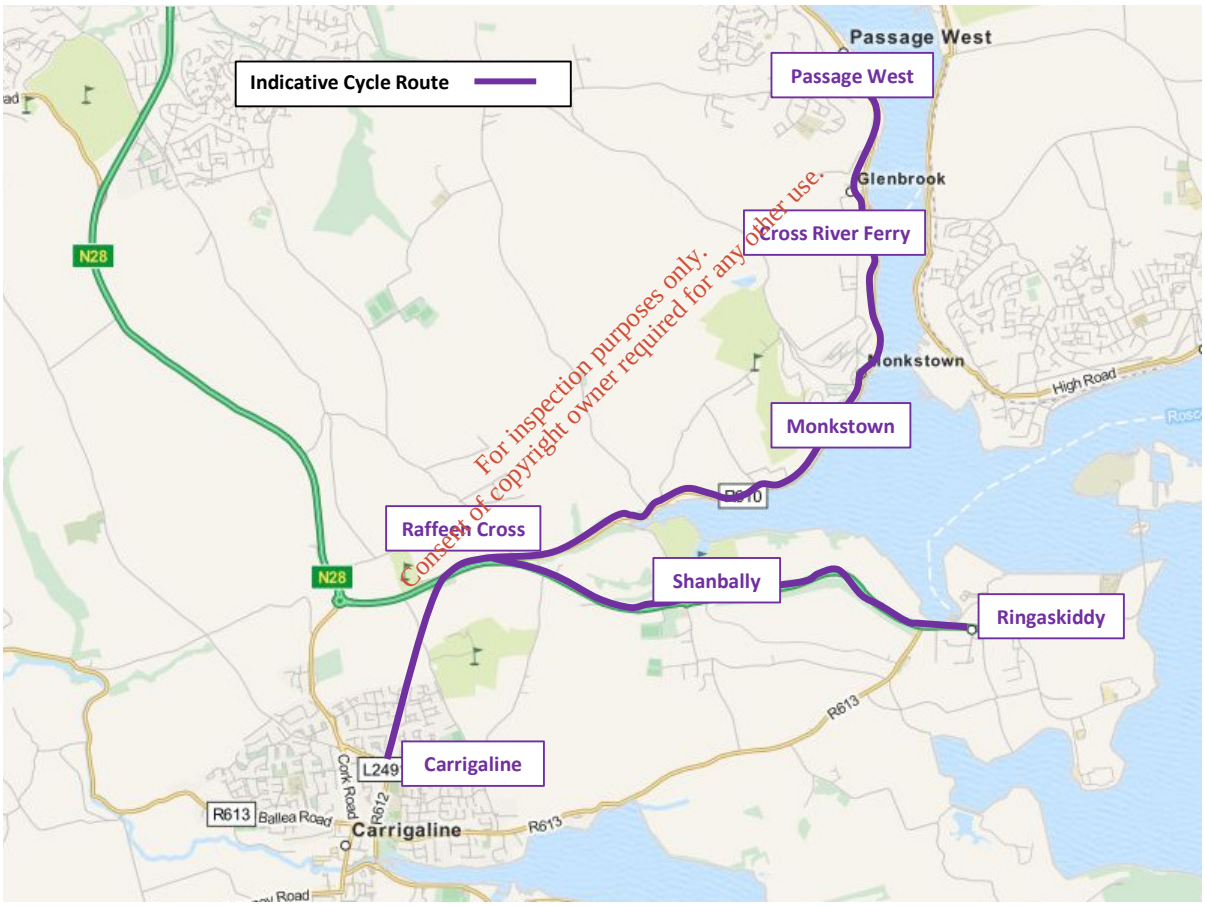


Figure 8.22: Proposed Walking & Cycling Route

8.4.4 Relocation of City Quays and Tivoli Ports

The proposed redevelopment at Ringaskiddy is intended to facilitate and accommodate a transfer of Port operations over time from the existing Tivoli and City Quays sites. These sites (Tivoli and City Quays) are ultimately to be redeveloped as part of the "Cork City Harbour" initiative and contribute to the sustainable development of the City.

8.4.5 Ringaskiddy Trip Generation

The future traffic generated by the proposed Ringaskiddy Port Redevelopment was calculated by converting the projected level of development for Phase 1, 2 and 3 above into HGVs and LVs per hour over a typical day. Traffic generation and distribution is detailed further in Appendix 8.7 (refer to EIS Volume III b).

Tables 8.6 to 8.8 show AM Peak, PM Peak and daily traffic generation figures for the proposed redevelopment for 2018 and 2033 respectively. Also shown in the tables are the Do Minimum (i.e. without the proposed redevelopment) traffic generation figures. Further details are provided in Appendix 8.7 (refer to EIS Volume III b).

Table 8.6: Ringaskiddy Traffic Generation 2018 for AM and PM Peaks

	HGVs		LVs		HGVs		LVs	
	2018 Peak IN AM	2018 Peak OUT AM	2018 Peak IN AM	2018 Peak OUT AM	2018 Peak IN PM	2018 Peak OUT PM	2018 Peak IN PM	2018 Peak OUT PM
Do Minimum	***37***	***40***	***65***	***20***	***22***	***30***	***23***	***56***
Phase 1	12	12	41	2	12	15	2	41
Phase 2	9	11	41	1	2	4	2	41
Phase 3	0	0	0	0	0	0	0	0
Total	59	63	147	23	36	49	27	138

Table 8.7: Ringaskiddy Traffic Generation 2033 for AM and PM Peaks

	HGVs		LVs		HGVs		LVs	
	2033 Peak IN AM	2033 Peak OUT AM	2033 Peak IN AM	2033 Peak OUT AM	2033 Peak IN PM	2033 Peak OUT PM	2033 Peak IN PM	2033 Peak OUT PM
Do Minimum	***36***	***39***	***65***	***20***	***21***	***20***	***23***	***56***
Phase 1	48	48	41	1	47	58	2	40
Phase 2	30	34	41	1	6	12	2	40
Phase 3	246	15	0	0	15	258	0	0
Total	360	137	146	23	88	348	27	137

Table 8.8: Ringaskiddy Daily Traffic Generation Figures for 2018 & 2033

	2018			2033	
	HGV	**LV**		**HGV**	**LV**
Do Minimum	*962*	*1101*	*Do Minimum*	938	*1101*
Phase 1	414	92	**Phase 1**	1595	92
Phase 2	177	92	**Phase 2**	553	92
Phase 3	0	0	**Phase 3**	738	0
Total	1552	1285	**Total**	3824	1285

8.5 Assessment of the Port Redevelopment Using the Traffic Model

8.5.1 Background Traffic Growth Forecasts

The traffic forecasts for the Port of Cork Strategic Traffic Model (PoCSTM) were developed in accordance with the NRA Project Appraisal Guidelines (PAG) Unit 5.4, and use growth forecasts from the National Traffic Model (NTM). This approach is consistent with the approach used to build the Dunkettle Traffic Model and therefore considered appropriate. The NTM forecasts are based on updated national government population projections and also take account of national transport policies. Traffic growth forecasts are calculated in the NTM taking account of population growth forecasts, economic growth forecasts and forecast rates of car ownership. Uncertainty is allowed for in the production of three forecasts since they include three growth scenarios comprising low growth, medium growth and high growth. It should be noted that it is a requirement of the PAG that local model forecasts are constrained to the overall levels of growth contained in the NTM forecasts. Further detail is provided in Appendix 8.6 (refer to EIS Volume III b).

8.5.2 Assessment Years

In addition to the base year (2012), two assessment years were modelled, these were 2018 and 2033. 2018 was chosen as the most likely first year of the operation of the proposed redevelopment. As per NRA Traffic and Transport Guidelines, the development must also be assessed for a future year of 15 years after the first year of operation, and therefore 2033 is chosen on this basis. An intermediate year of 2023 was also modelled to represent a 5 year of operation scenario for sensitivity testing purposes (as recommended in the NRA Traffic & Transportation Guidelines) and which is described in more detail later in this Chapter.

For each of the modelled years, the highway network included in the traffic model reflects the projected infrastructure improvements scheduled to be in place at that particular stage. For example, the N28 upgrade and the upgrade to Dunkettle Interchange are expected to be in place by 2033 and so are included in the 2033 model scenario whereas in 2018 they are not expected to be in place and so are omitted from the 2018 model. The level of background traffic growth for the two future years tested (i.e. 2018 and 2033) was based on growth forecasts from the NRA's National Traffic Model (NTM), as referred to in section 8.5.1 above, but specifically from the *medium growth* scenario range.

The extent of the proposed redevelopment traffic to and from the Ringaskiddy Port was calculated using the detailed trip generation process described previously in section 8.4.5. This is based on existing levels of cargo throughput at each of the Port of Cork sites and future forecasts of cargo growth (Please refer to Appendix 2.1 - EIS Volume III a (Indecon Report) for a detailed discussion on growth forecasts). The corresponding traffic distribution onto the road network is based on the existing distribution to / from the Port sites.

Two business as usual scenarios (i.e. 'no development') entitled Do Minimum 2018 and Do Minimum 2033 are used to represent the base situation against which other scenarios are compared. In these cases, the only change in development traffic relates to background traffic growth (increases) and diversion of trade to other ports (reductions). This comparison demonstrates the impact of the proposed Ringaskiddy Port Redevelopment, when compared to a scenario without the proposed redevelopment in place. The two 'development' scenarios are entitled Do Something 2018 and Do Something 2033.

8.5.3 Core Scenarios Tested

A base and four 'core' scenarios were assessed using the PoCSTM to determine the traffic impacts of the proposed redevelopment, and these are as follows:

- Scenario 1 is calibrated and validated based on the 2012 base year model representing the existing road network and travel demand
- Scenario 2 includes the existing road network, the forecast background traffic growth projected for 2018, a minimum level of cargo activity related to the existing Ringaskiddy Port and 2018 projected activity at Port of Cork sites at Tivoli and City Quays (i.e. 2018 'Do Minimum'). The purpose of this scenario is to analyse the impacts of the minimum

development at Port of Cork on the existing road network with 2018 travel demand and 2018 projected Port trade without Ringaskiddy Redevelopment.

- Scenario 3 involves testing the existing road network, using the 2018 background traffic growth but with full redevelopment of the Port at Ringaskiddy for 2018 (2018 'Do Something'). The purpose of this scenario is to analyse the impacts of the full redevelopment of Ringaskiddy Port on the existing road network with 2018 travel demand and Port trade
- Scenario 4 includes the assumed 2033 road network (i.e. the full N28 Upgrade and Dunkettle Interchange upgrade in place), 2033 forecast background traffic growth with a minimum level of redevelopment for 2033 at the Port of Cork sites (2033 'Do Minimum). The purpose of this scenario is to analyse the impacts of the minimum redevelopment at Port of Cork (incl. existing Ringaskiddy Port) on the 2033 road network with 2033 travel demand
- Scenario 5 involves testing the assumed 2033 road network (with the full N28 Upgrade and Dunkettle Interchange upgrade in place), 2033 forecast background traffic growth with full redevelopment for 2033 of the Port at Ringaskiddy (2033 'Do Something'). The purpose of this scenario is to analyse the impacts of the full redevelopment of Ringaskiddy on the 2033 road network with 2033 travel demand and projected Port trade. The infrastructure and development phasing assumptions that are made for each of these scenarios are as follows:

Infrastructure included in the traffic modelling scenarios:

- In the 2018 scenarios it is assumed that there are no changes to the existing infrastructure
- However, in the 2033 scenarios it is assumed that the Dunkettle Interchange is upgraded and that the full N28 Upgrade is in place to east of Ringaskiddy village

Development included in the traffic modelling scenarios:

- For the business as usual 'Do Minimum' scenarios Ringaskiddy Port and the other port sites at Tivoli and City Quays will remain largely similar to today, with some reduction in activity over time due to trade diverting to other ports as Port of Cork becomes less competitive because of its inability to accommodate the larger more efficient and lower cargo cost vessels.

- For the 'Do Something' scenarios the following development phasing is assumed as part of the Ringaskiddy Port redevelopment:

  - Phase 1 development – an increase in LoLo, General Cargo and Trade Cars
  - Phase 2 development – an increase in Bulk operations
  - Phase 3 development – an increase in RoRo operations

Phase 3, the new RoRo facility, will not be operational until after the N28 Upgrade is in place (which is assumed to be 2023. Note that 2023 scenario sensitivity assessments are presented later in section 8.7.5 which evaluates the benefit of the N28 Upgrade). The base year and four 'core' scenario tests and infrastructure / development assumptions are tabulated in Table 8.9.

Table 8.9 Core Scenarios Tested through the PoCSTM Traffic Model

					Infrastructure			Development			
									Do Something		
No.	Description	Year	Time Period	Background Growth	N28 Existing	Dunkettle Upgrade	N28 Upgrade	DoMin	Phase1 - LoLo & Trade Cars	Phase2 - Bulk	Phase3 - RoRo
1	Base	2012	AM / PM	None	✓	×	×	Existing	×	×	×
2	2018_Do Min	2018	AM/PM	2018 NRA Medium Growth	✓	×	×	✓	×	×	×
3	2018_Do Something	2018	AM/PM	2018 NRA Medium Growth	✓	×	×	×	✓	✓	×
4	2033_Do Min	2033	AM/PM	2033 NRA Medium Growth	✓	✓	✓	✓	×	×	×
5	2033_Do Something	2033	AM/PM	2033 NRA Medium Growth	✓	✓	✓	×	✓	✓	✓

8.6 Traffic Impact Assessment

8.6.1 Identification and Scale of Impacts

The impact assessment process introduced in section 8.2.3 is used to identify and measure traffic impacts generated by the proposed redevelopment. 'Do Minimum' scenarios, i.e. without the proposed redevelopment, will be compared to 'Do Something' scenarios, i.e. with the proposed redevelopment in place. Construction impacts associated with constructing the development etc. will also be assessed.

The 'Do Minimum' and 'Do Something' scenarios are compared for the same year, i.e. 2018 or 2033, and therefore the same infrastructure is assumed for the scenarios which are being compared. For example, in 2018 it is assumed that existing infrastructure is included for both the Do Minimum and Do Something scenarios and in 2033 it is also assumed that the N28 Upgrade and the upgrade to Dunkettle Interchange are in place for both the Do Minimum and Do Something scenarios.

The key primary roads within this study area on which the traffic impacts of the redevelopment are being assessed are the N28 (linking Ringaskiddy to Cork City), N40 (South Ring Road) and N8 (Cork to Dublin Road). These are National Primary Routes, which are defined as roads that connect the main centres of urban population and also connect these centres to ports and airports. These roads are considered as arterial routes which may be motorways, dual carriageways or simply wide two-way roads. Other roads, including secondary and local roads, are also assessed to determine the traffic impacts of the proposed developments.

Strategic impacts usually arise from cumulative local impacts. Furthermore strategic impacts are experienced over relatively long distances along the road Network. They are, therefore, generally only relevant for particular modes of transport, such as cars and HGVs. Local impacts are related to the local amenity of an area.

To recap, and as discussed previously in section 8.2.3, three Key Performance Indicators (KPI) have been identified which will assist in the assessment and evaluation process which will determine the traffic impact of the proposed Ringaskiddy redevelopment on these roads during peak hours. The three KPIs are**:**

- **Journey times on key routes** – to understand strategic impacts
- **Traffic Diversion Factor** – displacement of traffic elsewhere on the network to avoid congestion
- **Volume over Capacity (ratio) at Key Junctions** – to understand local impacts congestion and queues.

Using these KPIs, the traffic impacts of the proposed redevelopment will be assessed at both a strategic and local level.

8.6.1.1 Journey Times on Key Routes

To develop an understanding of the potential impact of the proposed redevelopment on key routes serving Ringaskiddy which will carry Port traffic, the projected change in vehicular journey times will be assessed. Journey times represent a very good basis for strategic traffic impact assessment as they provide a mechanism to quantify the traffic impact along a full route. This KPI will be based on a comparison between the 'Do Minimum' journey times (i.e. without the development) and the 'Do Something' journey times (i.e. with the development) in each of the scenarios to be tested. The routes considered include the N28, the N40 and the N8 (as these are the routes which will be used by Port traffic). The journey time routes used for the assessment of impact are shown in Figure 8.23. This KPI, therefore, assesses the strategic traffic impact of the proposed redevelopment.

The routes shown in Figure 8.23 are:

- Orange: N28/ N28 Upgrade/ N40 between Ringaskiddy and Kinsale Road Roundabout
- Red: N28/ N28 Upgrade/ N40 between Ringaskiddy and Dunkettle Interchange

Journey times between specific locations on key routes were extracted from the PoCSTM and these journey times will be compared for the scenario without the development and the scenario with the development in place (i.e. 'Do Minimum' scenarios will be compared to 'Do Something' scenarios). Both the percentage change and absolute change in journey times (seconds) is considered in order to determine the impact, as shown in Table 8.10 below.

The impact scale used for journey times has been developed using the latest Census travel statistics for Cork and locally based traffic survey information. These CSO Census statistics state that the average journey time for those travelling to work in Cork City and Suburbs in the 2011 census was 21 minutes and only 11.3% of workers faced a commuting time in excess of 30 minutes. The average journey times recorded (during peak times – AM and PM) in May 2012 were 10 - 15 minutes along the N28 (from Bloomfield Interchange to Ringaskiddy), approximately 20 minutes along the N40 and the N8/ North Ring Road (between Bloomfield and where the North Ring Road meets the N20 at Blackpool, via the Dunkettle Interchange and Tivoli junction).

Table 8.10: Impact on Vehicle Journey Times on Key Routes

		Absolute Difference (seconds)			
		<60	60-120	120-240	>240
% Change	<5%	Negligible	Negligible	Minor	Moderate
	5-10%	Negligible	Minor	Moderate	Moderate
	10-20%	Minor	Minor	Moderate	Major
	>20%	Minor	Moderate	Major	Major

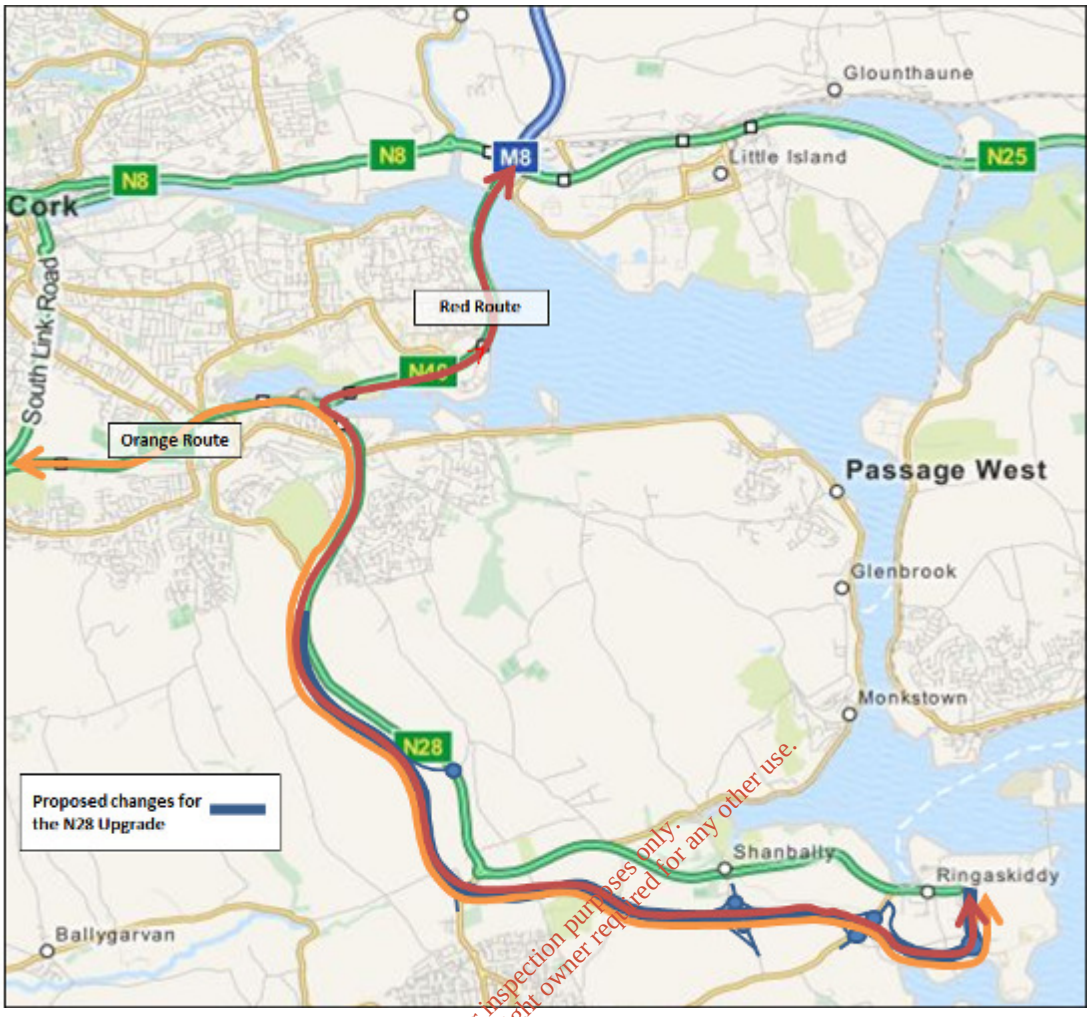


Figure 8.23: Journey Time Comparison

Table 8.10 can be interpreted as follows - the impact will be considered major if the change in journey time, when comparing the 'Do Minimum' and 'Do Something' scenarios, is greater than 240 seconds and the percentage change is greater than 10% or the time increase is between 120 – 240 seconds and percentage change greater than 20%.

In situations where the journey times decrease, i.e. the change in journeys time when comparing the 'Do Minimum' to the 'Do Something' scenarios is negative; the impact will be described as 'Positive'.

The results from this analysis are presented in section 8.6.3.1.

8.6.1.2 Traffic Diversion Factor

To further quantify the impact of the proposed redevelopment on the strategic road network the traffic diversion factor will be assessed. All Port related HGV traffic must use the N28, however background traffic is free to reroute away from the N28 onto the adjoining local road network to avoid congestion that already exists in the Do Minimum Scenario (at Shannonpark Roundabout and Shanbally Roundabout for example). This KPI therefore presents an indication of the level of traffic impact that may re-route away from already congested areas of the network due to increases in traffic generated by the proposed redevelopment at Ringaskiddy.

Vehicle numbers diverting away from the N28 were extracted from the PoCSTM traffic model and the quantum of diverting vehicles will be compared for the scenario without the development and the scenario with the development in place (i.e. 'Do Minimum' scenarios will be compared to 'Do Something' scenarios).

For this criterion, the KPI is not comparative but is absolute, i.e. there is traffic diversion or there is not. The volume of traffic diversion will be provided in terms of the number of vehicles and is presented at section 8.6.3.2.

8.6.1.3 Flow over Capacity (ratio) at Key Junctions

To further understand the potential impact on junction operations of the proposed redevelopment, the ratio of flow (of traffic) over capacity (RFC) at key junctions along the N28 will be analysed and compared across scenarios. RFC is a standard reference for measuring traffic congestion at a junction. Junctions that will be analysed include:

- Shannonpark
- Shanbally
- Port Access (entrance) junction(s)

These junctions were chosen because the proportion of Port related traffic travelling through them is higher at these locations and therefore will have the greater impact. This KPI assesses the local traffic impact of the proposed redevelopment and the results are presented in section 8.6.3.3.

As indicated previously it is standard practice to consider that a junction is congested when traffic flows are at 85% of the estimated capacity of a priority junction, or 90% of a signalised junction. At traffic flows above 90% of capacity the delays at a junction become erratic and are difficult to control. A value of 100% means that demand and capacity are equal and no further traffic is able to progress through the junction without experiencing significant delays.

Local junction analysis was undertaken using traffic flows from the PoCSTM for each modelling scenario. LINSIG analysis software was used for analysing the signalised junctions, Arcady software was used for analysing roundabouts and Picady software was used for analysing priority junctions. In Linsig software output volume over capacity ratios are described in terms of Degree of Saturation (DoS %). In Arcady and Picady software output is termed Ratio of Flow to Capacity (RFC %).

The scale of the impact is based on the threshold values of these parameters and it is the change in these values arising from the impact of the proposed redevelopment (Do Something) which indicates the extent of localised impact at the junctions assessed. – Table 8.11, below, refers to Roundabouts and other priority junctions and Table 8.12 refers to Signalised Junctions and summarises how the change in the value of these parameters indicates the performance impact.

Table 8.11: Impact on Volume over Capacity at Key Junctions (Roundabout)

RFC	Do Something			
Do Minimum	<75%	75-85%	85-90%	>90%
<75%	Negligible	Moderate	Major	Major
75-85%	Positive	Minor	Moderate	Major
85-90%	Positive	Positive	Minor	Major
>90%	Positive	Positive	Positive	Minor

It is assumed that if a roundabout is currently operating well within capacity (e.g. <75%) and the additional traffic associated with the proposed redevelopment causes the junction to be congested (i.e. over 85%) there will be a traffic impact of major significance. Conversely if the junction currently has congestion issues (e.g. 85-90%) and the traffic from the proposed redevelopment causes an increase in congestion, but within the same parameter value band (i.e. 85-90%) the impact of the proposed redevelopment is considered to be minor significance.

Table 8.12: Impact on Volume over Capacity at Key Junctions (Signalised)

DoS	Do Something			
Do Minimum	<80%	80-90%	90-95%	>95%
<80%	Negligible	Moderate	Major	Major
80-90%	Positive	Minor	Moderate	Major
90-95%	Positive	Positive	Minor	Major
>95%	Positive	Positive	Positive	Minor

It is assumed that if a signalised junction is currently operating well within capacity (e.g. <80%) and the additional traffic associated with the proposed redevelopment causes the junction to be congested (i.e. over 90%) the traffic impact will be of major significance. However, if the junction currently has congestion issues (e.g. 90-95%) and the traffic from the proposed redevelopment causes an increase in congestion, but within the same parameter value band (i.e. 90-95%) the impact on junction performance is considered to be minor significance, i.e. little change – still congested.

It should be noted that from the baseline review of the junctions at Shannonpark and Shanbally, these junctions are already operating at capacity during the AM and PM peaks.

8.6.2 Rating Impacts

The impact of the proposed redevelopment under each scenario will be rated using the assessment KPI framework detailed above as follows:

- Step 1: The relative changes between the 'Do Minimum' and 'Do Something' scenarios will be categorised as positive, negligible, minor, moderate or major (as above)
- Step 2: The likelihood of the impact occurring will be rated as either low, medium or high
- Step 3: The duration of the impact will be rated as short, medium or long term. As per EPA EIS guidelines, short-term equates to 1-7 years, medium term is between 7 and 15 years and long term is between 15 and 60 years

This method of rating impacts allows the 'Do Minimum' and 'Do Something' scenarios to be compared in a clear, concise and measurable way.

8.6.3 Prediction of Impact Magnitude

The results of the strategic and local traffic impacts for each scenario are described under each KPI below. In summary, the scenarios compared are:

- 2018 Do Minimum v 2018 Do Something – assuming existing infrastructure
- 2033 Do Minimum v 2033 Do Something – assuming Dunkettle Interchange and N28 both upgraded

To recap the Do Minimum and Do Something scenarios are described below.
'Do Minimum' relates to a situation where the proposed redevelopment does not proceed, i.e. business as usual. Therefore, all traffic generated by Ringaskiddy Port would be similar to existing traffic levels.

'Do Something' relates to a situation where the proposed redevelopment is approved and proceeds as expected. When the proposed redevelopment is operational, additional traffic above 'Do Minimum' traffic levels will be generated. The additional traffic will relate to the movement of goods associated with the increased levels of LoLo, Trade Cars, Bulks and RoRo cargo.

8.6.3.1 Journey Times on Key Routes

The two routes (Orange and Red) used for journey time impact assessment, illustrated in Figure 8.23, are:

- Orange: N28/ N28 Upgrade/ N40 between Ringaskiddy and Kinsale Road Roundabout
- Red: N28/ N28 Upgrade/ N40 between Ringaskiddy and Dunkettle Interchange

These routes represent journey times for traffic flows during the AM and PM Peak periods along the N28 and the N40, travelling in both directions, either between Ringaskiddy and Kinsale Road Roundabout on the N40 and Ringaskiddy and Dunkettle Interchange on the N40. Journey time impacts show the strategic traffic impact of the proposed redevelopment, including the impact of the relocation of Port operations from Tivoli and City Quays.

The tables below detail the results of the journey time comparison as extracted from the traffic model for each modelled scenario. Table 8.13 illustrates the AM Peak journey time results and Table 8.14 illustrates the PM results.

Table 8.13: AM Peak Journey Time Results (seconds)

AM	2018			2033		
Route	DS-DM (seconds)	% Diff	Impact	DS-DM (seconds)	% Diff	Impact
Orange (N-S)	54	5.14%	Negligible	78	11.10%	Minor
Orange (S-N)	9	0.88%	Negligible	-12	-1.49%	Negligible
Red (N-S)	59	4.76%	Negligible	115	12.49%	Minor
Red (S-N)	15	1.33%	Negligible	77	8.06%	Minor

The 2018 AM Peak results show that there is an increase in journey times in the AM Peak when comparing the Do Minimum and Do Something scenarios in the southbound direction. In 2018, the largest percentage increase is seen on Orange (N-S) route. The Orange (N-S) corresponds to the traffic travelling southbound from the Kinsale Road Roundabout to Ringaskiddy. The Red (N-S) journey time increase is also higher in the Do Something scenario which relates to southbound traffic travelling between Dunkettle Interchange and Ringaskiddy. All these journey time impacts are categorised as negligible traffic impacts. There are, however, further localised delays caused by the redevelopment, additional to delays already experienced in the Do Minimum scenario during peak periods, particularly at the junctions of Shanbally, Shannonpark and Carrs Hill in the AM Peak in 2018.

As mentioned previously, the 2033 analysis assumes that the N28 Upgrade is in place; and the journey times, in 2033, are taken along the N28 upgrade. The journey time differences between the Do Minimum and Do Something in 2033 are similar to 2018 and the assessment indicates that the impact of the proposed redevelopment is forecast to be minor or negligible in both scenarios for the reasons presented above in relation to the relative changes in journey time experienced between the Do Minimum and the Do Something scenarios and this is despite the journey time being considerably improved (i.e. quicker) in the 2033 scenario.

In this regard it should be noted that the impact of the N28 Upgrade is hugely beneficial for reducing traffic congestion along the N28 corridor and for reducing journey times. The traffic modelling results show that in 2018 the N-S journey time along the N28 (i.e. travelling from the N40 to Ringaskiddy) in the AM Peak Period in the Do Minimum is 908 seconds and in 2033 with the N28 Upgrade this reduces to 560 seconds. Therefore there is an approximate 38% improvement in journey time as a result of the N28 Upgrade in the AM Peak. Furthermore congestion at Shanbally and Shannonpark is reduced significantly in the order of 62% and 50% respectively in the AM Peak.

In 2033, in the AM Peak, there are no traffic impacts of major significance shown under this KPI.

Table 8.14: PM Peak Journey Time Results (seconds)

PM	2018			2033		
Route	DS-DM (seconds)	% Diff	Impact	DS-DM (seconds)	% Diff	Impact
Orange (N-S)	8	0.80%	Negligible	15	2%	Negligible
Orange (S-N)	74	7.71%	Minor	65	10%	Minor
Red (N-S)	7	0.72%	Negligible	136	17%	Moderate
Red (S-N)	83	6.97%	Minor	181	18%	Moderate

As shown above in Table 8.14, the 2018 PM Peak results are similar to the AM Peak in that there is an increase in journey times when comparing the Do Minimum and Do Something scenarios except that the impact is in the opposite direction (i.e. for the Orange (S-N) and Red (S-N) routes). The largest increase in percentage terms is seen on the Orange (S-N) route which is the route between Ringaskiddy and Kinsale Road Roundabout. The next highest increase is on the Red (S-N) route, which is the route between Ringaskiddy and Dunkettle Interchange. Both are categorised as minor impacts. As with the 2018 AM scenario, the delay is caused by traffic congestion experienced at Shannonpark and Carr's Hill.

As mentioned above, the beneficial impact of the N28 Upgrade is also demonstrated in the PM Peak results. The traffic modelling results show that in 2018 the S-N journey time along the N28 (i.e. travelling from Ringaskiddy to the N40) in the PM Peak Period in the Do Minimum is 822 seconds and in 2033 with the N28 Upgrade this reduces to 532 seconds. Therefore there is an approximate 35% improvement in journey time as a result of the N28 Upgrade in the PM Peak. Furthermore congestion at Shanbally and Shannonpark is reduced significantly in the order of 53% and 25% respectively in the PM Peak.

In 2033, in the PM Peak, there are no traffic impacts of major significance shown under this KPI. Full results of the assessment in terms of this KPI are provided in Appendix 8.8 (refer to EIS Volume III b).

8.6.3.2 Traffic Diversion Factor

By comparing the 2018 AM Peak Do Minimum and Do Something scenarios, the PoCSTM traffic model shows that 55 pcus divert away from the eastbound approach to Shanbally Roundabout due to congestion at this location. This equates to either 55 cars or 18 HGVs (one-way). The traffic model also shows that 86 pcus divert away from the northbound approach to Carrs Hill. This equates to either 86 cars or 29 HGVs (one way). This level of traffic diversion in the AM Peak in 2018 indicates that there is already significant traffic congestion along the N28 in the Do Minimum scenario, particularly on the eastbound approach to Shanbally junction and the northbound approach to Carrs Hill on the N28.

In 2018, the traffic impact of the Do Something scenario, through the addition of traffic generated by the proposed Ringaskiddy Port Redevelopment, are considered to have a traffic impact of major significance at these locations on the network in the AM Peak.

By comparing the 2018 PM Peak Do Minimum and Do Something scenarios, the PoCSTM traffic model shows that 46 pcus divert away from the westbound approach to Shannonpark Roundabout due to congestion at this location. This equates to either 46 cars or 15 HGVs (one-way). As with the AM Peak in 2018, this level of traffic diversion in the PM Peak in 2018 indicates that there is already significant traffic congestion along the N28 in the Do Minimum scenario, particularly on the westbound approach to the Shannonpark junction.

In 2018, the traffic impact of the Do Something scenario, through the addition of traffic generated by the proposed Ringaskiddy Port Redevelopment, is considered to have a traffic impact of major significance at this location on the network in the PM Peak.

In 2033, in both the AM and PM Peaks, there are no diversion impacts when comparing the Do Minimum with the Do Something and therefore, there are no impacts of major significance.

Full results of the Traffic Diversion Factor KPI assessment are provided in Appendix 8.8 (refer to EIS Volume III b).

8.6.3.3 Volume over Capacity at Key Junctions

Junction evaluations have been undertaken at Shanbally, Shannonpark and at the Ringaskiddy Port DWB access. The results of the local junction modelling are shown in the tables below. Both Shanbally and Shannonpark are tested in their current configuration as roundabout junctions. The Ringaskiddy West access junction is proposed and assumed to be a signalised junction (it is currently a priority junction i.e. without traffic signals).

Table 8.15 shows the AM Peak results of the Arcady analysis for Shanbally Roundabout. Arcady results are presented as Ratio of Flow to Capacity (RFC).

Table 8.15: AM Peak Volume over Capacity Results – Shanbally

		2018			2033		
		DM	DS	Impact	DM	DS	Impact
N28 Westbound	RFC (%)	23%	25%	Negligible	9%	9%	Negligible
	MMQ (vehs)	0.3	0.3		1	1	
Marian Terrace	RFC (%)	16%	16%	Negligible	4%	4%	Negligible
	MMQ (vehs)	0.2	0.2		0	0	
N28 Eastbound	RFC (%)	91%	91%	Negligible	36%	38%	Negligible
	MMQ (vehs)	9	9		1	1	

The AM Peak RFC KPI results for Shanbally junction, show that in the AM Peak Period in 2018, there is a negligible impact caused by the Ringaskiddy Port Redevelopment, because in the AM Peak in 2018 Do Minimum scenario the junction is already at capacity and congested along it's eastbound approach, as also shown above in the journey time analysis. The traffic travelling through Shanbally Roundabout is restricted and is moving slowly in a queue and thus there is very little impact in terms of change in the RFC parameter because of the additional traffic generated by the Ringaskiddy Port Redevelopment. The capacity issues associated with the junction are picked up by the traffic diversion factor described above in section 8.6.3.2.

The results for the 2033 AM Peak period for Shanbally show a negligible traffic impact. In 2033 the traffic flows travelling through Shanbally Roundabout are greatly reduced as a result of the N28 Upgrade. Therefore, in 2033 junctions along the existing N28, including the Shanbally Roundabout experience a significant reduction in congestion levels due to the presence of the N28 Upgrade and the fact the all Port HGV traffic uses the N28 Upgrade.

Table 8.16: PM Peak Volume over Capacity Results – Shanbally

		2018			2033		
		DM	DS	Impact	DM	DS	Impact
N28 West	RFC (%)	60%	67%	Negligible	31.1%	34.0%	Negligible
	MMQ (vehs)	1.5	2		1	1	
N28 East	RFC (%)	36.00%	39.40%	Negligible	13.1%	15.8%	Negligible
	MMQ (vehs)	0.6	0.6		1	1	
Marian Terrace	RFC (%)	16.20%	18.60%	Negligible	2.4%	2.4%	Negligible

As with the AM Peak period, in 2018 the PM Peak results, shown above in Table 8.16, also show negligible traffic impact caused by the Ringaskiddy Port Redevelopment. Similar to the AM Peak in 2018, the traffic travelling through the Shanbally Roundabout is restricted and thus there is a negligible traffic impact shown in terms of this KPI i.e. change in the RFC. However, the results do show that in the PM Peak Period in 2018 there is an increase in RFC travelling westbound towards Shanbally of 10% arising from the redevelopment.

In 2033 in the PM Peak period, the traffic flows travelling through Shanbally Roundabout are greatly reduced as a result of the N28 Upgrade and the proposed Ringaskiddy Port Redevelopment has no impact on this KPI (i.e. change in RFC) at Shanbally junction in 2033 during the PM Peak Period.

Table 8.17 shows the AM Peak results of the Arcady analysis for Shannonpark Roundabout. Arcady results are given as Ratio of Flow to Capacity (RFC).

Table 8.17: AM Peak Volume over Capacity Results – Shannonpark

		2018			2033		
		DM	DS	Impact	DM	DS	Impact
N28 Ringaskiddy	RFC (%)	42.10%	42.00%	Negligible	33.80%	33.10%	Negligible
	MMQ (vehs)	0.7	0.7		0.5	0.5	
R611 Carrigaline	RFC (%)	70.90%	69.40%	Negligible	12.60%	12.50%	Negligible
	MMQ (vehs)	2.4	2.2		0.1	0.1	
N28 Cork	RFC (%)	60.80%	63.10%	Negligible	36.60%	34.50%	Negligible
	MMQ (vehs)	1.5	1.7		0.6	0.5	

As with the results for Shanbally junction, the AM Peak results for Shannonpark show that in the 2018 AM Peak Period there is very limited impact caused by the Ringaskiddy Port Redevelopment because the PoCSTM traffic model, shows that the network is already very congested along the N28 in the AM Peak period without the redevelopment as also shown previously in the journey time analysis. The traffic model indicates that the traffic travelling through the Shannonpark Roundabout is restricted (i.e. the traffic is in a queue and travelling slowly) and thus there is very little impact shown in terms of this KPI i.e. the change in the RFC parameter. However, the results show that the RFC value increases for

traffic travelling in a southbound direction towards Shannonpark junction in the AM Peak period in 2018.

In 2033 in the AM Peak period, the traffic flows travelling through Shannonpark Roundabout are greatly reduced as a result of the N28 Upgrade and the Shannonpark Roundabout experiences a significant reduction in congestion and the proposed redevelopment has no impact on the junction in the 2033 AM Peak Period, in terms of this KPI in that it the proposed redevelopment only causes a negligible change to the value of the RFC parameter.

Table 8.18: PM Peak Volume over Capacity Results – Shannonpark

		2018			2033		
		DM	DS	Impact	DM	DS	Impact
N28 Ringaskiddy	RFC (%)	49.00%	49.00%	Negligible	31.80%	32.10%	Negligible
	MMQ (vehs)	1	1		0.5	0.5	
R611 Carrigaline	RFC (%)	51.50%	51.60%	Negligible	23.50%	23.30%	Negligible
	MMQ (vehs)	1.1	1.1		0.3	0.3	
N28 Cork	RFC (%)	57.30%	57.80%	Negligible	58.40%	57.80%	Negligible
	MMQ (vehs)	1.3	1.4		1.4	1.4	

As shown above in Table 8.18, the proposed redevelopment also has a negligible traffic impact on the 2018 PM Peak for the same reasons as with the AM Peak described above.

In the 2033 PM Peak, the proposed redevelopment has a negligible traffic impact for this KPI at Shannonpark for similar reasons to those indicated for the AM Peak Period at Shanbally.

8.6.3.4 Port Access Junctions

Access to Ringaskiddy Port is proposed at two locations:

- Ringaskiddy DWB – Proposed West Access; and
- Ringaskiddy Terminal M28 / N28- Proposed East Access.

Figure 8.24 illustrates the location of the proposed junctions.

To determine the optimum design for the proposed accesses a number of junction arrangements were designed and tested in terms of their capacity.

For both the proposed Eastern and Western accesses, the preferred junction arrangement is a four armed signalised junction arrangement with a pedestrian 'all red' phase. In 2018 (and for the period up to the opening of the N28 Upgrade, assumed to be 2023), the Port Of Cork will be served by one major junction access; a Western Signalised junction arrangement. This access has been assessed for future these design years 2018 and 2023 (i.e. pre-N28 Upgrade).

By future design year 2033, with the N28 Upgrade assumed to be in place, there is a second access assumed, east of Ringaskiddy village which connects directly with the N28 Upgrade. This access is a signalised junction and has been designed for 2033 traffic levels.

As part of the junction assessment process, the NRA and Cork County Council were consulted and the results of those consultations were incorporated into the junction layout designs as appropriate.

Since signalised junctions are proposed for the Ringaskiddy East and West accesses, LINSIG analysis software has been used in this junction assessment. Appendix 8.14 (refer to EIS Volume III b) details the AM and PM peak results of the LINSIG software analysis of the Ringaskiddy Port Proposed Access junctions. The proposed junction will be signalised for all proposed redevelopment scenarios and the LINSIG results are expressed in terms of Degree of Saturation (DoS). The capacity analysis for both these junctions demonstrates that the designs proposed accommodate anticipated traffic levels and there are no traffic impacts of major significance.

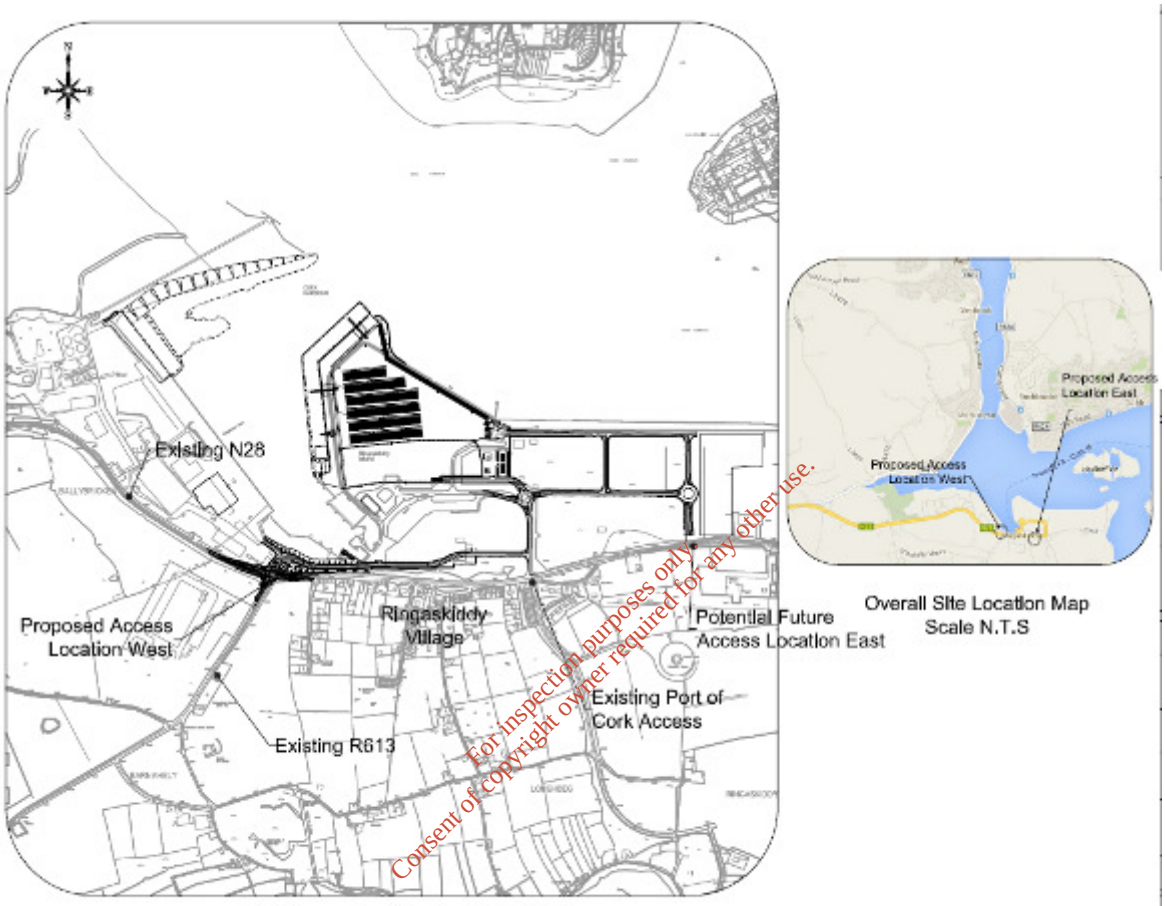


Figure 8.24 Port Access Location Map

8.6.4 Assessment of Impact Significance

8.6.4.1 Impact Significance in 2018

In 2018, there is traffic diversion resulting from the additional traffic generated by the proposed redevelopment during the AM and PM peak periods. The traffic impact is of major significance.

The likelihood of this impact is high. The duration of the impact is short term around peak periods only but will remain, until the opening of the N28 Upgrade (assumed to by 2023).

8.6.4.2 Impact Significance in 2033

In 2033, with the N28 upgrade in place, the impact of the proposed redevelopment does not create a traffic impact of major significance. Most of the traffic impacts identified in 2033 range from negligible to minor significance with only one traffic impact of moderate significance. Furthermore, the traffic

results show that with the N28 Upgrade in place in 2033 congestion is removed from the existing N28 at Shanbally and Shannonpark during the AM and PM peak periods.

8.6.5 Assessment of Construction Effects

The estimated volume of construction traffic generated by the proposed redevelopment is shown in Figures 8.25 and 8.26. It is estimated that there will be 9.3 HGVs per hour related to the DWB extension for a period of 11 months. In addition to this, there will be a peak of 17.7 HGVs per hour related to construction of Ringaskiddy East again for a duration of 24 months. For the purposes of the traffic impact assessment it has been assumed that, as a worst case scenario, these construction periods would run simultaneously. It has also been assumed that these are two-way flows and for every HGV arriving at site another HGV would leave site during the same hour. It is further assumed that construction vehicles travel along the N28, through the Jack Lynch Tunnel and travel northbound via the M8, the N20 or the N25.

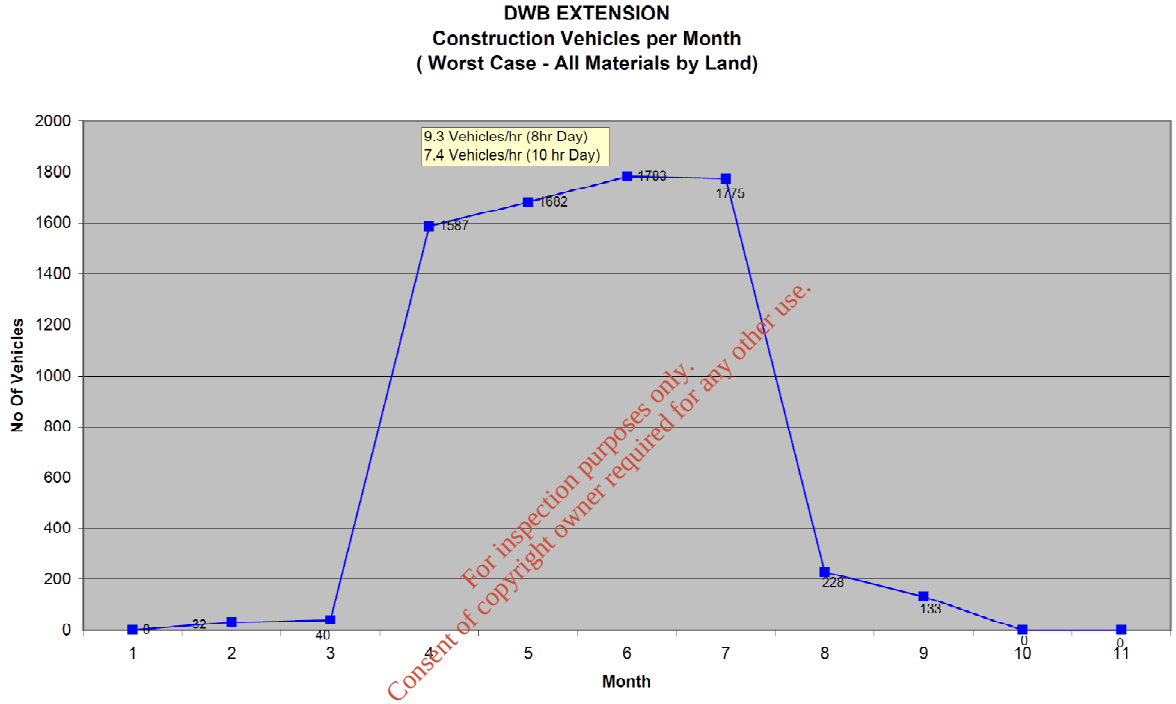


Figure 8.25: DWB Extension Construction Vehicles per Month

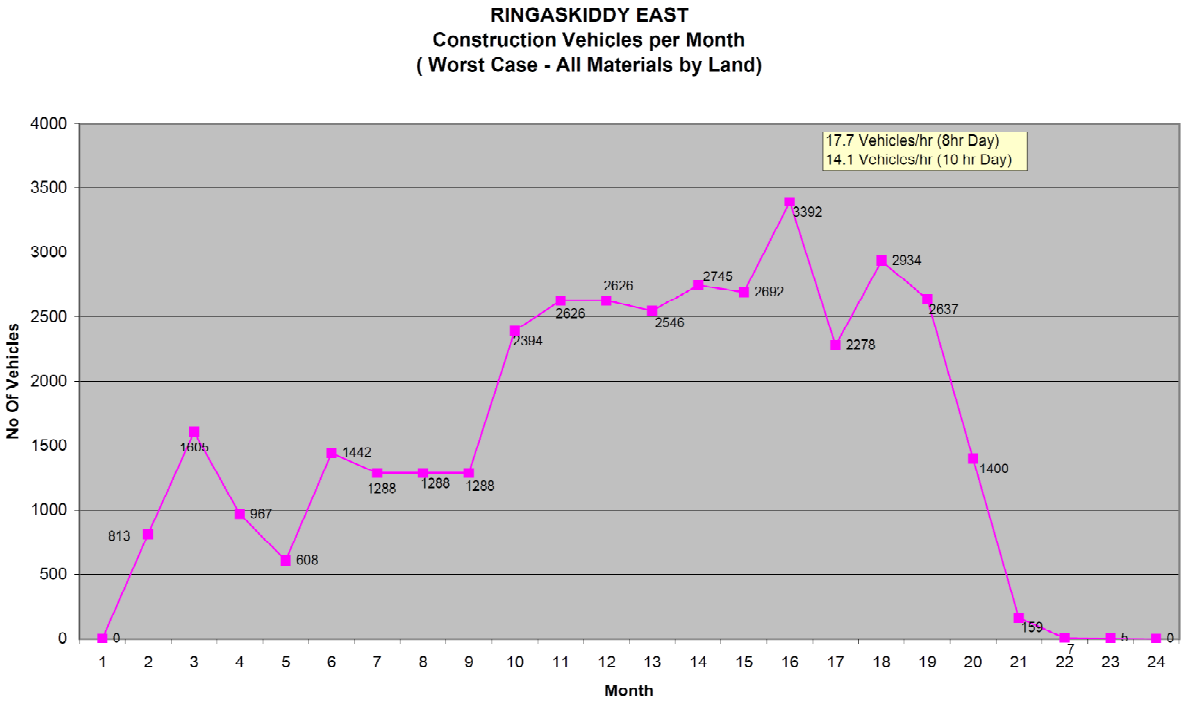


Figure 8.26: Ringaskiddy East Construction Vehicles per Month

For the purposes of the traffic modelling a construction year of 2017 is assumed. The results show the following impacts.

8.6.5.1 Journey Times on Key Routes

The two routes (Orange and Red) shown previously in Figure 8.23 were included in this assessment. Journey times in 2017 are taken along the existing N28, and in 2033 they are taken along the N28 upgrade.
The two routes (Orange and Red) used for journey time impact assessment are:

- Orange: N28/ N28 Upgrade/ N40 between Ringaskiddy and Kinsale Road Roundabout
- Red: N28/ N28 Upgrade/ N40 between Ringaskiddy and Dunkettle Interchange

These routes represent journey times for traffic flows during the AM and PM Peak periods along the N28 and the N40, either between Ringaskiddy and Kinsale Road Roundabout on the N40 and Ringaskiddy and Dunkettle Interchange on the N40.

The tables below detail the results of the journey time comparison with (DS) and without (DM) construction traffic Table 8.19 shows the AM Peak and PM Peak differences in journey time results.

Table 8.19: 2017 Construction Peak Journey Time Results (seconds)

	2017 AM			2017 PM		
Route	DS-DM (seconds)	% Diff	Impact	DS-DM (seconds)	% Diff	Impact
Orange (N-S)	29	2.89%	Negligible	8	0.82%	Negligible
Orange (S-N)	-4	-0.40%	Negligible	7	0.74%	Negligible
Red (N-S)	27	2.28%	Negligible	8	0.83%	Negligible
Red (S-N)	0	0.00%	Negligible	8	0.68%	Negligible

The assessment of construction traffic modelling results show that during both the AM and PM peak journey time impacts due to construction traffic are predicted to be negligible (i.e. little change in journey times) .

The full results of the construction traffic assessment in relation to impacts on journey times are provided in Appendix 8.9 (refer to EIS Volume III b).

8.6.5.2 Traffic Diversion Factor

By comparing the 2017 AM Peak Do Minimum and Do Something scenarios, the PoCSTM traffic model shows that 36 pcus are forced to divert away from Shanbally Roundabout due to congestion at this location. This equates to either 36 LVs or 12 HGVs (one-way). The traffic model also shows that 44 pcus divert away from the northbound approach to Carrs Hill. This equates to either 44 LVs or 15 HGVs (one-way). This level of traffic diversion in the AM Peak in 2017, therefore, indicates that there is additional traffic congestion along the N28 caused by construction vehicles generated by the proposed redevelopment.

By comparing the 2017 PM Peak Do Minimum and Do Something scenarios, the PoCSTM traffic model shows that 5 pcus are forced to divert away from Shanbally Roundabout due to congestion at this location. This equates to either 5 LVs or 2 HGVs (one-way). The traffic model also shows that 38 pcus divert away from Carrs Hill. This equates to 38 LVs or 13 HGVs (one-way).

Therefore, in 2017 the traffic impact is of major significance in both the AM and PM peaks.

Full results are provided in Appendix 8.9 (refer to EIS Volume III b).

8.6.5.3 Volume over Capacity at Key Junctions

The results of the local junction modelling of the construction impacts are shown in the tables below. Both Shanbally and Shannonpark are assessed as roundabout junctions. The Ringaskiddy West access junction is also tested but as a signalised junction.

Tables 8.20 and 8.21 below, show the AM and PM Peak results of the Arcady analysis undertaken for Shanbally and Shannonpark Roundabouts respectively. Arcady results are given as Ratio of Flow to Capacity (RFC).

Table 8.20: 2017 Construction Peak Volume over Capacity Results – Shanbally

		2017 AM			2017 PM		
		DM	DS	Impact	DM	DS	Impact
N28 Westbound	RFC (%)	19.90%	22.20%	Negligible	57.60%	57.60%	Negligible
	MMQ (vehs)	0.2	0.3		1.3	1.3	
Marian Terrace	RFC (%)	15.50%	15.60%	Negligible	35.00%	35.00%	Negligible
	MMQ (vehs)	0.2	0.2		0.5	0.5	
N28 Eastbound	RFC (%)	92%	92%	Minor	14.40%	14.40%	Negligible
	MMQ (vehs)	10	10		0.2	0.2	

The assessment results show that during both the AM and PM peak construction traffic will have a negligible impact on junction capacity at Shanbally Roundabout under this KPI.

Table 8.21: 2017 Construction Peak Volume over Capacity Results – Shannonpark

		2017 AM			2017 PM		
		DM	DS	Impact	DM	DS	Impact
N28 Ringaskiddy	RFC (%)	40.3%	40.4%	Negligible	50.3%	49.7%	Negligible
	MMQ (vehs)	0.7	0.7		1.0	1.0	
R611 Carrigaline	RFC (%)	72.5%	70.2%	Negligible	51.3%	51.3%	Negligible
	MMQ (vehs)	2.6	2.3		1.0	1.0	
N28 Cork	RFC (%)	59.7%	60.0%	Negligible	56.3%	56.8%	Negligible
	MMQ (vehs)	1.5	1.5		1.3	1.3	

The assessment results also show that during both the AM and PM peak construction traffic will have a negligible impact on junction capacity at Shannonpark Roundabout. As with the results for the operational phase of the redevelopment, the AM & PM Peak results for both Shannonpark and Shanbally show very limited impact caused by construction traffic generated by the Ringaskiddy Port Redevelopment. However, in 2017, results from the strategic modelling undertaken using the PoCSTM traffic model, show that the network is congested along the N28 in the AM Peak period and to a lesser extent in the PM Peak which causes some traffic to divert away from Shanbally. This KPI, therefore, while adequately reflecting the construction impact on the KPI parameters selected, will not of themselves reflect the level of congestion on the N28.

Full results of the traffic impact assessment of construction traffic are provided in Appendix 8.9 (refer to EIS Volume III b).

8.6.6 Assessment of Impact Significance during Construction

8.6.6.1 Impact Significance during Construction (2017)

In 2017, during construction, there is traffic diversion resulting from the additional traffic generated by the proposed redevelopment during the AM and PM Peak Periods. The traffic impact is of major significance.

The likelihood of this impact is high. The duration of the impact is short term.

8.7 Mitigation Measures

8.7.1 Operational Element

In summary, the traffic modelling results indicate that in 2018, the N28 in its current form has very limited spare capacity to cater for increases in traffic levels in the AM and PM Peak Periods above the Do Minimum levels, particularly additional HGV traffic. In 2033 the traffic modelling results show that, with the N28 Upgrade in place, there is significant spare road capacity to cater for the Do Something HGV traffic levels during the AM and PM Peak periods along the N28. Furthermore, in 2033, the Dunkettle Interchange Upgrade is also assumed and this greatly improves the operating environment on the N40.

Mitigation measures are developed for traffic impacts of major significance that are identified and the introduction of these measures is tested to demonstrate their effectiveness in avoiding, reducing or remedying these traffic impacts of major significance. The mitigation measures required may be categorised as traffic control measures.

In 2018, traffic impacts of major significance have been identified along the N28 at the following locations:

- N28 Carrs Hill
- N28 Shannonpark Junction
- N28 Shanbally Junction

The traffic impacts identified are in the AM and PM peak periods and relate to some localised journey time impacts at the above junctions and particularly traffic diversion impacts which generate significant re-routing of traffic away from Shanbally (in the AM Peak) and Shannonpark and Carrs Hill (in the PM Peaks) due to congestion at these locations (which exists in the Do Minimum scenario).

The mitigation required to reduce the major significant traffic impacts identified has been determined by using the traffic diversion factor KPI as a guide to the number of HGVs that would need to be reduced.

The traffic diverting in the 2018 AM peak is equivalent to 86 pcus (86 cars or 29 HGVs) and therefore the required mitigation is the reduction of at least 29 HGVs. It is important to remember that this number of HGVs corresponds to the eastbound direction (one-way) volume of Port traffic in the AM Peak Period.

The traffic forced to divert in the 2018 PM Peak is equivalent to 46 pcus (46 cars or 15 HGVs). This shows that the required mitigation is the reduction of at least 15 HGVs. Again this is one-way traffic and corresponds to the westbound direction volume of Port traffic in the PM Peak Period.

The traffic modelling shows that in 2018 to reduce the significance of traffic impacts generated by the proposed redevelopment, HGVs generated by the proposed redevelopment during the AM and PM Peak periods need to be curtailed to the Do Minimum levels until the opening of the N28 Upgrade. By doing this the residual traffic impact will be negligible.

Therefore, in 2018 and pre N28 Upgrade, the mitigation measures to reduce the traffic impacts of major significance identified above are as follows:

Mitigation Control (2018 and Pre- N28 Upgrade)
Reduce Port HGV traffic volumes to Do Minimum levels during the AM (07.45-09.00) and PM (17.00-18.00) commuter peak periods by introducing the Ringaskiddy Mobility Management Plan (RMMP) to manage freight generated by the Port during these periods until the opening of the N28 Upgrade.

In 2033 (with the N28 Upgrade in place), there are no traffic impacts of major significance predicted as there is significant spare road capacity and therefore no mitigation is required.

8.7.1.1 Management of Freight through the Ringaskiddy Mobility Management Plan

This proposed mitigation control measure is to manage the additional Port related HGV traffic that is generated over Do Minimum levels during the AM and PM commuter peaks until the N28 Upgrade is in place. This means that the additional 'Do Something' LoLo, bulk and trade cars and related HGVs movements generated by the proposed redevelopment (i.e. above the existing 'Do Minimum' HGVs movement levels), would be managed and controlled to significantly reduce the additional numbers of Port HGVs travelling during the congested AM and PM Peak periods. All additional Port generated HGV traffic arising from the proposed redevelopment would be managed to operate in the non-congested inter-peak period of the day where there is significant spare road capacity available. It is important to note that currently less than 15% of all Port related HGVs travel during the AM and PM peak periods, whereas the remaining 85% currently travel outside of these times. Only a small proportion, therefore, of HGVs generated by the Port (i.e. only 15% of the additional HGV's generated by the proposed redevelopment require managing).

The benefit of introducing the RMMP, to manage freight generated by Ringaskiddy Port, enables the Port to operate more efficiently and importantly to manage how Port generated HGVs use the road network. Currently freight movement at the Port is demand driven with the Port offering extensive flexibility to its customers in determining the movement of freight. The introduction of the RMMP to

manage freight will move the port from a demand driven freight mobility operation to a fully planned and managed freight movement operation and cascade significant benefits to many aspects of Port operations including enhanced security, control and management and information systems. This progression to greater control and management of freight and cargo operations has been an ongoing element of the modernisation and efficiency drive at Port of Cork for the past decade.

The proposed redevelopment at Ringaskiddy and the requirement for the Port to introduce Port HGV traffic mitigation measures in order to mitigate the impact of the proposed redevelopment on peak traffic on the N28 presents a unique opportunity to Port of Cork to introduce a greatly enhanced freight management and control system incorporating the required traffic mitigation measures which will result in a step change in Port of Cork's current modernisation drive to become a best in Class International Port facility.

There are a number of measures which can be used to control 'Do Something' Port related HGVs. Importantly, many of these measures are used successfully at other international ports to manage the efficiency of Port operations and to control the throughput of Port HGVs onto the road network, particularly during peak periods. Ports that successfully operate mobility management include Rotterdam and Felixstowe for example.

The RMMP is based on international best practice and extensive consultation with other international Ports, Dublin Port and those involved with current Ports operations and haulage at Port of Cork sites (at Ringaskiddy, Tivoli and City Quays). This RMMP details 'how' the Port will successfully manage Port related HGVs during peak trafficked periods.

The freight traffic management systems and measures proposed as part of the RMMP include:

- The development of a **booking system** to manage the discharge of HGV traffic onto the strategic road network over the whole day, to minimise the impact of Port traffic on peak traffic periods and to reduce truck queuing in and out of the Port. The specific measures include:
  - Each haulier would be required to register an arrival/ departure online
  - Hauliers collecting/ dropping off during peak hours would be required to book an arrival/ departure time.
  - During peak periods, only hauliers with booked slots would be allowed to enter/ exit at the express gates. Non-scheduled arrivals would be facilitated at non-express gates (where they would be queued to discourage unscheduled arrivals / departures during Peaks)
  - Each haulier would be given an allotted area to park
  - Provision would be made for emergency loads
- Controlling and Optimising **gate operations**, to regulate the HGV traffic flow rate onto the strategic road network. The specific measures include:
  - PoC will introduce an automated gate operation in line with modern terminal best practice, taking account of volume throughput at the terminal
  - Gated entry and exit lanes sited a significant distance back from the public road, allowing sufficient room for HGV queuing within the PoC boundary
  - Express gates will facilitate those with bookings. Vehicles without a booking will be facilitated through non-express gates
  - Sufficient space will be provided inside gates for dealing with issues that may arise with booking references, ID cards, etc.
- Extend **operating hours**, to facilitate Port HGV traffic spreading outside of AM and PM peak periods, in particular bulk related traffic. The specific measures include:
  - Extended operating hours will facilitate hauliers to spread their arrival and departure times during off-peak periods within the managed access control system
  - Opening hours will be adapted to suit traffic volumes and terminal operations and will be reviewed on an ongoing basis
- The use of **IT solutions** to transfer information and communicate with hauliers. The Specific measures include:
  - PoC will introduce an information service for customers that wish to subscribe to provide information regarding port operations and road/ traffic conditions to hauliers

By introducing the above measures at Ringaskiddy Port the volume of HGVs entering and exiting the Port can be managed, in particular during peak hours, thereby significantly reducing the impact Port of Cork traffic will have on the surrounding road network.

The proposed gate system will allow for regulation and the control of traffic flows into and out of the Port. Vehicles will be released at regular intervals onto the strategic road network, and the volume can also be managed during peak hours, as required.

8.7.1.2 Monitoring and Evaluation

The above RMMP measures will be implemented over time. As mentioned previously the Port of Cork has consulted with hauliers, line agents, bulk operators etc. through workshops and meetings to understand how they currently operate and to explain the concept of mobility management and describe how it will work. Hauliers are generally supportive of the proposed RMMP and the Port of Cork are in the process of getting hauliers to sign up to the management process set out in the RMMP.

The Port of Cork has agreed a delivery programme for the freight management component of the RMMP, which is shown in Table 8.22. One of the key features includes the piloting of a booking and scheduling system in Tivoli in 2014 in order to ensure that the system is fully tried and tested prior to roll out in Ringaskiddy.

As part of this programme, all measures will be reviewed and updated on a regular basis. Monitoring and evaluation will be undertaken in three parts:

- during implementation
- after implementation, where the before and after situations are compared
- annual monitoring, in order to be able to adjust the measures set out in the RMMP according to changing circumstances

A key aspect of the success of the RMMP will be monitoring of HGV volumes generated by the Port from its operation in Ringaskiddy. Annual monitoring and evaluation will ensure the continued success of the RMMP. This process will involve consultation with hauliers, freight forwarders and line agents and other stakeholders such as Cork County Council, Cork City Council, the NRA, the NTA and the local community. The results of this monitoring will be evaluated and the RMMP will be updated if required. Further details are included in Appendix 8.4 (refer to EIS Volume III b).

Task	Sub-task	Date completed	Date Planned
Step One - Review Your Travel Patterns and Policies			
Understanding Best Practice			
Literature Review		Mar - June 2013	
Site Visits			
	Dublin Port Burke Shipping	Jul-13	
	Rotterdam Softpak	Jul-13	
	Rotterdam Kramer	Jul-13	
	Rotterdam Uniport	Jul-13	
	Rotterdam APM Terminal	Jul-13	
	Dublin Port Eucon	Aug-13	
	Felixstowe	Sep-13	
Understanding Existing Conditions			
Site Surveys		Apr-13	
Consultation			
	Employee Survey	Oct-12	
	Haulier Survey	May-13	
	Haulier Workshop	Jul-13	
	Line agent meeting	Jul-13	
	Bulk Survey	Aug-13	
	Bulk Operator Meetings	Sep-13	
Step Two - Identify and Implement Actions			
Developing Mobility Management Plan			
Develop MMP measures		Jul - Sept 2013	
1st Draft MMP		Sep-13	
2nd Draft MMP		Dec-13	
Finalise RMMP measures	*see Freight MMP & Employee MMP*	Apr-14	
Define programme of measures		Apr-14	
Final MMP		Apr-14	
Management			
Assign Mobility Manager	*Operations Manager*		May-14
Buy in from hauliers			Jun-14
Step Three - Monitor Your Action Plan			
Monitoring and Evaluation			
Develop VBS			Feb-Jun 2014
"Before Implementation" Survey	*Traffic surveys, stakeholder consultation*		May-14
Testing VBS			Jun-14
Physical Works			Jun-15
Trial VBS			Jun-Aug 2014
Full trialling			Jun-15
Hauliers required to use VBS			Sep-15
"After implementation" survey	*Traffic surveys, stakeholder consultation*		May-16
Implementation analysis			Jun-16
Update MMP (if required)			Jul-16
Ongoing Monitoring and Evaluation			
Annual monitoring	*Traffic surveys, stakeholder consultation*		every May
Annual analysis			every June
Annual update of MMP			every July

Table 8.22: Ringaskiddy Mobility Management Plan Programme for Freight Management

8.7.2 Construction Element

During construction, in 2017, the number of construction vehicle HGVs entering the road network will be reduced by 15 and 13 respectively during the following peak periods:

- **AM Peak** 07:45 – 09:00
- **PM Peak** 17:00 – 18:00

The contractor responsible for the construction of the proposed redevelopment will be required to ensure that the number of construction vehicles entering the road network during these times will be limited to 12 and 14, per direction, in the AM and PM peaks respectively.

Construction vehicles will be required to use the strategic road network to access the site i.e. using the N28 and N40.

In addition construction vehicles will be restricted from using local roads or unsuitable roads on grounds of safety

Full details of the construction mitigation traffic impacts are provided in Appendix 8.11 (refer to EIS Volume III b).

8.7.3 Residual Impacts

8.7.3.1 Operational Phase (2018)

The traffic modelling results indicate that the primary cause of congestion on the N28 is the background levels of commuter traffic which greatly exceeds the volume of traffic arising from the proposed redevelopment and so the proposed redevelopment cannot be regarded as causing or being solely responsible for the congestion but merely a contributor to it.

As mentioned previously there is significantly more capacity available on the strategic road network in the Inter Peak period, when compared to the AM and PM Peaks, to accommodate increased Port HGVs. Through the RMMP, this traffic can be spread more evenly across the interpeak period thereby reducing the impact on the strategic road network considerably, particularly during the AM and PM peaks.

The traffic modelling post mitigation results (i.e. following the introduction of the RMMP measures) show that journey times revert back to Do Minimum levels and there is no traffic diversion. There are, therefore, no major significant traffic impacts in either the AM or PM peaks arising from the HGV volumes generated by the Port redevelopment which are effectively brought back to Do Minimum HGV levels.

Figures 8.27 to 8.29 provide an illustration of the effectiveness of the RMMP measures to redistribute Port HGVs away from the peak periods into the inter peak period where there is significantly more capacity available on the existing N28. These figures focus on the existing N28 at Shanbally in 2018 where congestion is most concentrated during the peak periods. The junction at Shanbally, therefore, provides a very good example of how this will work in principle for the rest of the N28 and N40.

Figure 8.27 provides the daily profile of traffic at Shanbally in 2018 in the Do Minimum scenario. The background traffic levels are shown in blue and the Port HGV traffic levels are shown in red. As can be seen from this profile the busiest time for traffic at Shanbally, in the AM Peak, is generally between the hours of 07.45-09.00. For the PM, the hours of 17.00-18.00 represent the busiest period.

This profile also demonstrates that the traffic levels in the inter peak, i.e. between the hours of 09.00-17.00 are substantially less than traffic levels in the AM and PM Peak. On average, in 2018 Do Minimum, traffic levels in the inter-peak at Shanbally are in the order of 44% less than in the peak periods. This clearly indicates a significant level of spare capacity in the inter peak period.

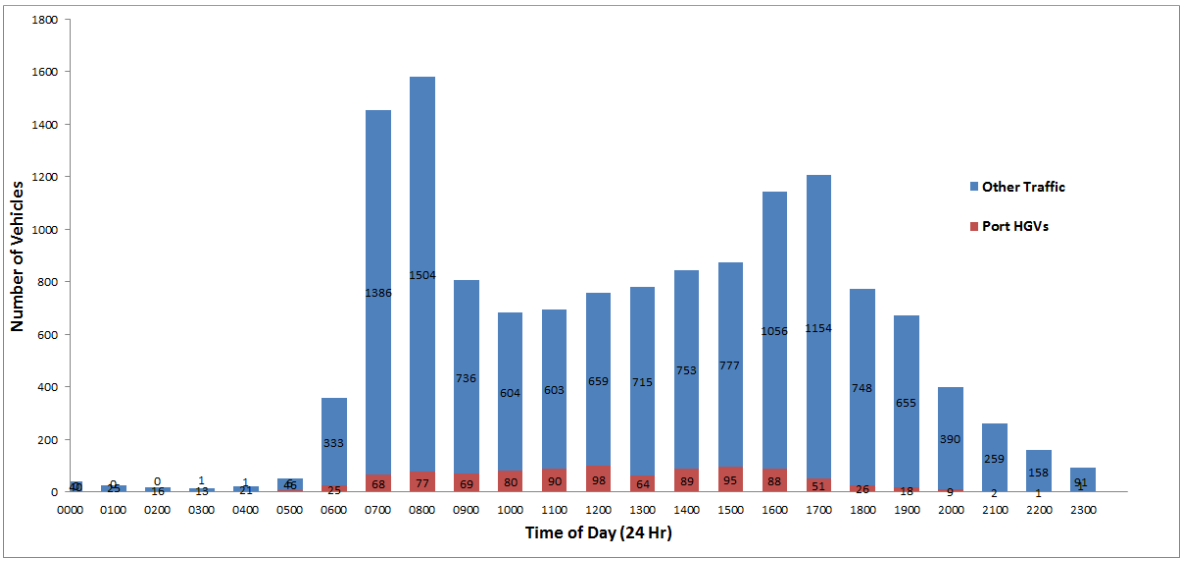


Figure 8.27: 2018 Daily Traffic Distribution at Shanbally - Do Minimum

Figure 8.28 provides the daily profile of traffic at Shanbally in 2018 in the Do Something scenario without mitigation (i.e. the application of the RMMP). The background traffic levels (i.e. all N28 traffic other than Port HGV;s) are shown in blue and the Port HGV traffic levels are shown in red. The difference between the Do Minimum and Do Something (no mitigation) is that there is an increase in HGV volumes leaving the Port in both the AM, inter peak and PM peak periods. We know from the impact analysis that there is limited available road capacity at Shanbally to cater for increases in HGV volumes from the Port during the Peak Periods, therefore, mitigation is required.

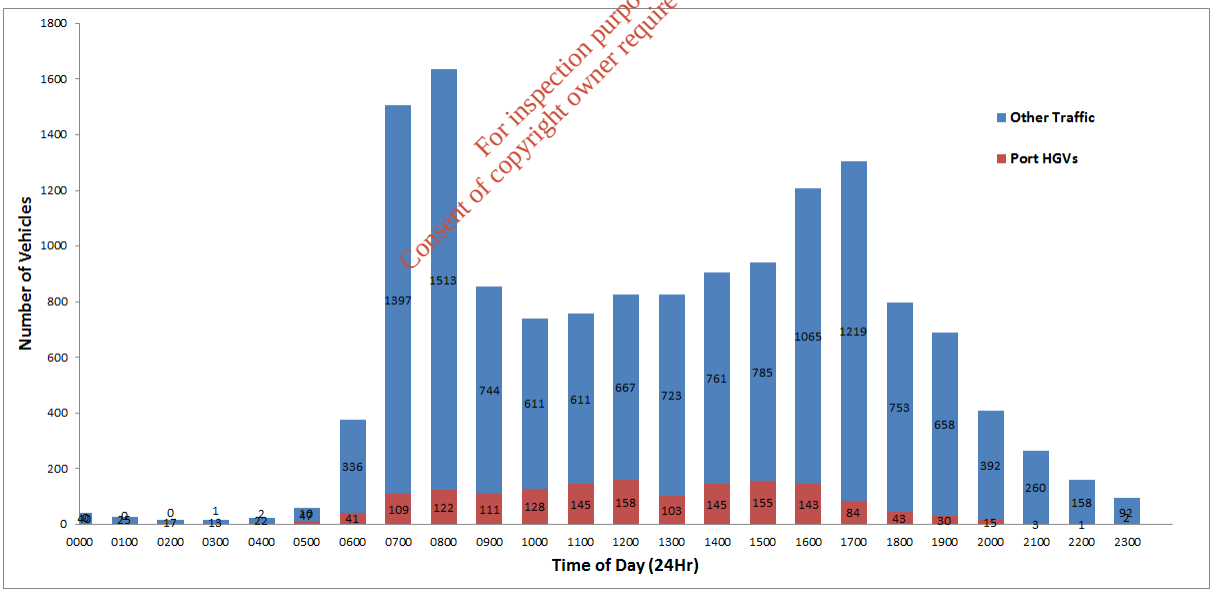


Figure 8.28: 2018 Daily Traffic Distribution at Shanbally - Do Something (Pre-Mitigation)

Figure 8.29, provides the daily profile of traffic at Shanbally in 2018 in the Do Something scenario with mitigation applied (i.e. the RMMP measures are applied). The background traffic levels are shown in blue and the Port HGV traffic levels are shown in red. The difference between the Do Minimum and Do Something (with mitigation) is that there is only an increase in HGV volumes leaving the Port in inter peak period. The RMMP controls the level of HGV traffic during the AM (07.45-09.00) and PM (17.00-18.00) peak periods. The effect this has on capacity is negligible. The increase in HGV volumes in the Do Something scenario with the RMMP applied over the Do Minimum travelling in the inter peak period is 532. This increase equates to an increase of 7.5% above Do Minimum levels over the full day.

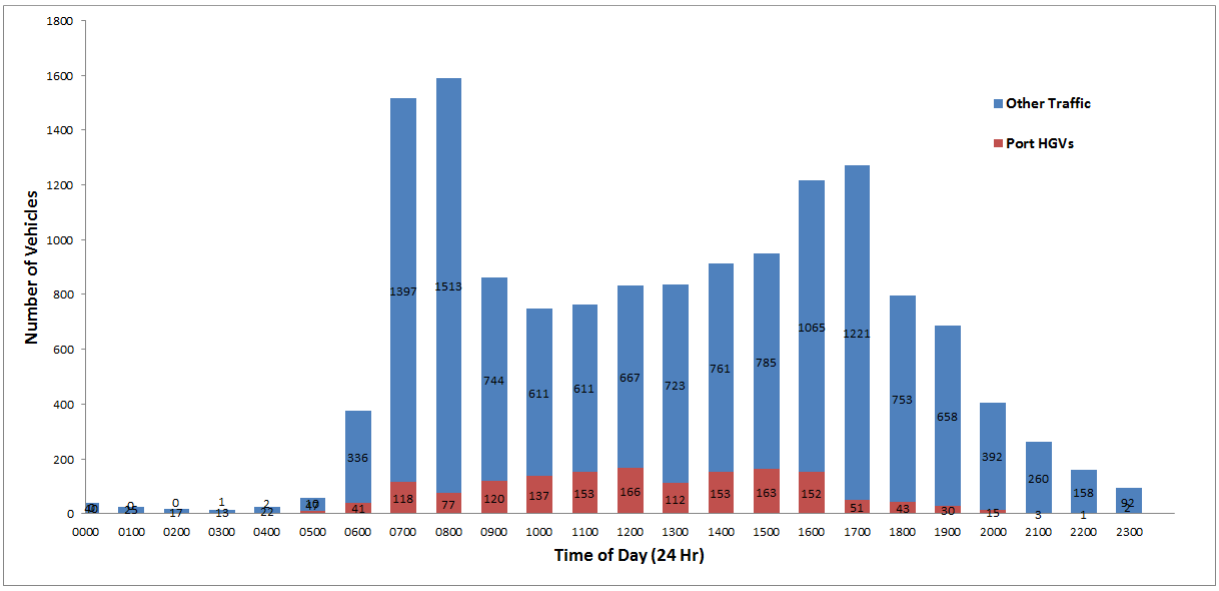


Figure 8.29: 2018 Daily Traffic Distribution at Shanbally - Do Something (Post-Mitigation)

Figure 8.30, below, shows the relationship between traffic levels in the peak period and the Inter Peak Period at Shanbally for the three modelling scenarios described above, i.e. Do Minimum, Do Something and Do Something plus mitigation (referred to in the figure as Do RMMP). In the Do Minimum scenario the inter peak traffic levels are approximately 59% of the peak period traffic levels. In the Do Something scenario, when comparing to the Do Minimum, the effect of the Do Something scenario is to increase the peak period traffic levels by 6% and the inter peak traffic levels by 4%.

In the Do RMMP scenario, when comparing to the Do Minimum scenario, the peak period traffic levels increase by only 2% and the inter peak traffic levels increase by 5%. The 2% increase in traffic levels relates to the additional Ringaskiddy Port workers accessing the redevelopment. It should be noted that this additional traffic has no significant impact on the capacity of the road network.

These figures illustrate that the traffic levels in the inter peak, at Shanbally, are on average 40% less than the peak periods. The impact of transferring Port HGV traffic into the inter peak increases only increase traffic levels by on average 5%. Even with this increase the traffic levels in the inter peak remain 35-37% less than the peak periods.

In summary, following the introduction of mitigation, in 2018, there will be no residual impacts of major significance.

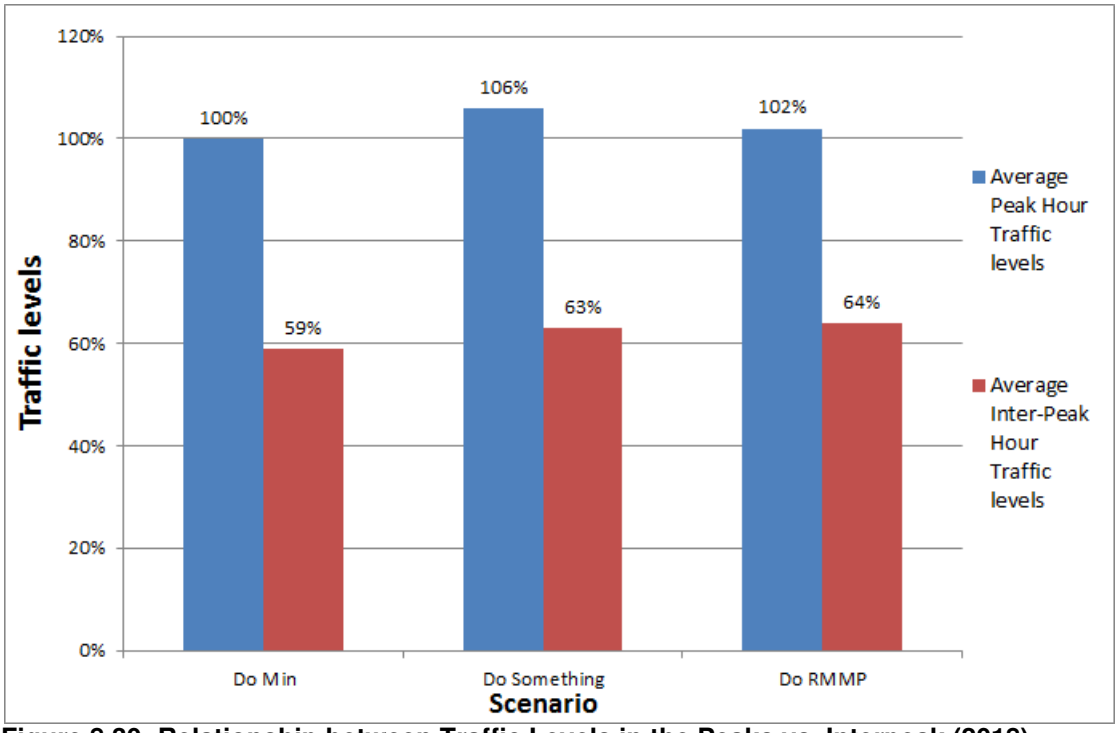


Figure 8.30: Relationship between Traffic Levels in the Peaks vs. Interpeak (2018)

8.7.3.2 Operational Phase (2033)

In 2033, there is far more capacity available on the strategic road network providing greatly improved access to Ringaskiddy with upgrades to Dunkettle Interchange (N40) and the N28 providing this uplift in capacity. In 2033, therefore, the traffic generated by the proposed redevelopment will be easily accommodated on the strategic road network which allows the Port to operate the new RoRo facility and to remove the need to restrict traffic in the AM and PM peak periods (as is the requirement in 2018 and onwards until the delivery of the N28 Upgrade).

In 2033, therefore, there are no residual traffic impacts anticipated.

However it is important to note that despite the removal of the need to restrict the movement of Port HGV's during the peak periods, the Port will continue to maintain, improve and implement its freight management and control systems into the future in line with best international practice and technology developments. It will also continue to operate and implement its freight mobility managements system including the monitoring and reporting of Port traffic and undertaking ongoing consultation with key stakeholders etc.

Full results are provided in Appendix 8.10 (refer to EIS Volume III b).

8.7.3.3 Construction Phase

Following mitigation, there will be no major impacts during the construction phase of the proposed redevelopment.

8.7.4 Cumulative Impacts

For the operation phase assessment of the proposed redevelopment, cumulative traffic volumes have been included in the predicted traffic levels for future years 2018 and 2033. The same NRA traffic growth figures that were used for the Dunkettle Interchange Assessment have also been used for this traffic assessment.

For the construction phase assessment in 2017, cumulative traffic volumes includes for other planned construction projects such as East Tip Remediation Project at Haulbowline Island and the N28 Upgrade.

8.7.5 Sensitivity Testing

This section considers the potential implications on traffic impacts and mitigation requirements of variations in infrastructure delivery and phasing (i.e. from those assumed in the Core tests described above). This is done by way of sensitivity testing using the PoCSTM Traffic Model. In addition to the opening year, 2018, and the design year, 2033, an interim year of 2023 has also been considered. The year 2023 has been chosen as it represents a conservative view with regard to when the N28 Upgrade will be built and also represents a +5 year assessment year which the NRA Traffic and Transportation Guidelines recommend as a test year.

The infrastructure sensitivity tests are listed below:

- **Sensitivity Test 1 2033 with existing infrastructure**: This includes the 2018 Core with the Dunkettle Interchange upgrade tested in the design year – 2033, for 'Do Minimum' and 'Do Something' development. The purpose of this test is to stress test the requirements of the RMMP in 2033 in a situation where the N28 is not upgraded;

- **Sensitivity Test 2 2023 with existing infrastructure**: This includes the 2018 Core tested in an interim future year – 2023, for 'Do Minimum' and 'Do Something' development. The purpose of this test is the same as that of Sensitivity Test 1;

- **Sensitivity Test 3 2023 with full N28 Upgrade**: This includes the 2033 Core (i.e. N28 Upgrade assumed) tested in an interim future year – 2023, for 'Do Minimum' and 'Do Something' development;

- **Sensitivity Test 4 2023/33 with N28 Upgrade to R613**: This includes the 2033 Core (N28 Upgrade assumed but terminating at the R613) tested in an interim future year – 2023, and the design year – 2033, for 'Do Minimum' and 'Do Something' development

In summary, the results of the sensitivity testing using the PoCSTM Traffic Model show that:

Sensitivity Test 1 2033 with existing infrastructure There are traffic impacts of major significance generated by the proposed redevelopment in the AM and PM peaks (i.e. similar to those identified in 2018 core test) therefore the RMMP is required to manage freight movements from the Port to mitigate these traffic impacts. Following the introduction of the RMMP, in this scenario, there are no traffic impacts of major significance during the AM and PM peaks. However it should be noted that in the absence of the N28 Upgrade there will be significant operational and logistical difficulties for the Port to continue to restrict HGV traffic during the AM and PM peaks beyond 2023 up to 2033.

Sensitivity Test 2 2023 with existing infrastructure: There are traffic impacts of major significance generated by the proposed redevelopment in the AM and PM peaks (i.e. similar to those identified in 2018 core test) therefore the RMMP is required to manage freight movements from the Port to mitigate these traffic impacts Following the introduction of the RMMP, in this scenario, there are no traffic impacts of major significance during the AM and PM peaks. However, as identified above in Sensitivity Test 1, in the absence of the N28 Upgrade there will be significant operational and logistical difficulties for the Port to continue to restrict HGV traffic during the AM and PM Peaks beyond 2023.

Sensitivity Test 3 2023 with full N28 Upgrade: There are no traffic impacts of major significance and therefore mitigation is not required.

Sensitivity Test 4 2023/33 with N28 Upgrade to R613: There are no traffic impacts of major significance and therefore mitigation is not required. However this scenario provides sub-optimal connectivity for the Port at Ringaskiddy and for the Ringaskiddy area in general when compared to the option which provides N28 Upgrade connectivity both East and West of Ringaskiddy village.

Full results are provided in Appendix 8.12 (without mitigation) and Appendix 8.13 (with mitigation). These are contained in EIS Volume III b.

8.7.6 Conclusions

8.7.6.1 Summary of Traffic Assessment

The principal access route to the Port of Cork facilities at Ringaskiddy is the N28 which connects the Port to the wider National Road Network via the Bloomfield Interchange on the N40 (South Ring Road). There are some infrastructure upgrades proposed within this network (which have been assumed for traffic modelling purposes), including proposed upgrades to the N28 (assumed to be in place in 2023) and to Dunkettle Interchange (assumed to be in place by 2020). The N28 and N40 currently experience congestion in the AM and PM peaks at locations such as Shanbally, Shannonpark, Carrs Hill, Mahon Interchange, Kinsale Roundabout and at Dunkettle Interchange which creates queuing in the Jack Lynch Tunnel during these peak trafficked times. These traffic issues will remain during the peak periods until the Dunkettle Interchange and the N28 Upgrades are delivered. However, outside of the AM and PM peaks there is significantly more road capacity available on the N40 and N28 to cater for increases in traffic.

Two forecast year scenarios are tested through the Port of Cork Strategic Transport Model (PoCSTM) including a 2018 Do Minimum (no redevelopment) and Do Something (with redevelopment) and a 2033 Do Minimum (no redevelopment) and Do Something (with redevelopment). In the 2018 scenarios it is assumed that there are no changes to the existing infrastructure. However, in the 2033 scenarios it is assumed that the Dunkettle Interchange is upgraded and that the full N28 Upgrade is in place between Bloomfield Interchange and east of Ringaskiddy village. In terms of the demand for travel, the 'Do Minimum' scenarios assume, for Ringaskiddy and the other port sites at Tivoli and City Quays, some additional growth over existing levels, however there will be some reduction in activity over time due to trade diverting to other ports as Port of Cork becomes less competitive because of its inability to accommodate larger vessels which offer economy of scale.

For the 'Do Something' scenarios, traffic is generated by three phases as follows:

- Phase 1 development – an increase in LoLo, General Cargo and Trade Cars operations
- Phase 2 development – an increase in Bulk operations
- Phase 3 development – an increase in RoRo operations (Phase 3, the new RoRo facility will not be operational until after the N28 Upgrade is in place, therefore it is only assumed to be operational in 2033).

The traffic impact of the proposed redevelopment is assessed using KPI's that measure journey times on key routes, traffic diversion, and volume of capacity at key junctions. The traffic impact assessment for the operational phase of the redevelopment shows that, in 2018, there is a traffic impact of major significance in the AM and PM Peaks requiring mitigation. The proposed mitigation measure is reduce Port HGV traffic volumes to Do Minimum levels during the AM (07.45-09.00) and PM (17.00-18.00) commuter peak periods by introducing the RMMP to manage freight generated by the Port during these periods until the opening of the N28 Upgrade. The management of freight will include utilising the available road capacity outside the peak periods to accommodate the movement of Port HGVs to and from Ringaskiddy. Following the introduction of mitigation, in 2018 during the operational phase of the proposed redevelopment there will be no residual traffic impacts of major significance.

In 2033, with the N28 upgrade in place, there are no traffic impacts of major significance due to the proposed redevelopment for both the AM and PM peaks.

During the construction phase of the proposed redevelopment, there are traffic impacts of major significance in the AM and PM peaks requiring mitigation. There will be a requirement, for the contractor responsible for the construction works, to reduce the number of construction traffic vehicles entering the road network during the AM (07.45-09.00) and PM (17.00-18.00) commuter peak periods to 12 and 14 respectively. Furthermore, construction vehicles will use the strategic road network to access the site i.e. using the N28 and N40. In addition Construction vehicles will be restricted from using local roads or unsuitable roads on grounds of safety. Following the introduction of mitigation, in 2017 during the construction phase, of the proposed redevelopment there will be no residual traffic impacts of major significance.

8.7.6.2 Ringaskiddy Mobility Management Plan (RMMP)

The RMMP is an innovative and forward looking sustainable management process which the Port of Cork are committed to delivering to manage its freight and cargo operations and to control how HGV traffic generated by the Port, accesses the strategic road network, in advance of the delivery of the N28 Upgrade.

The RMMP is structured on the basis of international best practice. It enables the Port to develop in a sustainable way, and it will provide a mechanism for managing freight traffic on the road network, including restricting freight during peak traffic in the intervening period from 2018 to 2023 (or until such a time that the N28 Upgrade is in place). Following the opening of the N28 Upgrade (assumed to be in 2023) the need to restrict HGVs generated by the proposed redevelopment during the AM and PM Peaks will be removed as the N28 Upgrade will increase the capacity of the road network serving the Ringaskiddy area significantly. However the implementation of the freight management and control system will continue as will the operation of the RMMP to support the efficient operation of the Port of Cork in Ringaskiddy well into the future.

It should be noted that the proposed redevelopment is not dependant on the N28 Upgrade for the early years of its operation (i.e. from 2018 to 2023). The RMMP will allow the Port to control HGVs entering the road network during the AM and PM commuter peaks however it will impose operational and logistical difficulties for the Port to continue to restrict HGV traffic during the AM and PM peaks, particularly beyond 2023. This is due to the ever greater number of HGVs that would be required to be distributed into the inter peak period particularly as Port operations continue to grow. The N28 Upgrade would, therefore, provide significant benefits to the proposed redevelopment and to the wider Ringaskiddy area in general.

A key aspect of the success of the RMMP will be monitoring of HGV volumes generated by the Port from its operation in Ringaskiddy. Annual monitoring and evaluation will ensure the continued success of the RMMP. This process will involve consultation with hauliers, freight forwarders and line agents and other stakeholders such as Cork County Council, Cork City Council, the NRA, the NTA and the local community. The results of this monitoring will be evaluated and the RMMP will be updated if required.

8.7.6.3 Benefit Provided by the N28 Upgrade

The provision of the N28 Upgrade will have significant benefits in terms of reducing traffic congestion along the existing N28 and for accessing the Ringaskiddy area. Further sensitivity assessments are undertaken using the PoCSTM, including a 2023 traffic modelled scenario to evaluate the impact on the surrounding strategic road network with the proposed redevelopment, with and without the N28 Upgrade in place. For the purposes of this EIS, it is assumed that the N28 Upgrade will be opened by 2023 and the 2023 traffic modelled scenario determines the benefits the N28 Upgrade will have on Port traffic, the existing N28 and to the requirements of the RMMP in terms of freight management during the AM and PM peaks from 2018 up to the opening of the N28 Upgrade. Traffic modelling indicates that, following the opening of the N28 Upgrade by 2023, journey times to the Ringaskiddy area will improve dramatically and that there will be a complete removal of congestion at locations such as Shanbally and Shannonpark, with average daily traffic levels reducing by over 60% at these locations. Furthermore, all strategic HGV traffic generated by the Port and other facilities in Ringaskiddy will use the N28 Upgrade.

8.7.6.4 Overall Conclusion

The traffic impact assessment on the proposed redevelopment of Ringaskiddy Port Redevelopment shows that congestion during the AM and PM peak commuter periods is the key issue for traffic operating along the existing N28. There is significantly more road capacity available outside these peak trafficked periods particularly in the Inter-Peak period between 09.00 and 17.00. In the intervening period between 2018 and 2023 (i.e. before the delivery of the N28 Upgrade which is assumed to be opened in 2023) the Port of Cork will use the RMMP to reduce freight movements generated by the Port at Ringaskiddy to Do Minimum levels during these AM and PM peaks. The RMMP provides the means for the Port of Cork to operate Phases 1 and 2 of the proposed

Ringaskiddy Port Reedevelopment without impacting on traffic congestion during peak periods by restricting HGV traffic during the AM and PM peaks until the N28 upgrade is in place.

Within the RMMP measures to manage freight during the AM and PM peaks coupled with the commitment not to make Phase 3 operational until the N28 Upgrade is open, the residual traffic impact will be insignificant.

The RMMP will also enable the Port to adapt to changing circumstance in an efficient and planned manner particularly with regard to the management of HGV traffic levels generated by the redevelopment well into the future. Importantly, the RMMP provides a sustainable means for the Port of Cork to grow by maximising the efficient use of the road infrastructure serving Ringaskiddy Port (and its other Port sites). Importantly, the RMMP supports the National Ports Policy in the context of ensuring efficient hinterland connections which are critically important to any Ports' ability to facilitate large volumes of trade.

Finally, the traffic impact assessment shows that the N28 Upgrade will have a significant beneficial impact on the long term movement of Port HGVs from Ringaskiddy and that the residual impacts of proposed redevelopment will be insignificant in terms of traffic impact post N28 Upgrade. The N28 Upgrade also provides significant benefits to the surrounding area in terms of improved accessibility to the area and in terms of significantly reducing traffic levels at locations such as Shanbally and Shannonpark.

9.0 NOISE AND VIBRATION

9.1 Introduction

This Chapter includes an assessment of the likely noise and vibration impacts associated with the proposed Ringaskiddy Port Redevelopment. Full details of the proposed redevelopment are included in Chapter 3 Project Description of the EIS and are not repeated in this Chapter.

Ringaskiddy Port is located in an area that contains a significant number of settlements. The nearest residential properties to the proposed Ringaskiddy Port Redevelopment works are the properties to the south of the existing N28 Main Street, properties to the west of the Port at Shanbally, properties to the northwest of the port at Monkstown and properties to the north and northeast at Cobh, Whitepoint and Blackpoint. In addition to the residential properties, there are other potentially noise sensitive receptors in the study area, including the National Maritime College of Ireland (NMCI), the Naval Base on Haulbowline Island and numerous schools, churches, clinics and leisure clubs.

The proposed redevelopment will be contained on the site of the existing Ringaskiddy Port, where there is an existing Deepwater Berth (DWB) and ferry service which operates during day and night-time periods. On account of this, there is a long history of noise from Port related activities in the vicinity of the proposed redevelopment. In addition to this, there are numerous existing industrial facilities located in the general study area. Road traffic noise is the dominant noise source in the vicinity of the majority of the nearest noise sensitive properties to the existing Port at Ringaskiddy.

During the construction phase of the proposed redevelopment, there is potential for noise impacts at the nearest noise sensitive properties from the use of noisy plant and equipment and vibration impacts from the use a certain construction phase activities (e.g. piling). The assessment of operational phase noise includes an assessment of the noise impact from new plant/equipment at the Port as a result of the proposed redevelopment and the assessment of road traffic changes in the vicinity of the Port as a result of the proposed redevelopment.

There are no statutory noise limits that can be applied to the assessment of noise and vibration impacts from planned developments in Ireland. The assessment of noise and vibration impacts has been completed on the basis of recognised Irish and international guideline documents in the areas of noise and vibration assessment. A key component of the assessment process has been to determine the likely noise and vibration impacts in the context of the existing noise and vibration environment at the nearest sensitive properties to the proposed redevelopment.

This Chapter should be read in conjunction with Figure 9.1 - 9.21. For figures not inserted directly into the text of this Chapter please refer to EIS Volume II - Figures. Appendix 9.1 (EIS Volume III a) gives a detailed breakdown of all measurements taken during the 24-hour noise measurement surveys and supplements the graphical presentations of the 24-hour surveys included in Appendix 9.2 (EIS Volume III a). Appendix 9.3 EIS (Volume III a) contains all of the attended short-term measurements completed as part of the baseline noise monitoring surveys.

9.2 Methodology

9.2.1 Noise Guidance Documents

This section includes a summary of Irish and international guidance documents that have been used as reference material for the purposes of completing the Noise and Vibration Assessment.

Environmental Protection Agency (EPA) Office of Environmental Enforcement (OEE) - Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

This document relates primarily to noise surveys and assessments for EPA licensed facilities but in the absence of any other directly applicable guidance documents, it provides useful reference material for the purposes of completing the noise assessment for the proposed Ringaskiddy Port Redevelopment project.

The EPA published two earlier documents in relation to the survey, assessment and management of noise emissions from licensed facilities, namely the *Environmental Noise Survey Guidance Document* (commonly referred to as NG1) and *Guidance Note for Noise in Relation to Scheduled Activities - 2nd Edition* (commonly referred to as NG2). These two documents have been withdrawn with the publication of NG4.

NG4 provides detailed consideration of a range of noise related issues including basic background to noise issues, various noise assessment criteria and procedures, noise reduction measures, Best Available Techniques (BAT) and the detailed requirements for noise surveys. NG4 provides typical limit values for noise from licensed sites, namely:

- Daytime (07:00 - 19:00) - 55dB $L_{Ar,T}$;
- Evening (19:00 - 23:00) - 50dB $L_{Ar,T}$:
- Night-time (23:00 - 07:00) - 45dB $L_{Aeq,T}$.

In the description of the limits above, the $L_{Aeq,T}$ is the equivalent continuous sound level over the measurement period and $L_{Ar,T}$ is equal to the L_{Aeq} but includes an additional penalty of 5dB(A) to account for any tonal or impulsive characteristics to the noise source.

While consideration is given to these threshold limits in the general context of the noise assessment for the proposed redevelopment, the proposed redevelopment is located in the context of an urban/suburban environment where existing noise levels regularly exceed the typical noise limits set out in NG4 for EPA licensed sites.

Other EPA guidelines such as *Guidelines on the Information to be Contained in Environmental Impact Statements [2002]* and *Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements) [2003]* have been considered also in the preparation of this Noise and Vibration Chapter.

National Roads Authority (NRA) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004)

This guidance document is primarily concerned with setting out the design criteria with regard to noise from new road schemes in Ireland, however it also provides useful reference material in terms of discussing suitable noise and vibration threshold limits for construction phase activities associated with road schemes in Ireland.

The NRA Guidelines list maximum permissible noise levels typically deemed to be acceptable for the construction phase of road schemes (See Table 9.1). These values are indicative only and more stringent limits may be applied where pre-existing noise levels are low.

Table 9.1: Maximum Permissible Noise Levels at the Façade of Dwellings During Construction

Days & Times	$L_{Aeq\ (1\ hr)}$ dB	$L_{pA(max)slow}$ dB
Monday to Friday 07:00 – 19:00hrs	70	80
Monday to Friday 19:00 – 22:00hrs	60*	65*
Saturday 08:00 – 16:30hrs	65	75
Sunday Bank Holidays 08:00 – 16:30hrs	60*	65*

* Construction activity at these times. Other than that required in respect of emergency works, will normally require explicit permission of the relevant local authority.

British Standard BS5228:2009 Noise and Vibration Control on Construction and open Sites

This British standard consists of two parts and covers the need for protection against noise and vibration of persons living and working in the vicinity of construction and open sites. The standard recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.

Part 1 of the standard provides a method of calculating noise from construction plant, including:

- Tables of source noise levels;
- Methods for summing up contributions from intermittently operating plant;
- A procedure for calculating noise propagation;
- A method for calculating noise screening effects; and
- A way of predicting noise from mobile plant, such as haul roads.

The standard also provides guidance on legislative background, community relations, training, nuisance, project supervision and control of noise and vibration.

The ABC method outlined in Section E3.2 has been used for the purposes of determining whether the predicted noise levels from the construction activities will result in any significant noise impact at the nearest noise sensitive properties.

Table 9.2 below outlines the applicable noise threshold limits that apply at the nearest noise sensitive receptors. The determination of what category to apply is dependent on the existing baseline ambient (L_{Aeq}) noise level (rounded to the nearest 5dB) at the nearest noise sensitive property. For daytime, if the ambient noise level is less than the Category A threshold limit, the Category A threshold limit (i.e. 65dB) applies. If the ambient noise level is the same as the Category A threshold limit, the Category B threshold limit (i.e. 70dB) applies. If the ambient noise level is more than the Category A threshold limit, the Category C threshold limit (i.e. 75dB) applies. The applicable limits that apply at each of the sensitive receptors included in the construction phase noise model are presented and discussed in section 9.4 of this Chapter.

Table 9.2: Noise Threshold Limits at Nearest Sensitive Receptors for Drilling Rig Activities

	Threshold Limits [dB(A)]		
	Category A	**Category B**	**Category C**
Night-time (23:00 - 07:00)	45	50	55
Evening and Weekends (19:00 - 23:00 Weekdays, 13:00-23:00 Saturdays, 07:00-23:00 Sundays)	55	60	65
Weekday daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

British Standard BS4142:1997 - Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas

BS4142: 1997 describes a method of determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. In general, the likelihood of complaint in response to a noise depends on factors including the margin by which it exceeds the background noise level, its absolute level, time of day, change in noise environment etc, as well as local attitudes to the premises and the nature of the neighbourhood.

The standard is a useful reference document for this assessment and aspects of the methodology and guidance within the document have been used for the purposes of completing the noise assessment for the proposed redevelopment.

World Health Organisation (WHO) - Guidelines for Community Noise

In 1999, the World Health Organisation (WHO) proposed guidelines for community noise. In this guidance, a L_{Aeq} threshold daytime noise limit of 55dB is suggested for outdoor living areas in order to protect the majority of people from being seriously annoyed. A second daytime limit of 50dB is also given as a threshold limit for moderate annoyance.

The guidelines suggest that an internal L_{Aeq} not greater than 30dB for continuous noise is needed to prevent negative effects on sleep. This is equivalent to a façade level of 45dB L_{Aeq}, assuming open windows or a free-field level of about 42dB L_{Aeq}. If the noise is not continuous, then the internal level required to prevent negative effects on sleep is a $L_{Amax,fast}$ of 45dB. Therefore, for sleep disturbance, the continuous level as well as the number of noisy events should be considered.

While consideration is given to these threshold limits in the general context of the noise assessment for the proposed redevelopment, the proposed redevelopment is located in the context of an urban/suburban environment where existing noise levels regularly exceed the typical noise limits set out in the WHO Guidelines.

World Health Organisation (WHO) - Night Noise Guidelines for Europe

The *Night Noise Guidelines for Europe* was published in 2009 on the back of extensive research completed by a WHO working group. Considering the scientific evidence on the threshold of night noise exposure indicated by $L_{night,outside}$ as defined in the Environmental Noise Directive (2002/49/EC), an $L_{night,outside}$ of 40dB should be the target of the night noise guideline (NNG) to protect public, including the most vulnerable groups such as children, the chronically ill and the elderly. An interim target of 55dB is recommended where the NNG cannot be achieved. These guidelines are applicable to Member States of the European Region and may be considered as an extension to the previous WHO Guidelines for Community Noise (1999). The guidelines do not expand on the noise limits applicable to non-continuous noise and hence the guidance included in the 1999 guidelines is still applicable in relation to this.

In the context of the existing environment in the vicinity of the proposed redevelopment, noise levels in the study area regularly exceed the 40dB night noise limit included in this document.

World Health Organisation (WHO) - Methodological Guidance for Estimating the Burden of Disease from Environmental Noise

In 2012, the WHO published the *Methodological Guidance for Estimating the Burden of Disease from Environmental Noise*. This document outlines the principles of quantitative assessment of the burden of disease from environmental noise, describes the status in terms of the implementation of the European Noise Directive and reviews evidence on exposure-response relationships between noise and cardiovascular diseases.

UK Department of Transport (Welsh Office) - Calculation of Road Traffic Noise [CRTN]

This Calculation of Road Traffic Noise (CRTN) guidance document outlines the procedures to be applied for calculating noise from road traffic. These procedures are necessary to enable entitlement under the Noise Insulation Regulations (NI) 1995 to be determined but they also provide guidance appropriate to the calculation of traffic noise for more general applications e.g. environmental appraisal of road schemes, highway design and land use planning.

The document consists of three different sections, covering a general method for predicting noise levels at a distance from a highway, additional procedures for more specific situations and a

measurement method for situations where the prediction method is not suitable. The prediction method constitutes the preferred calculation technique but in a small number of cases, traffic conditions may fall outside the scope of the prediction method and it will then be necessary to resort to measurement. The prediction method has been used in this instance to determine the likely traffic noise increases as a result of the proposed redevelopment.

Environmental Noise Directive (END) 2002/49/EC

END 2002/49/EC was transposed into Irish legislation in the form of the Environmental Noise Regulations, 2006. The legislation sets out the manner by which Strategic Noise Maps must be prepared in Ireland for large agglomerations, major roads, major railways and major airports. Strategic Noise Maps were prepared for the Cork Agglomeration in 2012 and a draft Noise Action Plan (NAP) was published for consultation.

The proposed redevelopment will alter the noise environment in the vicinity of Ringaskiddy Port and hence will alter the Strategic Noise Maps in this area. Under the requirements set out under END, the Strategic Noise Maps are required to be updated every five years. The changes brought about by the proposed redevelopment will be incorporated into the updated Strategic Noise Maps for the Cork Agglomeration as part of this ongoing update process.

9.2.2 EIS Informal Scoping and Consultation

Specific comments on noise issues related to the proposed redevelopment were received from the NRA and the Health Service Executive (HSE) - South, South Lee Environmental Health Department. A site visit to the existing Port was hosted for Kenneth Byrne, Senior Environmental Health Officer with the HSE - South. All comments relating to noise and vibration issues received as part of the consultation process were taken on board as part of the preparation of the Noise and Vibration Assessment included in this Chapter.

RPS acquired Port of Cork records for all complaints received by the Port in relation to noise issues over the past 5 years. This information was incorporated into the assessment included in this Chapter.

9.2.3 Vibration

The NRA *Guidelines for the Treatment of Noise & Vibration in National Road Schemes* is one of the few Irish guidance documents that gives recommendations relating to vibration from construction phase activities in Ireland. The guidelines recommend that vibration is limited to the values set out in Table 9.3 in order to ensure that there is little or no risk of even cosmetic damage to buildings. These values and the values indicated in Table 9.4 should be used as guidance for monitoring vibration levels from the construction phase of the proposed scheme.

Table 9.3: Recommended Vibration Level Thresholds for NRA Schemes

Allowable Vibration Velocity (Peak Particle Velocity) at the Closest Part of Any Sensitive Property to the Source of Vibration, at a Frequency of:		
Less than 10Hz	**10 to 50 Hz**	**50 to 100 Hz (and above)**
8mm/s	12.5mm/s	20mm/s

Limits of transient vibration, above which cosmetic damage could occur, are also given numerically in Table 9.4 (Ref: BS5228-2:2009). Minor damage is possible at vibration magnitudes which are greater than twice those given in Table 9.4, and major damage to a building structure can occur at values

greater than four times the tabulated values (definitions of the damage categories are presented in BS7385-1:1990, 9.9).

Table 9.4: Transient Vibration Guide Values for Cosmetic Damage (Ref BS5228-2:2009)

Type of Building	Peak Particle Velocity (PPV) (mm/s) in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/S at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above.

British Standard BS 7385 (1993) *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration* indicates that cosmetic damage should not occur to property if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz. These guidelines refer to relatively modern buildings and therefore, these values should reduced to 50% or less for more sensitive buildings.

The human body is an excellent detector of vibration, which can become perceptible at levels which are substantially lower than those required to cause building damage. The human body is most sensitive to vibration in the vertical direction (foot to head). The effect of vibration on humans is guided by British Standard 6472:1992. This standard does not give guidance on the limit of perceptibility, but it is generally accepted that vibration becomes perceptible at levels of approximately 0.15 to 0.3 mm/s.

BS 6472 defines base curves, in terms of rms acceleration, which are used to assess continuous vibration. Table 5 of the Standard states that in residential buildings, the base curve should be multiplied by 1.4 at night and by 2 to 4 during the daytime to provide magnitudes at which the probability of adverse comment is low.

In order to assess human exposure to vibration, ideally, measurements need to be undertaken at the point at which the vibration enters the body, i.e. measurements would need to be taken inside properties. However, various conversion factors have been established to convert vibration levels measured at a foundation to levels inside buildings, depending on the structure of the building.

Where vibration is intermittent or occurs as a series of events, the use of Vibration Dose Values (VDVs) is recommended in BS 6472 for the assessment of subjective response to vibration. The VDVs at which it is considered there will be a low probability of adverse comment are drawn from BS 6472 and presented in Table 9.5.

Table 9.5: Threshold Values for the Evaluation of Disturbance due to Vibration

Place	Daytime 16 Hour VDV ($ms^{-1.75}$)	Night-time 8 Hour VDV ($ms^{-1.75}$)
Critical working Area	0.11	0.09
Residential	0.22 – 0.43	0.13
Office	0.43	0.36[1]
Workshops	0.87	0.73

These VDV thresholds do not apply unless night-time work was a regular activity at these premises.

9.2.4 Methodology for Noise Monitoring

A number of different noise surveys were completed in order to gather the appropriate noise data for the purposes of completing the noise assessment. A baseline noise survey was completed involving unattended and attended noise measurements to record the existing noise environment at the nearest noise sensitive receptors to the proposed redevelopment. Two separate surveys were completed to

record the noise levels associated with a ferry arrival and a container vessel arrival and unloading sequence at the Port.

Nineteen noise monitoring locations were used for the baseline noise survey. The noise monitoring locations for the baseline survey and the Maersk container vessel survey are illustrated in Figure 9.1 (Volume II). For this survey, detailed unattended noise measurements were completed over a 24-hour period at each noise monitoring location. In addition to the 24-hour unattended surveys, short-term (i.e. 15-minute) noise measurements were also undertaken at each of the noise sensitive properties.

The baseline noise monitoring locations selected generally represent "worst-case" receptors in terms of sensitivity and proximity to the proposed Ringaskiddy Port Redevelopment site. A number of baseline noise monitoring locations/sensitive receptors were also selected at more remote locations from the proposed terminal site in order to establish existing noise levels across a good spread of the lower harbour area.

The noise monitoring was carried out using Bruel & Kjaer Model 2250 and 2260, Type 1 Integrating Digital Sound Level Meters (SLMs), capable of measuring within +/- 0.1dB(A) in L_{eq} and sound pressure levels (SPL) in 'A' scale. The instruments record the L_{Aeq}, L_{A10}, L_{A90}, L_{AMax} and L_{AMin} percentiles simultaneously. The instruments were calibrated in accordance with *ISO 1996 Acoustics - Description, Measurement and Assessment of Environmental Noise* and *BS4142 Method for Rating industrial noise affecting mixed Residential and Industrial areas* prior to commencing the surveys using the recommended standard calibration procedure and a known pure tone noise source. The units were again calibrated on completion of the surveys to record drift. The units had not drifted during the surveys. Drift is normally associated with battery fade and/or temperature.

Measurements were made at a height of 1.2 – 1.5m above ground level and under free field conditions. The weather conditions were in accordance with the requirements of *BS7445: Description and Measurement of Environmental Noise* and *ISO 1996: Acoustics - Description, Measurement and Assessment of Environmental Noise*.

The following parameters were recorded during each monitoring period:

L_{Aeq} The continuous equivalent A-weighted sound pressure level. This is an "average" of the sound pressure level.
L_{Amax} This is the maximum A-weighed sound level measured during the sample period.
L_{Amin} This is the minimum A-weighted sound level measured during the sample period.
L_{A10} This is the A-weighted sound level that is exceeded for noise for 10% of the sample period.
L_{A90} This is the A-weighted sound level that is exceeded for 90% of the sample period.

9.2.5 Noise Model

The proposed redevelopment was modelled using CadnaA noise modelling software. The CadnaA noise modelling software package uses the ISO9613 prediction methodology along with a range of topographical and ordnance data collected on the surrounding area to build up a picture of the noise environment in the vicinity of sensitive receptors in the study area. The software was used to build a 3-dimensional model of all features which may affect the generation and propagation of noise in the vicinity of the existing and proposed Port.

The CadnaA noise model was used for predicting cumulative noise levels at various stage of the construction phase and for predicting the cumulative noise levels from existing and proposed scenarios for the operational phase of the proposed redevelopment. The noise model was validated using noise measurement data recorded within the existing port during operational hours.

9.3 Existing Environment

9.3.1 Noise Survey at Nearest Sensitive Receptors

Noise monitoring was undertaken at 19 locations to determine the existing noise environment at the nearest noise sensitive properties. Noise monitoring at each location was conducted in the format of one 24-hour unattended measurement and short-term day and night-time attended measurements. The noise monitoring locations are illustrated in Figure 9.1 (EIS Volume II) and described in Table 9.6. Subjective observations were recorded during each of the short-term measurements.

Appendix 9.2 (EIS Volume III a) presents the noise graph for the ambient (i.e. L_{Aeq}) and background (i.e. L_{A90}) noise levels that were recorded at each of the noise monitoring locations for the 24-hour unattended measurements. The hourly noise measurements for each of these 24-hour measurement periods is included in the tables in Appendix 9.1 (EIS Volume III a). Appendix 9.3 (EIS Volume III a) includes details of all of the short-term noise measurements and associated subjective comments recorded at each of the noise monitoring locations.

Table 9.6: Description of Noise Monitoring Locations

Reference	Description of Noise Monitoring Locations
N1	Near entrance barrier to Naval college on Haulbowline Island.
N2	Northern boundary of the National Maritime College of Ireland, near the Fire Fighting Training Facility.
N3	Residential property near Rock Farm opposite existing car storage depot, Ringaskiddy Village.
N4	Row of residential properties elevated above main road in Ringaskiddy village overlooking existing entrance to Ferry Terminal, Ringaskiddy Village.
N5	Residential property near Community Centre in Ringaskiddy Village.
N6	Residential properties elevated above main road in Ringaskiddy village overlooking existing entrance to DWB, Ringaskiddy Village.
N7	Northwestern end of DWB, near landward end of former ADM jetty.
N8	Near shoreline of Monkstown Creek to west of former ADM jetty
N9	Residential property at southern end of Bellevue Place, Monkstown.
N10	Residential property just north of Bellevue Place, Monkstown.
N11	Residential property in Monkstown Castle Demesne adjacent to Monkstown Golf Course.
N12	Residential property at southern end of Alta Terrace, Monkstown, elevated above the R610.
N13	Residential property opposite Sand Quay, Monkstown.
N14	Residential property at northern end of Marine Villas, Monkstown.
N15	Residential property north of Blackpoint, just east of Cork Dockyard.
N16	Residential property immediately south of High Road and immediately north of railway line, near Wharton's Corner, Rushbrooke / Cobh.
N17	Residential property in the vicinity of Blackpoint
N18	Residential property at Whitepoint Drive near Cobh.
N19	Residential property located just north of Lower Road, overlooking Whitepoint Moorings, Cobh.

In general, the baseline noise monitoring survey illustrated that road traffic noise is the most dominant noise source at the majority of locations. This is supplemented to a greater or lesser extent by a

number of different noise sources including various industrial activities, the Port activities, various human activities and birdsong.

In Ringaskiddy, road traffic noise from the existing N28 road and the various local roads around the village was the dominant noise source. The influence of road traffic noise reduces as one travels from Ringaskiddy village out towards the NMCI and on to Haulbowline Island as various other noise sources contribute more to the overall ambient noise levels. A similar scenario prevails at Monkstown with road traffic noise from the R610 being the dominant source. Road traffic noise is dominant in Cobh also, however the further one travels from the main road links towards Whitepoint and Blackpoint, the influence of road traffic noise diminishes and the overall ambient noise is derived from multiple and varied sources.

9.3.2 Noise Surveys of Ferry and Container Vessels

On the morning of 20/07/13, a noise survey was conducted to record the noise levels associated with the arrival and activities of the Brittany Ferries vessel at Ringaskiddy Port. The purpose of the noise survey was to record the noise environment before and during the arrival of a ferry vessel and to record if there was any significant difference to the overall noise environment as a result of the ferry movements. Table 9.7 below includes a range of noise measurements taken between 08:40 to 16:25 which includes the activities associated with the ferry. The noise monitoring location for this survey was at the side of one of the internal Port roads which was in relative close proximity to the ferry landing point.

Table 9.7: Noise Survey of Brittany Ferries Activities at Ringaskiddy Port

Monitoring Time Period	L_{Aeq} dB(A)	L_{Amax} dB(A)	L_{Amin} dB(A)	L_{A10} dB(A)	L_{A90} dB(A)	Comments
08:40-08:50	57.7	78.0	42.5	60.3	50.5	Prior to ferry arrival. Birds (especially terns) prominent. Some ship cleaning. Car/HGV traffic.
08:54-09:04	58.7	79.2	42.6	60.0	49.4	Prior to ferry arrival. Birds (especially terns) prominent. HGV passing by and idling for short time.
09:22-09:32	64.1	91.3	42.3	66.7	46.3	Prior to ferry arrival. Birds (especially terns) prominent. HGV pass-by, horn and idle for short time.
09:38-09:48	61.7	85.2	49.5	62.9	53.1	Prior to ferry arrival. Birds (especially terns) prominent. On HGV pass-by.
09:48-09:58	62.3	77.0	56.9	63.4	59.7	Ferry Approach, idling and tannoy noise. Bird noise & HGV passing.
10:05-10:15	62.0	78.6	55.4	64.3	57.9	Ferry unloading. Ferry traffic. Bird noises.
10:18-10:28	63.5	74.0	59.8	64.9	61.6	Ferry unloading. Ferry traffic. Bird noises.
10:40-10:50	62.9	71.9	59.4	64.3	61.1	Ferry unloading. Ferry traffic. Bird noises.
13:45-13:55	60.0	75.3	52.7	61.8	55.2	Ferry idle. Bird noises, HGV traffic
13:58-14:08	63.0	76.2	53.7	64.4	56.5	Ferry idle. Bird noises, HGV traffic. Ferry start up and engine noise for approx 7.5 minutes of measurement.
14:12-14:22	63.4	74.4	58.6	64.6	61.0	Ferry loading. Bird noises and HGV movements. Ferry tannoy announcements.
14:45-14:55	63.0	75.3	58.6	64.4	60.7	Ferry loading. Bird noises and HGV movements. Ferry tannoy announcements.
16:04-16:14	59.1	63.2	56.8	60.2	57.9	Ferry idle and departure. Ferry tannoy. Ferry horn. Birds and HGV movements. Motorbike.
16:15-16:25	55.3	71.1	45.8	58.7	49.2	Ferry out of sight. Bird noises and HGV movements. Slight hum from moored vessel.

The noisiest early morning (i.e. night-time) activity at the existing Port in Ringaskiddy is the arrival and unloading of the Maersk container vessel once a week, generally on a Friday morning. On the morning the Maersk vessel arrives, activities commence at the Port at approximately 05.30 with the movement of the various mobile cranes and other relevant plant into position. Initially, only one mobile crane undertakes unloading activities in tandem with a reach stacker and the various terminal transporters and it is generally into the daytime hours (i.e. after 07.00) when the second mobile crane and associated reach stacker and terminal transporters are in full operation. Nevertheless, some of the most prominent noise sources from this activity, most notably the mobile crane movement alarms, are active during the night-time period (i.e. before 07.00).

In order the characterise the noise levels associated with the unloading of the Maersk vessel, a noise monitoring survey was undertaken on the morning of Friday 14th March 2014. Noise monitoring was undertaken at various locations around Ringaskiddy village, Monkstown and inside the Port itself adjacent to the unloading activities. Table 9.8 includes measured noise levels at various locations with all activities including alarm and container handling activities taking place at the Port.

Table 9.8: Noise Survey of Maersk Vessel Unloading - 14/03/14

Monitoring Time Period	L_{Aeq} dB(A)	L_{Amax} dB(A)	L_{Amin} dB(A)	L_{A10} dB(A)	L_{A90} dB(A)	Comments (Location in Figure 9.1, Volume II)
06:04 - 06:05	52.0	63.1	47.0	54.3	48.9	Location 1 - Ringaskiddy Village (R1)
06:05 - 06:06	49.4	53.1	47.2	51.1	47.7	Location 1 - Ringaskiddy Village (R1)
06:13 - 06:14	47.1	51.9	42.6	49.0	44.1	Location 2 - Ringaskiddy Village (R2)
06:16 - 06:17	55.2	67.4	43.8	59.6	46.1	Location 3 - Ringaskiddy Village (R3)
06:17 - 06:18	55.0	67.1	44.1	59.3	45.7	Location 3 - Ringaskiddy Village (R3)
06:23 - 06:24	53.9	67.7	40.1	58.7	42.6	Location 4 - Ringaskiddy Village (R4)
06:24 - 06:25	53.8	66.3	38.9	56.9	42.2	Location 4 - Ringaskiddy Village (R4)
06:29 - 06:30	51.1	58.8	40.1	54.7	42.9	Location 5 - Ringaskiddy Village (R5)
06:36 - 06:37	47.4	56.8	43.2	48.7	44.0	Location 6 - Ringaskiddy Village (R6)
06:37 - 06:38	54.1	65.8	44.0	56.7	45.1	Location 6 - Ringaskiddy Village (R6)
06:55 - 06:56	42.8	54.1	39.9	43.8	40.9	Location 1 - Monkstown (M1)
06:56 - 06:57	42.8	53.0	40.2	43.7	41.4	Location 1 - Monkstown (M1)
06:57 - 06:58	45.5	55.1	41.8	47.7	43.0	Location 1 - Monkstown (M1)
06:58 - 06:59	70.2	87.9	62.2	72.3	64.4	Location 1 - Ringaskiddy Port (P1)
07:30 - 07:31	69.0	79.0	62.5	72.3	64.0	Location 1 - Ringaskiddy Port (P1)
07:31 - 07:32	66.1	79.2	61.4	67.2	62.4	Location 1 - Ringaskiddy Port (P1)
07:32 - 07:33	64.3	70.9	61.6	65.8	62.9	Location 1 - Ringaskiddy Port (P1)
07:33 - 07:34	70.1	86.3	62.2	70.5	63.3	Location 1 - Ringaskiddy Port (P1)
07:34 - 07:35	68.4	73.9	65.9	70.4	66.6	Location 2 - Ringaskiddy Port (P2)
07:36 - 07:37	70.3	76.3	66.2	73.3	67.4	Location 2 - Ringaskiddy Port (P2)
07:37 - 07:38	70.9	79.5	66.4	73.0	67.5	Location 2 - Ringaskiddy Port (P2)
07:38 - 07:39	70.4	80.0	64.8	73.9	65.8	Location 2 - Ringaskiddy Port (P2)
07:39 - 07:40	73.4	81.1	69.8	75.3	71.4	Location 3 - Ringaskiddy Port (P3)
07:41 - 07:42	73.9	79.6	69.1	75.9	70.2	Location 3 - Ringaskiddy Port (P3)
07:42 - 07:43	75.4	86.5	69.0	78.8	70.0	Location 3 - Ringaskiddy Port (P3)
07:43 - 07:44	76.7	86.2	69.9	78.4	72.2	Location 3 - Ringaskiddy Port (P3)
07:44 - 07:45	75.3	81.5	70.4	78.3	72.2	Location 3 - Ringaskiddy Port (P3)

In terms of subjective observations, noise from the Port activities were audible at all locations in Ringaskiddy village with alarm noises and banging from container handling being the most prominent noise sources at all locations. Although the alarm noise and banging were audible, the Port noise was not the dominant noise source at any of the locations. For properties adjacent the existing N28 in the village, road traffic noise was clearly the most dominant noise source with Port noise becoming more audible in between car passing events. For locations behind the properties adjacent to the N28 road, birdsong was observed in real time to be the dominant noise source in terms of influencing the recorded noise level. In Monkstown, the noise from the Maersk unloading was barely audible with only the alarm noise being easily discerned (albeit quite faint) when no road traffic noise was passing on the R610.

9.4 Construction Phase Impacts

9.4.1 Construction Noise - General

A detailed noise model was created of the Port and surrounding noise sensitive receptors in order to predict the cumulative noise level associated with construction phase activities at the nearest noise sensitive properties. In order to create the noise model, it was necessary to define the various plant and equipment used as part of the construction phase activities. Table 9.9 includes a list of the most significant plant/equipment to be used during the construction phase for the proposed redevelopment.

Table 9.9: Plant and Equipment to be Used During Construction Phase (Ref: BS5228:2009)

Activity / Plant (Reference from Annex C & D, BS5228:2009)	Power Rating (kW)	Equipment Size, Weight (Mass), Capacity	Sound Power Level (dB)
Breaking Road Surface: Mini Excavator with Hydraulic Breaker (C5 - Ref 2)	-	1.5t	111
Road Planing: Road Planer (C5 - Ref 7)	185	17t	110
Removing Broken Road Surface: Wheeled Excavator (C5 - Ref 11)	112	17t	101
Rolling and Compaction: Vibratory roller (C5 - Ref 27)	20	3t	95
Haulage: Road Lorry - Full (C6 - Ref 21)	270	39t	108
Lifting: Wheeled Mobile Telescopic Crane (C4 - Ref 38)	610	400t	106
Clearing Site: Tracked excavator (C2 - Ref 3)	102	22t	106
Clearing Site: Wheeled backhoe loader (C2 - Ref 8)	62	8t	96
Ground Excavation: Dozer (C2 - Ref 12)	142	20t	109
Ground Excavation: Tracked excavator (C2 - Ref 14)	226	40t	107
Ground Excavation: Wheeled loader (C2 - Ref 27)	193	-	108
Poker Vibrator (C4 - Ref 33)	-	-	106
Power: Diesel Generator (C4 - Ref 83)	3	210kg	93
Distribution of Material: Tipper Lorry (C8 - Ref 20)	-	-	107
Piling: Tubular Steel Piling - hydraulic hammer - (C3 - Ref 3)	-	240mm diameter	116
Piling: Sheet Steel Piling - hydraulic jacking - power pack (C3 - Ref 10)	147	6t	96
Pumping Water: Water pump (C2 - Ref 45)	20	6 in	93
Dredging: Ship Chain Bucket (D12 - Ref 1)*	-	35m long	124

* BS5228:2009 has no reference for the specific drill and blast technique and therefore the noisiest dredging technique from BS5229:2009 has been used as reference.

In order to predict the worst-case noise levels associated with the overall construction phase, three separate stages of the construction phase have been selected so as to represent the worst-case stages of the construction process where the most items of plant/equipment are active simultaneously in areas that are in closest proximity to the nearest noise sensitive properties. These worst-case construction scenarios are described under the headings included in the bullet points below:

- Construction Scenario 1: Activities include excavation/fill/surfacing of Port entrance, internal road works, bunds/armouring and bulk fill and piling at Paddy's Point, dredging and piling on quay walls of CB / MPB;
- Construction Scenario 2: Activities include piling, anchor wall works, capping beam works, bunds/armouring, bulk fill, crane foundations, deck slab piling and deck slab works to the CB / MPB quay walls and works to the RTG foundations;
- Construction Scenario 3: Activities include piling, anchor walls, bulk fill, capping beam works, crane foundations, deck slab piling and deck slab works to DWB extension.

The plant and equipment requirements for each of the construction scenarios are detailed below on the basis of the activities included in the paragraph above. The noise model for each of these scenarios assumes to all of the items of plant/equipment for each scenario is active simultaneously.

Construction Scenario 1: Excavator with breaker, road planer, wheeled excavator (road works), vibratory roller, haulage lorry for road works, tubular steel and steel sheet piling rigs x 2 (Paddy's Point and LB/MFB Quay Wall), dredger, mobile crane (for rock armour work), excavator (for rock armour work) and lorry (for rock armour work).

Construction Scenario 2: Mobile crane x 5 (piling, anchor wall, capping beam, crane foundations, deck slab works), tubular steel and steel sheet piling rigs x 3 (quay wall, anchor wall and deck slab works), excavator x 3 (quay wall piling, anchor wall and bulk filling), tipper lorry x 2 (capping beam and bulk filling), compressor x 3 (capping beam works, crane foundation and deck slab works), poker x 2 (capping beam works and deck slab works) and dozer (bulk filling).

Construction Scenario 3: Mobile crane x 5 (piling, anchor wall, capping beam, crane foundations, deck slab works), tubular steel and steel sheet piling rigs x 3 (quay wall, anchor wall and deck slab works), excavator x 3 (quay wall piling, anchor wall and bulk filling), tipper lorry x 2 (capping beam and bulk filling), compressor x 3 (capping beam works, crane foundation and deck slab works), poker x 2 (capping beam works and deck slab works) and dozer (bulk filling).

9.4.2 Predicted Impact of Construction Noise from Proposed Redevelopment

Where construction activity takes place for a development in the vicinity of residential properties, it is standard practice that the activities would operate between the hours of 08:00 and 18:00 on Monday to Fridays, between 08:00 and 13:00 on Saturdays and there will be no activity on Sundays or Bank Holidays.

The construction scenarios (1-3) detailed in section 9.4.1 are worst-case stages of the construction phase where the greatest number of items of plant/equipment will operate at the closest distance to the nearest noise sensitive properties. These scenarios are very much worst-case scenarios and in reality they represent an over-estimation of the likely construction phase noise impacts associated with the proposed redevelopment at any one time.

While there are a significant number of sensitive receptors in the vicinity of the proposed activities that have the potential to be impacted by construction phase noise associated with the proposed redevelopment, they are generally grouped together in three approximate areas in relation to the Port, namely:

- South of the Port, along and south of the existing N28 Main Street;
- North west of the Port in Monkstown; and
- North and North East of the Port in Cobh and the surrounding areas.

There are hundreds of receptors in each of these general areas and rather than include all of these, a select number of receptors have been selected and included in the noise model. These select number of receptors are representative of those properties that are nearest to the proposed works and most likely to be impacted by the proposed construction phase activities. These properties are also representative of the properties adjacent to them but not included in the noise model. Some representative properties that are a little further away from the proposed redevelopment are also included in the model to illustrate the decreasing noise impact with distance from the proposed

redevelopment. Table 9.10 includes the worst-case predicted noise levels for Construction Scenarios 1 - 3. The locations of the receptors included in the tables below are illustrated in Figures 9.2, 9.3 and 9.4 (EIS Volume II) that accompany this Chapter.

Table 9.10: Worst-Case Predicted Construction Noise Levels at Nearest Noise Sensitive Properties from Construction Scenario 1

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)	Predicted Worst-Case Construction Noise (dBA)		
		Scenario 1	Scenario 2	Scenario 3
1	Naval Base, Haulbowline Island	41.4	37.4	33.1
2	National Maritime College of Ireland	57.3	37.4	34.1
3	Detached dwelling on L2545	41.8	42.6	38.0
4	Rock Farm, Martello Park	42.2	43.6	38.7
5	Detached dwelling, Martello Park	42.3	44.1	39.1
6	1 Martello Park	43.0	44.7	39.6
7	9 Martello Park	41.4	42.3	36.2
8	Church at Shamrock Place	43.7	44.0	38.3
9	1 St. Joseph's Terrace	42.6	41.8	36.8
10	2A Main St	44.5	45.6	38.8
11	7 Main St	44.7	45.8	39.0
12	13 Main St	45.0	46.4	40.9
13	Ferry Boat Inn, Main St	45.2	47.2	41.7
14	Reamur, Old Post Office Road	42.7	42.9	38.0
15	Thornberry, Old Post Office Road	40.0	39.7	36.2
16	Sun View, Old Post Office Road	38.6	38.5	35.3
17	Island View, Main St	46.5	47.9	42.2
18	Sheen House, Main St	49.7	48.9	42.3
19	Roughty House, Main St	50.3	49.1	42.3
20	Bay Tree House, Main St	50.8	49.2	43.5
21	Allenvale, Main St	50.8	49.3	43.7
22	26 Ferry View	46.7	47.2	39.7
23	Leeview, Main St	54.7	49.7	44.1
24	4 Riverview	57.5	49.7	43.9
25	2 Main St	59.9	49.6	43.8
26	Lackendarra, Main St	64.0	49.7	43.7
27	Drouch Na Mara, Warren's Court	49.7	45.2	40.4
28	Robin Hill, R610	33.1	37.3	41.3
29	Ardnaree, Strand Road	32.6	39.4	44.5
30	Ivy Cottage, Strand Road	32.5	39.5	44.7
31	Dwelling, Bayview Cottages, Strand Road	32.2	39.7	44.9
32	2 Strand Road	31.9	39.9	45.0
33	The Lodge, Strand Road	31.4	38.8	43.6
34	5 Belle Vue Place	31.5	39.7	44.6
35	14 Belle Vue Place	31.2	39.7	44.2
36	Grants Cottage, Strand View	31.6	39.6	43.8
37	Fir Hill House, Strand Road	30.4	38.9	43.0
38	Detached dwelling, The Demense	29.4	37.5	41.1
39	Summerland, Strand Road	31.2	39.4	43.2
40	Crowery, Alta Terrace	30.9	39.3	42.7
41	Thorncliffe, Alta Terrace	30.7	39.1	42.2
42	1 Alta Terrace	30.1	38.3	41.2
43	Rinnacoltaigh House, Rinacoltig	32.1	39.7	38.3
44	Travara, Rinacoltig	34.4	41.3	39.7
45	Cooleen House, Rinacoltig	35.0	43.1	40.6
46	Coolgrena House, Rinacoltig	34.6	42.2	38.7
47	Detached dwelling, Rinacoltig	34.7	41.7	38.0
48	17 Whitepoint Estate	34.3	40.4	37.5

49	13 Whitepoint Estate	35.3	40.2	37.3
50	1 Whitepoint Estate	36.1	39.5	36.5
51	38 Whitepoint Estate	32.4	37.3	35.1
52	Woodville, Whitepoint Park	32.9	36.7	34.4
53	21 Whitepoint Moorings	33.7	35.3	33.0

Table 9.10 illustrates the worst-case predicted cumulative construction noise levels at the nearest noise sensitive receptors at three different stages of the construction process. These worst-case predicted noise levels have been calculated on the basis that all items of plant/equipment are at the nearest point of their usage to the respective noise sensitive property. They have also been completed on the basis of the predicted noise level at the first floor bedroom window (i.e. 4m) at the nearest noise sensitive property.

In order to determine the noise impact associated with the worst-case predicted construction noise levels included in Table 9.29, the predicted noise levels have been compared to the permissible construction noise levels included in the NRA Guidelines (see Table 9.1) and the derived threshold noise limits using the ABC Method from BS5228:2009 (see Table 9.2). Tables 9.11 - 9.13 illustrate whether the worst-case predicted construction noise levels are within the respective noise threshold limits outlined in the NRA Guidelines and BS5228:2009.

Table 9.11: Comparison of Worst-Case Predicted Construction Noise Levels from Scenario 1 with Noise Threshold Limits in NRA Guidelines (2004) and BS5229:2009

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)	Scenario 1	Noise Threshold Limit (L_{Aeq}) (dBA)	
			NRA Guidelines	BS5228:2009 ABC Method
1	Naval Base, Haulbowline Island	41.4	70	65
2	National Maritime College of Ireland	57.3	70	65
3	Detached dwelling on L2545	41.8	70	65
4	Rock Farm, Martello Park	42.2	70	65
5	Detached dwelling, Martello Park	42.3	70	65
6	1 Martello Park	43.0	70	65
7	9 Martello Park	41.4	70	65
8	Church at Shamrock Place	43.7	70	65
9	1 St. Joseph's Terrace	42.6	70	65
10	2A Main St	44.5	70	65
11	7 Main St	44.7	70	65
12	13 Main St	45.0	70	65
13	Ferry Boat Inn, Main St	45.2	70	65
14	Reamur, Old Post Office Road	42.7	70	65
15	Thornberry, Old Post Office Road	40.0	70	65
16	Sun View, Old Post Office Road	38.6	70	65
17	Island View, Main St	46.5	70	65
18	Sheen House, Main St	49.7	70	65
19	Roughty House, Main St	50.3	70	65
20	Bay Tree House, Main St	50.8	70	65
21	Allenvale, Main St	50.8	70	65
22	26 Ferry View	46.7	70	65
23	Leeview, Main St	54.7	70	65
24	4 Riverview	57.5	70	65
25	2 Main St	59.9	70	65
26	Lackendarra, Main St	64.0	70	65
27	Drouch Na Mara, Warren's Court	49.7	70	65
28	Robin Hill, R610	33.1	70	65
29	Ardnaree, Strand Road	32.6	70	65
30	Ivy Cottage, Strand Road	32.5	70	65
31	Dwelling, Bayview Cottages, Strand Road	32.2	70	65

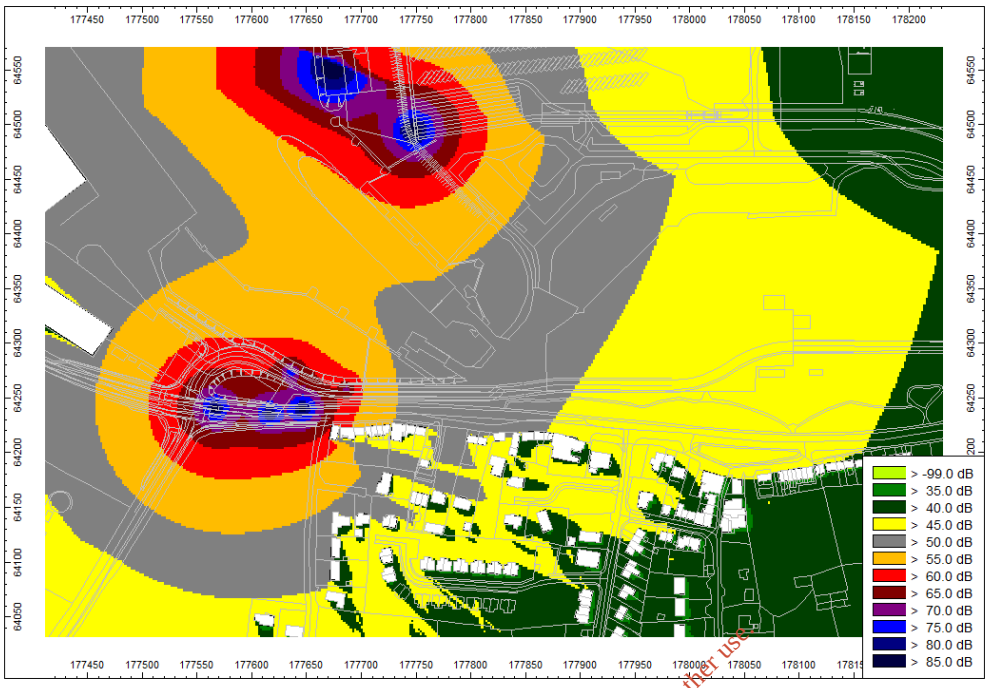
32	2 Strand Road	31.9	70	65
33	The Lodge, Strand Road	31.4	70	65
34	5 Belle Vue Place	31.5	70	65
35	14 Belle Vue Place	31.2	70	65
36	Grants Cottage, Strand View	31.6	70	65
37	Fir Hill House, Strand Road	30.4	70	65
38	Detached dwelling, The Demense	29.4	70	65
39	Summerland, Strand Road	31.2	70	65
40	Crowery, Alta Terrace	30.9	70	65
41	Thorncliffe, Alta Terrace	30.7	70	65
42	1 Alta Terrace	30.1	70	65
43	Rinnacoltaigh House, Rinacoltig	32.1	70	65
44	Travara, Rinacoltig	34.4	70	65
45	Cooleen House, Rinacoltig	35.0	70	65
46	Coolgrena House, Rinacoltig	34.6	70	65
47	Detached dwelling, Rinacoltig	34.7	70	65
48	17 Whitepoint Estate	34.3	70	65
49	13 Whitepoint Estate	35.3	70	65
50	1 Whitepoint Estate	36.1	70	65
51	38 Whitepoint Estate	32.4	70	65
52	Woodville, Whitepoint Park	32.9	70	65
53	21 Whitepoint Moorings	33.7	70	65

Table 9.11 illustrates that the worst-case predicted noise levels from Construction Scenario 1 are within the maximum permissible noise threshold limits include in the NRA Guidelines for construction phase activities and within the applicable daytime limit outlined in the BS5228:2009 ABC Method. A number of the nearest properties to the Port entrance (i.e. receptors 23-26, Figure 9.2 - Volume II) will experience worst-case predicted noise levels in the 60-65dB range on account of the proximity of the road works in this area to these properties, but these noise levels will only be experienced for a short time while activities are at their nearest point to these properties. Other than the properties adjacent to the Port entrance road works, all of the nearest properties will experience worst-case predicted noise levels that are well within the NRA and BS5228:2009 threshold levels discussed above.

At the Naval Base, worst-case predicted noise levels from Scenario 1 (i.e. 41.4dB) are similar to the background noise levels measured during the day in this area (L_{A90} - approximately 40dB) and well below the ambient noise level (L_{Aeq} - 50-65dB). The construction phase activities during this phase will have no significant impact at the Naval Base. The worst-case predicted noise levels from this scenario at the NMCI (i.e. 57.3dB) will be above the measured ambient noise levels in this location (L_{Aeq} - 40 - 55dB) and above the background noise levels (L_{A90} - 40-50dB). This is predominantly as a result of the construction works proposed at Paddy's Point. An increase in noise levels will be experienced at the college while works at Paddy's Point are being progressed.

In terms of Ringaskiddy village, existing ambient noise levels are in the range of 50 - 60dB L_{Aeq} throughout the village, although background noise levels tend to be higher on the western portion of the village (L_{A90} - 40 - 55dB) when compared with the eastern portion (L_{A90} - 35 - 45dB). Worst-case predicted noise levels for this scenario (i.e. low 40sdB) are similar to the existing background noise level in the eastern part of the village and well below the ambient noise level. In the western portion of the village, the majority of properties will experience worst-case predicted noise levels similar to the background noise level (i.e. 45 - 50dB) and below the existing ambient noise levels. The only exception to this will be the properties that are immediately adjacent to the Port entrance road works (i.e. receptors 23-26, Figure 9.2 - EIS Volume II) which will experience noise levels in the 60-65dB range. Figure 9.5 includes an illustration of the model output in the vicinity of these properties and demonstrates how ambient noise levels will be elevated in the vicinity of these properties while worst-case construction phase activities take place in close proximity to them.

Figure 9.5: Noise Model Output of Scenario 1 in the Vicinity of the Port Entrance



In Monkstown, worst-case predicted noise levels from this scenario will be in the low 30sdB (see receptors 28-42 in Table 9.11 and Figure 9.3 – EIS Volume II), which is well below existing ambient noise levels at properties adjacent to the R610 (L_{Aeq} - 50 - 60dB) and below ambient noise levels for properties set back from the R610 (L_{Aeq} - 40 - 50dB). These worst-case predicted noise levels are also below the background noise levels at properties adjacent to the R610 (L_{A90} - 40 - 50dB) and properties set back from the R610 (L_{A90} - 35 - 50dB). There will be no significant construction phase noise impact from this scenario at any properties in the Monkstown area.

Worst-case predicted noise levels from this scenario will be in the range of 30 - 35dB at all properties in the area of Whitepoint / Blackpoint and south of the R624 (see receptors 43 - 53 in Table 9.11 and Figure 9.4 – EIS Volume II). Existing ambient noise levels are in the range of 40 - 55dB in this area while background noise levels are in the range of 40 - 50dB. On this basis, the worst-case predicted noise levels will be well below existing background noise levels and there will be no significant noise impact from this phase of construction in this area.

Overall, Construction Scenario 1 will only result in a significant noise increase at the properties adjacent to the Port entrance road works (i.e. receptors 23-26, Figure 9.2 – EIS Volume II) and at the NMCI on account of the works at Paddy's Point. The noise level increases in these areas will be within the noise threshold limits outlined in the NRA Guidelines and BS5228:2009, nevertheless all measures should be employed during the construction phase activities in these areas to reduce construction noise levels to the lowest possible levels. Mitigation measures aimed at reducing construction phase noise levels are outlined in section 9.5 of the Chapter.

Table 9.12: Comparison of Worst-Case Predicted Construction Noise Levels from Scenario 2 with Noise Threshold Limits in NRA Guidelines (2004) and BS5229:2009

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)	Scenario 2	Noise Threshold Limit (L_{Aeq}) (dBA)	
			NRA Guidelines	BS5228:2009 ABC Method
1	Naval Base, Haulbowline Island	37.4	70	65
2	National Maritime College of Ireland	37.4	70	65
3	Detached dwelling on L2545	42.6	70	65
4	Rock Farm, Martello Park	43.6	70	65
5	Detached dwelling, Martello Park	44.1	70	65
6	1 Martello Park	44.7	70	65
7	9 Martello Park	42.3	70	65
8	Church at Shamrock Place	44.0	70	65
9	1 St. Joseph's Terrace	41.8	70	65
10	2A Main St	45.6	70	65
11	7 Main St	45.8	70	65
12	13 Main St	46.4	70	65
13	Ferry Boat Inn, Main St	47.2	70	65
14	Reamur, Old Post Office Road	42.9	70	65
15	Thornberry, Old Post Office Road	39.7	70	65
16	Sun View, Old Post Office Road	38.5	70	65
17	Island View, Main St	47.9	70	65
18	Sheen House, Main St	48.9	70	65
19	Roughty House, Main St	49.1	70	65
20	Bay Tree House, Main St	49.2	70	65
21	Allenvale, Main St	49.3	70	65
22	26 Ferry View	47.2	70	65
23	Leeview, Main St	49.7	70	65
24	4 Riverview	49.7	70	65
25	2 Main St	49.6	70	65
26	Lackendarra, Main St	49.7	70	65
27	Drouch Na Mara, Warren's Court	45.2	70	65
28	Robin Hill, R610	37.3	70	65
29	Ardnaree, Strand Road	39.4	70	65
30	Ivy Cottage, Strand Road	39.5	70	65
31	Dwelling, Bayview Cottages, Strand Road	39.7	70	65
32	2 Strand Road	39.9	70	65
33	The Lodge, Strand Road	38.8	70	65
34	5 Belle Vue Place	39.7	70	65
35	14 Belle Vue Place	39.7	70	65
36	Grants Cottage, Strand View	39.6	70	65
37	Fir Hill House, Strand Road	38.9	70	65
38	Detached dwelling, The Demense	37.5	70	65
39	Summerland, Strand Road	39.4	70	65
40	Crowery, Alta Terrace	39.3	70	65
41	Thorncliffe, Alta Terrace	39.1	70	65
42	1 Alta Terrace	38.3	70	65
43	Rinnacoltaigh House, Rinacoltig	39.7	70	65
44	Travara, Rinacoltig	41.3	70	65
45	Cooleen House, Rinacoltig	43.1	70	65
46	Coolgrena House, Rinacoltig	42.2	70	65
47	Detached dwelling, Rinacoltig	41.7	70	65
48	17 Whitepoint Estate	40.4	70	65
49	13 Whitepoint Estate	40.2	70	65
50	1 Whitepoint Estate	39.5	70	65
51	38 Whitepoint Estate	37.3	70	65

52	Woodville, Whitepoint Park	36.7	70	65
53	21 Whitepoint Moorings	35.3	70	65

Table 9.12 illustrates that the worst-case predicted noise levels from Construction Scenario 2 are well within the maximum permissible noise threshold limits include in the NRA Guidelines for construction phase activities and within the applicable daytime limit outlined in the BS5228:2009 ABC Method.

At the Naval Base, worst-case predicted noise levels from Scenario 2 (i.e. 37.4dB) are lower than the background noise levels measured during the day in this area (L_{A90} - approximately 40dB) and well below the ambient noise level (L_{Aeq} - 50-65dB). The construction phase activities during this phase will have no significant impact at the Naval Base. The worst-case predicted noise levels from this scenario at the NMCI (i.e. 37.4dB) will be below the measured ambient noise levels in this location (L_{Aeq} - 40 - 55dB) and the background noise levels (L_{A90} - 40-50dB). There will be no noise impact from this phase of construction at the college.

In Ringaskiddy village, existing ambient noise levels are in the range of 50 - 60dB L_{Aeq} throughout the village, although background noise levels tend to be higher on the western portion of the village (L_{A90} - 40 - 55dB) when compared with the eastern portion (L_{A90} - 35 - 45dB). Worst-case predicted noise levels for this scenario (i.e. low-mid 40sdB) are similar to the existing background noise level in the eastern part of the village and well below the ambient noise level. In the western portion of the village, all of the nearest properties will experience worst-case predicted noise levels similar to the background noise level (i.e. 45 - 50dB) and below the existing ambient noise levels.`

In Monkstown, worst-case predicted noise levels from this scenario will be in the range of 35-40dB (see receptors 28-42 in Table 9.12 and Figure 9.3 - EIS Volume II), which is well below existing ambient noise levels at properties adjacent to the R610 (L_{Aeq} - 50 - 60dB) and below ambient noise levels for properties set back from the R610 (L_{Aeq} - 40 - 50dB). These worst-case predicted noise levels are also below the background noise levels at properties adjacent to the R610 (L_{A90} - 40 - 50dB) and similar to the lowest background noise levels recorded at properties set back from the R610 (L_{A90} - 35 - 50dB). There will be no significant construction phase noise impact from this scenario at any properties in the Monkstown area.

Worst-case predicted noise levels from this scenario will be in the range of 35 - 43dB at all properties in the area of Whitepoint - Blackpoint and south of the R624. Existing ambient noise levels are in the range of 40 - 55dB in this area while background noise levels are in the range of 40 - 50dB. On this basis, the worst-case predicted noise levels will be well below or similar to existing background noise levels recorded in this area and therefore there will be no significant noise impact from this phase of construction in this area.

Overall, Construction Scenario 2 will not result in any significant increase in noise levels at any of the nearest noise sensitive properties. Nevertheless all measures should be employed during the construction phase activities in these areas to reduce construction noise levels to the lowest possible levels. Mitigation measures aimed at reducing construction phase noise levels are outlined in section 9.5 of the Chapter.

Table 9.13: Comparison of Worst-Case Predicted Construction Noise Levels from Scenario 3 with Noise Threshold Limits in NRA Guidelines (2004) and BS5229:2009

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)	Scenario 3	Noise Threshold Limit (L_{Aeq}) (dBA)	
			NRA Guidelines	BS5228:2009 ABC Method
1	Naval Base, Haulbowline Island	33.1	70	65
2	National Maritime College of Ireland	34.1	70	65
3	Detached dwelling on L2545	38.0	70	65
4	Rock Farm, Martello Park	38.7	70	65
5	Detached dwelling, Martello Park	39.1	70	65
6	1 Martello Park	39.6	70	65
7	9 Martello Park	36.2	70	65
8	Church at Shamrock Place	38.3	70	65
9	1 St. Joseph's Terrace	36.8	70	65
10	2A Main St	38.8	70	65
11	7 Main St	39.0	70	65
12	13 Main St	40.9	70	65
13	Ferry Boat Inn, Main St	41.7	70	65
14	Reamur, Old Post Office Road	38.0	70	65
15	Thornberry, Old Post Office Road	36.2	70	65
16	Sun View, Old Post Office Road	35.3	70	65
17	Island View, Main St	42.2	70	65
18	Sheen House, Main St	42.3	70	65
19	Roughty House, Main St	42.3	70	65
20	Bay Tree House, Main St	43.5	70	65
21	Allenvale, Main St	43.7	70	65
22	26 Ferry View	39.7	70	65
23	Leeview, Main St	44.1	70	65
24	4 Riverview	43.9	70	65
25	2 Main St	43.8	70	65
26	Lackendarra, Main St	43.7	70	65
27	Drouch Na Mara, Warren's Court	40.4	70	65
28	Robin Hill, R610	41.3	70	65
29	Ardnaree, Strand Road	44.5	70	65
30	Ivy Cottage, Strand Road	44.7	70	65
31	Dwelling, Bayview Cottages, Strand Road	44.9	70	65
32	2 Strand Road	45.0	70	65
33	The Lodge, Strand Road	43.6	70	65
34	5 Belle Vue Place	44.6	70	65
35	14 Belle Vue Place	44.2	70	65
36	Grants Cottage, Strand View	43.8	70	65
37	Fir Hill House, Strand Road	43.0	70	65
38	Detached dwelling, The Demense	41.1	70	65
39	Summerland, Strand Road	43.2	70	65
40	Crowery, Alta Terrace	42.7	70	65
41	Thorncliffe, Alta Terrace	42.2	70	65
42	1 Alta Terrace	41.2	70	65
43	Rinnacoltaigh House, Rinacoltig	38.3	70	65
44	Travara, Rinacoltig	39.7	70	65
45	Cooleen House, Rinacoltig	40.6	70	65
46	Coolgrena House, Rinacoltig	38.7	70	65
47	Detached dwelling, Rinacoltig	38.0	70	65
48	17 Whitepoint Estate	37.5	70	65
49	13 Whitepoint Estate	37.3	70	65
50	1 Whitepoint Estate	36.5	70	65
51	38 Whitepoint Estate	35.1	70	65

52	Woodville, Whitepoint Park	34.4	70	65
53	21 Whitepoint Moorings	33.0	70	65

Table 9.13 illustrates that the worst-case predicted noise levels from Construction Scenario 3 are well within the maximum permissible noise threshold limits include in the NRA Guidelines for construction phase activities and within the applicable daytime limit outlined in the BS5228:2009 ABC Method.

At the Naval Base, worst-case predicted noise levels from Scenario 3 (i.e. 33.1dB) are well below the background noise levels measured during the day in this area (L_{A90} - approximately 40dB) and well below the ambient noise level (L_{Aeq} - 50-65dB). The construction phase activities during this phase will have no significant impact at the Naval Base. The worst-case predicted noise levels from this scenario at the NMCI (i.e. 34.1dB) will also be well below the measured ambient noise levels in this location (L_{Aeq} - 40 - 55dB) and the background noise levels (L_{A90} - 40-50dB).

In Ringaskiddy village, existing ambient noise levels are in the range of 50 - 60dB L_{Aeq} throughout the village, although background noise levels tend to be higher on the western portion of the village (L_{A90} - 40 - 55dB) when compared with the eastern portion (L_{A90} - 35 - 45dB). Worst-case predicted noise levels for this scenario (i.e. 35-40dB) are similar to the existing background noise level in the eastern part of the village and well below the ambient noise level. In the western portion of the village, all properties will experience worst-case predicted noise levels similar to or lower than the background noise level (i.e. 45 - 50dB) and below the existing ambient noise levels.

In Monkstown, worst-case predicted noise levels from this scenario will be in the 40 - 45dB range (see receptors 28-42 in Table 9.13 and Figure 9.3 - EIS Volume II), which is below existing ambient noise levels at properties adjacent to the R610 (L_{Aeq} - 50 - 60dB) and below or similar to ambient noise levels for properties set back from the R610 (L_{Aeq} - 40 - 50dB). These worst-case predicted noise levels are in a similar range to the background noise levels recorded at properties adjacent to the R610 (L_{A90} - 40 - 50dB) and at properties set back from the R610 (L_{A90} - 35 - 50dB). There will be no significant construction phase noise impact from this scenario at any properties in the Monkstown area.

Worst-case predicted noise levels from this scenario will be in the range of 33 - 41dB at all properties in the area of Whitepoint / Blackpoint and south of the R624. Existing ambient noise levels are in the range of 40 - 55dB in this area while background noise levels are in the range of 40 - 50dB. On this basis, the worst-case predicted noise levels will be below or similar to existing background noise levels recorded in this area and therefore there will be no significant noise impact from this phase of construction in this area.

Overall, Construction Scenario 3 will not result in any significant increase in noise levels at any of the nearest noise sensitive properties. Nevertheless all measures should be employed during the construction phase activities in these areas to reduce construction noise levels to the lowest possible levels. Mitigation measures aimed at reducing construction phase noise levels are outlined in section 9.5 of the Chapter.

9.4.3 Construction Phase Traffic Impacts

During the construction phase for the proposed redevelopment, worst-case traffic flow increases for all road links except for two links, will be less than 5%. The two road links where traffic flow increases will be greater than 5% are the N28 west of R613 (+ 6.3%) and the N28 east of Shanbally (+5.1%).

The UK Design Manual for Roads and Bridges (DMRB, Volume 11, Section 3, Part 7) states that it takes a 25% increase or a 20% decrease in traffic flows in order to get a 1dB(A) change in traffic noise levels. On this basis, traffic noise levels associated with the construction phase of the proposed redevelopment will be significantly less than 1dB(A). It is generally accepted that it takes an approximate 3dB(A) increase in noise levels to be perceptible to the average person (Ref: NRA *Guidelines for the Treatment of Noise and Vibration in National Road Scheme,* 2004). Based on this reference, traffic noise increases associated with the construction phase on the local road network will be imperceptible.

9.4.4 Construction Phase Vibration Impacts

Some of the construction phase activities associated with the proposed construction phase have the potential to result in vibration impacts at sensitive receptors if sufficiently close to the respective receptor. Activities included in the proposed construction phase that have the potential to result in vibration impacts include piling and to a lesser extent rock armour activities and dredging.

BS5228:2009 Code of Practice for Noise and Vibration Control on Construction and open Sites - Part 2: Vibration gives pages of reference data relating to measured vibration levels associated with different types of piling activities in different ground strata. BS5228:2009 references vibration levels measured for various types of bored piling / cast-in-situ piling (using hammer), a technique which reflects the type of piling that will be conducted as part of the proposed redevelopment.

Reference 11 from Table D1 of BS5228:2009 indicates that bored piling on loose rock over weathered rock over rock, gives a measured PPV of 1.2mm/s at 30m. The nearest piling activity associated with the proposed redevelopment will be between the CB / MPB in Ringaskiddy East and the properties on the N28 Main Street (distance - 250m) and between the piling works at Paddy's Point and the NMCI (distance - 140m).

Using the reference included in BS5228:2009, the worst-case vibration levels from the proposed construction works will be significantly less than 1mm/s, which is substantially below the vibration threshold limits outlined in Tables 9.3 and 9.4. On the basis of the discussion included above, there will be no significant vibration impact associated with the construction phase of the proposed redevelopment.

9.5 Operational Phase Impacts

9.5.1 Noise Impact from Deepwater Berth (DWB) extension

This section includes an assessment of the potential noise impact associated with the addition of new plant/equipment associated with the proposed extension to the DWB. Currently, there are three mobile cranes, two rail mounted grab cranes (electrical), three hoppers, two reach stackers and numerous terminal transporters operating on the existing DWB during busy periods. The proposed redevelopment will extend the length of the DWB and will potentially introduce one additional mobile crane and one additional hopper at some point in the future.

On account of the potential increase in the use of plant/equipment in the future and the fact that the area of operation on the DWB may extend by some distance, a comparative noise modelling exercise was completed using CadnaA noise modelling software to determine the likely noise impact associated with the addition of a mobile crane and a hopper at the redeveloped DWB.

The operation of a fourth mobile crane and hopper will only occur on limited occasions when particularly large vessels are docked at the berth or when a number of vessels will be docked at the berth. This will only occur during daytime hours. The comparative noise modelling exercise illustrated that the addition of an extra mobile crane and hopper on the DWB will result in minor noise level increases in the vicinity of Ringaskiddy village (i.e. <1dB[A]) and Whitepoint/Blackpoint (1-2dB[A]).

The most significant effects from this additional plant at the DWB will be an increase in the noise levels of 2-5dB(A) at noise sensitive receptors in Monkstown. However, these increased noise levels from the DWB activity will not result in any significant alteration to the daytime noise levels experienced at sensitive receptors in Monkstown as there are significantly below the existing ambient noise levels measured at Monkstown as part of the baseline noise monitoring survey (EIS Volume III - Appendices 9.1 to 9.3).

In summary, the changes to the DWB as a result of the proposed redevelopment have the potential to increase noise levels from the DWB to a minor/moderate extent during worst-case scenario. However, as these increases are significantly below existing daytime ambient noise levels at the nearest noise

sensitive properties, there will be no significant noise level increases as a result of these changes at the nearest noise sensitive properties.

9.5.2 Noise Impact from the Proposed Container Berth/Multi-purpose Berth (CB/MPB)

This section includes an assessment of the potential noise impact associated with the addition of new plant/equipment to the proposed site as a result of the new CB / MPB at Ringaskiddy East.

The proposed redevelopment will result in the creation of a new CB / MPB. In terms noise emitting plant/equipment, all of the plant/equipment operating at the proposed CB / MPB will be new plant/equipment to the Port.

Table 9.14 includes reference data for the various plant and equipment that will operate on the proposed CB / MPB. The data for each item of plant/equipment has been taken from a number of different sources including the SourcedB database (EU Imagine Project), the Dublin Port EFFORTS Study and detailed plant specification sheets.

Table 9.14: Source Noise Data Used in Noise Model for the Proposed CB / MPB

Item of Plant/Equipment	Sound Power Level (L_W) dB(A)
Ship	101.5
Ship to Shore Gantry (SSG) Crane	97.0
Rubber Tyre Gantry (RTG) Crane	97.0
Reefer container	90.6
Reach Stacker (LRS 645)	104.5
Terminal Transporter	103.8
Mobile Crane (LHM 550)	106.4
SSG/RTG/Mobile Crane Alarm/Beacon	116.0*
Container Handling Activity	112.0*

* Additional 5dB has been added to these Lw Noise Levels to account for tonal/impulsive nature

In Table 9.14, an entry has been included for general container handling noise, which has been included in the noise model in addition to the plant noise from the various items of plant that will be handling the containers. This noise level was taken from direct measurements completed as part of the Dublin Port EFFORTS Study and has been included here in order to incorporate the various banging noises associated with container handling. The noise level for the container handling noise has been increased by 5dB(A) as a penalty to account of the impulsive nature of this noise (i.e. 107dB + 5dB = 112dB).

Also, in addition to the plant noise for the various crane sources used in the noise model, an alarm/beacon noise source has also been included in the model. This has also been increased by 5dB in order to account for the tonal quality associated with this noise source (i.e. 111dB = 5dB = 116dB).

For the proposed operational phase, two different scenarios were modelled for day and night-time periods and these are detailed in the bullet points included below:

- Scenario 1 - Daytime: proposed CB / MPB operating at 100% capacity with 3 ships, 2 SSG cranes, 1 mobile crane, 6 RTG cranes, 2 reach stackers, 12 terminal transporters and reefer noise active simultaneously. This option includes two simultaneous container handling events (L_W -112dB) to account for bangs from terminal containers being moved and two alarms/beacons (Lw - 116dB) being active simultaneously;
- Scenario 2 - Night-time: proposed CB / MPB operating with 1 ship, 1 SSG crane, 2 RTG cranes, 1 reach stacker, 4 terminal transporters and reefer noise active simultaneously. This option includes two simultaneous container handling events (L_W -112dB) to account for bangs from terminal containers being moved and two alarms/beacons (Lw - 116dB) being active simultaneously;

Table 9.15 contains the predicted noise levels for Scenarios 1-2 as described above. The nearest noise sensitive properties listed in the table are the same as those used for the construction phase noise assessment and are illustrated in Figures 9.2 - 9.4 (EIS Volume II). All predicted noise levels are at a height of 4m to reflect the height of a first floor window.

Table 9.15: Noise Model Predictions of Proposed Operational Phase Noise from Activities at CB / MPB

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)	Predicted Operational Phase Noise from Proposed CB / MPB (dBA)		
		Scenario 1 (Day)	Scenario 2 (Night)	Scenario 2 (No Alarm)
1	Naval Base, Haulbowline Island	43.4	42.3	38.4
2	National Maritime College of Ireland	44.3	43.1	38.9
3	Detached dwelling on L2545	49.5	48.5	42.9
4	Rock Farm, Martello Park	50.5	49.6	43.9
5	Detached dwelling, Martello Park	51.1	50.1	44.4
6	1 Martello Park	51.7	50.8	45.0
7	9 Martello Park	49.2	48.1	43.6
8	Church at Shamrock Place	52.3	51.4	45.6
9	1 St. Joseph's Terrace	49.0	47.8	43.8
10	2A Main St	52.8	51.9	46.0
11	7 Main St	53.1	52.1	46.1
12	13 Main St	53.4	52.4	46.3
13	Ferry Boat Inn, Main St	54.1	53.1	46.9
14	Reamur, Old Post Office Road	48.5	48.5	43.7
15	Thornberry, Old Post Office Road	45.1	44.2	40.1
16	Sun View, Old Post Office Road	43.9	43.0	39.1
17	Island View, Main St	54.8	53.8	47.5
18	Sheen House, Main St	55.7	54.6	48.0
19	Roughty House, Main St	55.9	54.8	48.1
20	Bay Tree House, Main St	56.0	54.8	48.1
21	Allenvale, Main St	56.0	54.8	48.0
22	26 Ferry View	51.0	49.7	45.5
23	Leeview, Main St	56.2	54.9	48.1
24	4 Riverview	56.0	54.7	48.0
25	2 Main St	55.8	54.6	47.9
26	Lackendarra, Main St	55.8	54.6	47.9
27	Drouch Na Mara, Warren's Court	52.1	51.3	44.6
28	Robin Hill, R610	42.9	42.4	35.4
29	Ardnaree, Strand Road	43.6	43.0	36.0
30	Ivy Cottage, Strand Road	43.7	43.2	36.2
31	Dwelling, Bayview Cottages, Strand Road	43.9	43.3	36.3
32	2 Strand Road	44.0	43.5	36.5
33	The Lodge, Strand Road	43.1	42.5	35.7
34	5 Belle Vue Place	43.9	43.3	36.4
35	14 Belle Vue Place	43.9	43.3	36.5
36	Grants Cottage, Strand View	43.8	43.3	36.4
37	Fir Hill House, Strand Road	43.2	42.7	35.9
38	Detached dwelling, The Demense	42.0	41.4	34.9
39	Summerland, Strand Road	43.6	43.1	36.2
40	Crowery, Alta Terrace	43.5	43.0	36.1
41	Thorncliffe, Alta Terrace	43.4	42.8	36.0
42	1 Alta Terrace	43.0	42.4	35.7
43	Rinnacoltaigh House, Rinacoltig	46.1	45.4	38.8
44	Travara, Rinacoltig	45.3	45.4	39.5
45	Cooleen House, Rinacoltig	48.2	47.5	40.9
46	Coolgrena House, Rinacoltig	47.4	46.6	40.1

47	Detached dwelling, Rinacoltig	47.2	46.4	39.9
48	17 Whitepoint Estate	47.1	46.3	39.8
49	13 Whitepoint Estate	47.0	46.2	39.7
50	1 Whitepoint Estate	46.5	45.7	39.3
51	38 Whitepoint Estate	42.0	41.0	37.0
52	Woodville, Whitepoint Park	41.5	40.6	36.7
53	21 Whitepoint Moorings	40.2	39.2	35.3

The modelled noise levels included in Table 9.15 demonstrate that there is potential for noise impacts at some of the nearest noise sensitive properties to the proposed redevelopment. Figures 9.6 - 9.8 illustrate the daytime noise contours from the proposed redevelopment in the vicinity Ringaskiddy village, Monkstown and Whitepoint / Blackpoint. Figures 9.9 - 9.11 illustrate the night-time noise contours at the same locations, while Figures 9.12 - 9.14 illustrate the night-time noise contours without the alarm/beacon noise.

Figure 9.6: Noise Contours for Daytime Operation at Ringaskiddy Village

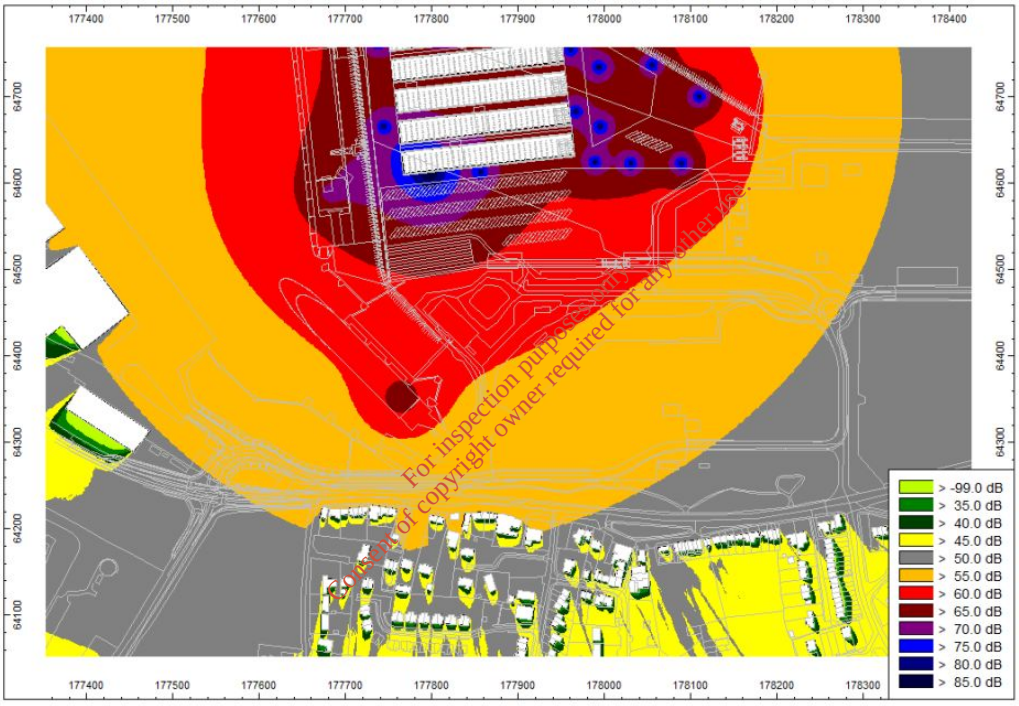


Figure 9.7: Noise Contours for Daytime Operation at Monkstown

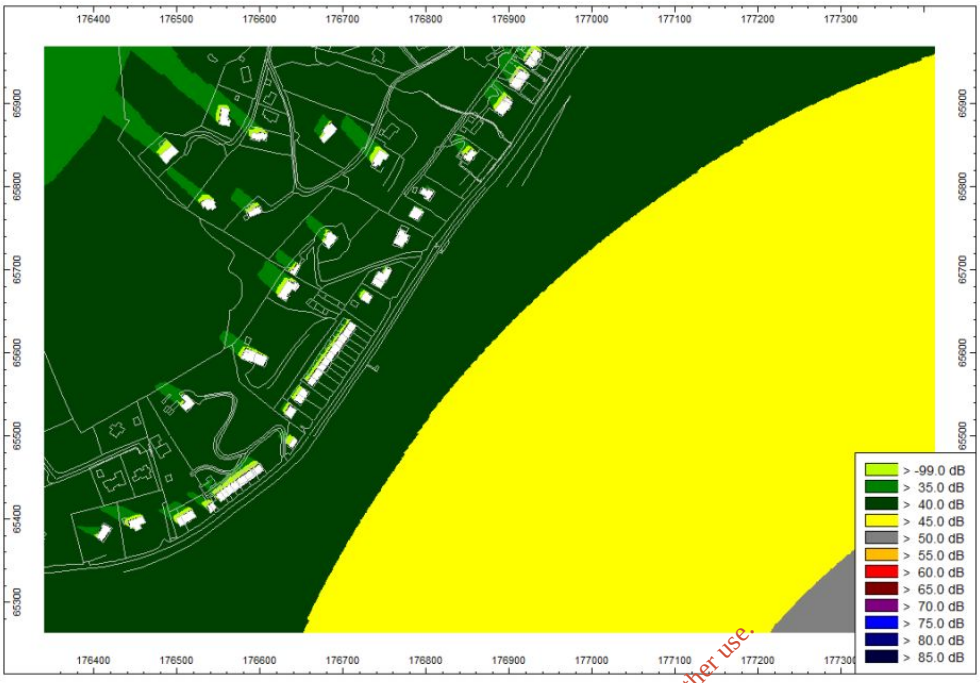


Figure 9.8: Noise Contours for Daytime Operation at Whitepoint / Blackpoint

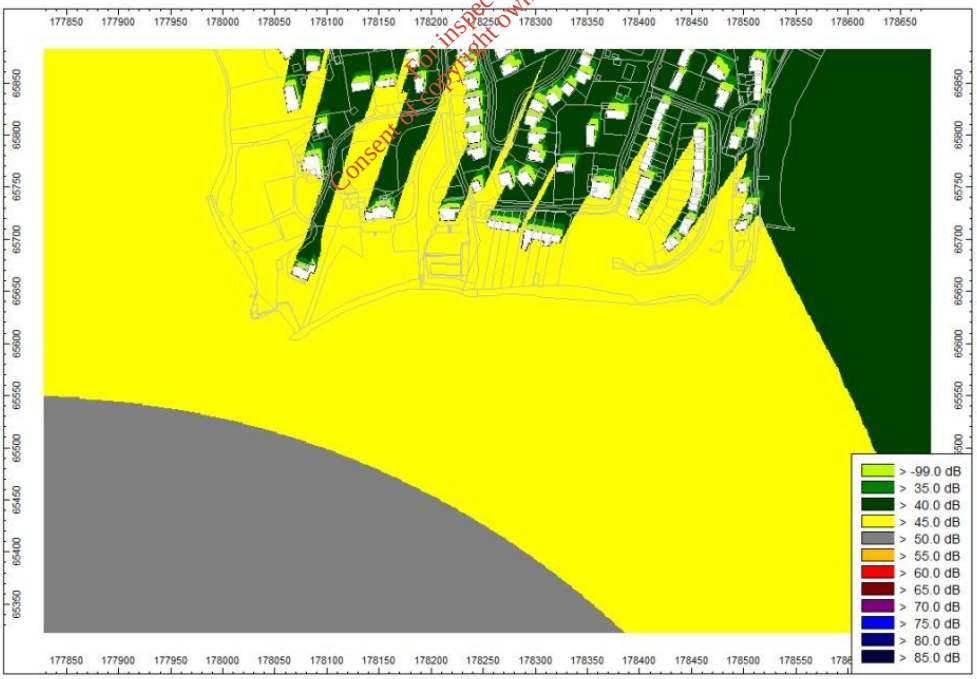


Figure 9.9: Noise Contours for Night-time Operation (Including Alarms) at Ringaskiddy Village

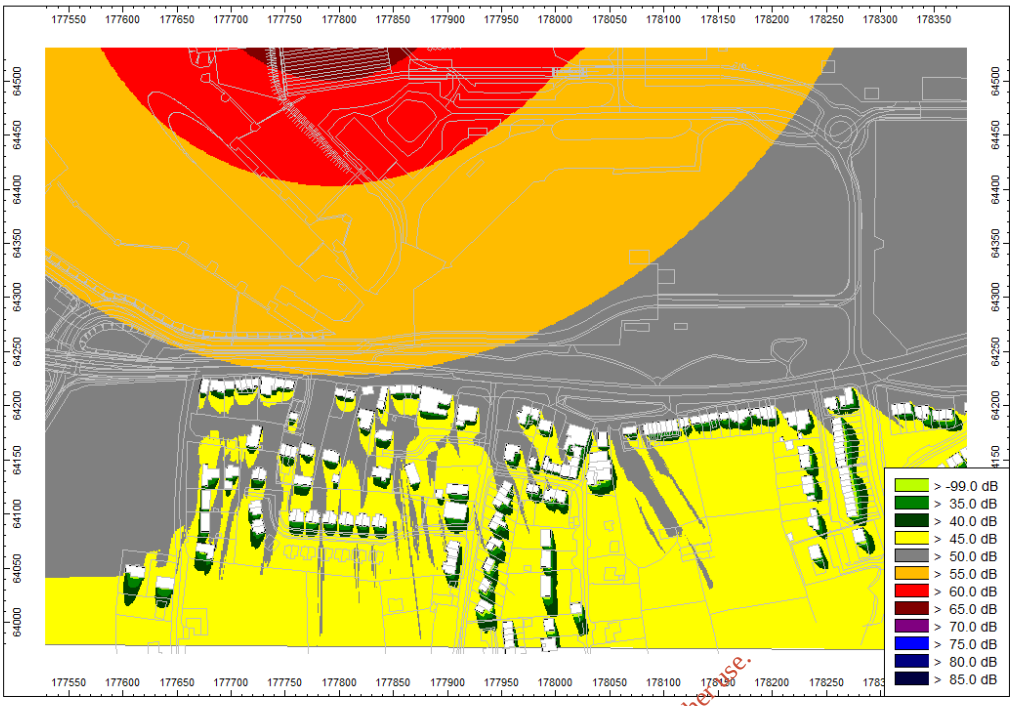


Figure 9.10: Noise Contours for Night-time Operation (Including Alarms) at Monkstown

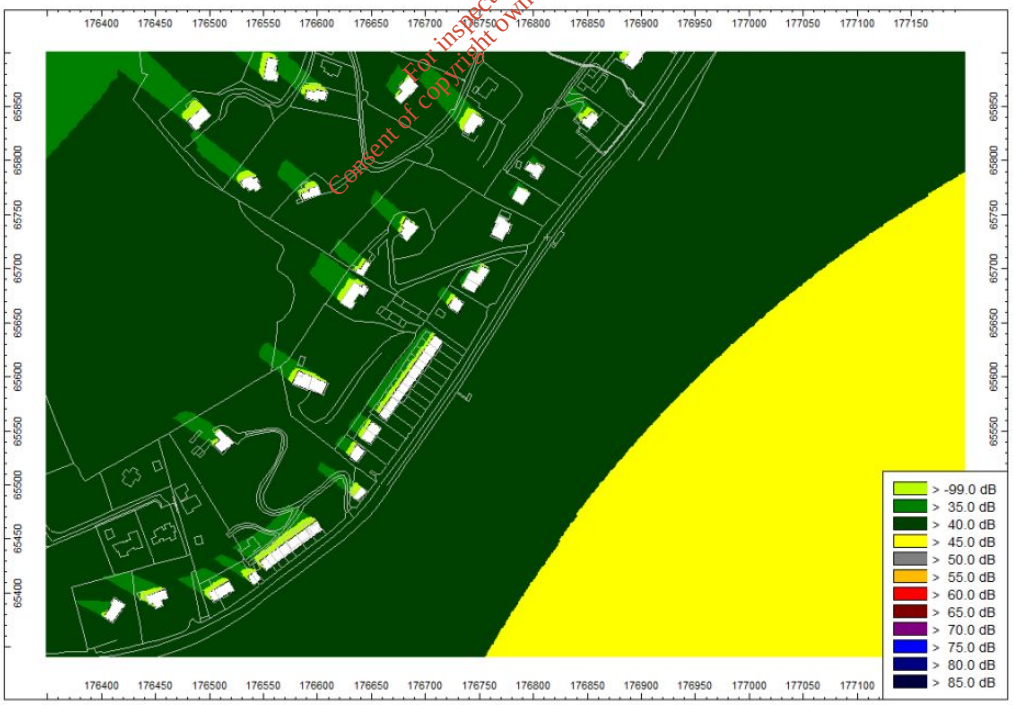


Figure 9.11: Noise Contours for Night-time Operation (Including Alarms) at Whitepoint / Blackpoint

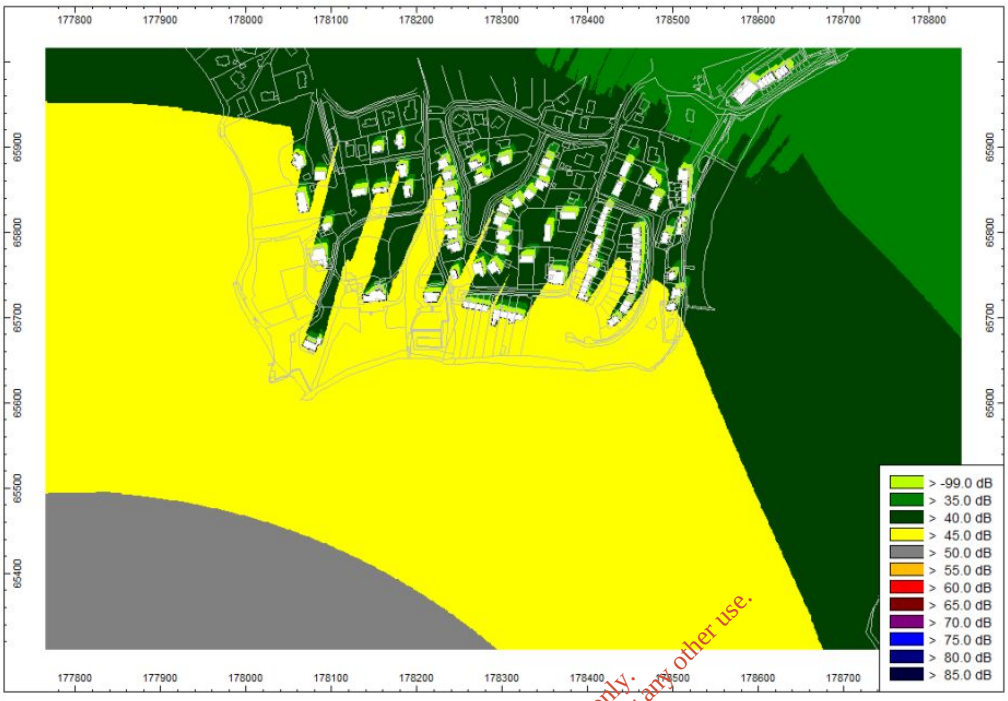


Figure 9.12: Noise Contours for Night-time Operation at Ringaskiddy (No Alarm)

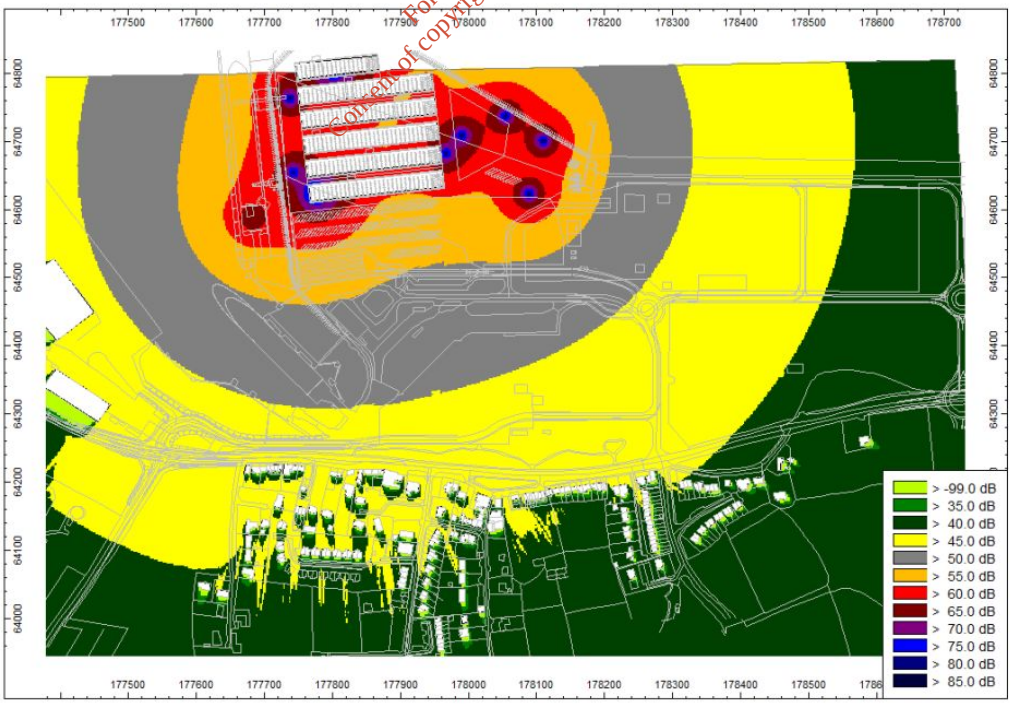


Figure 9.13: Noise Contours for Night-time Operation at Monkstown (No Alarm)

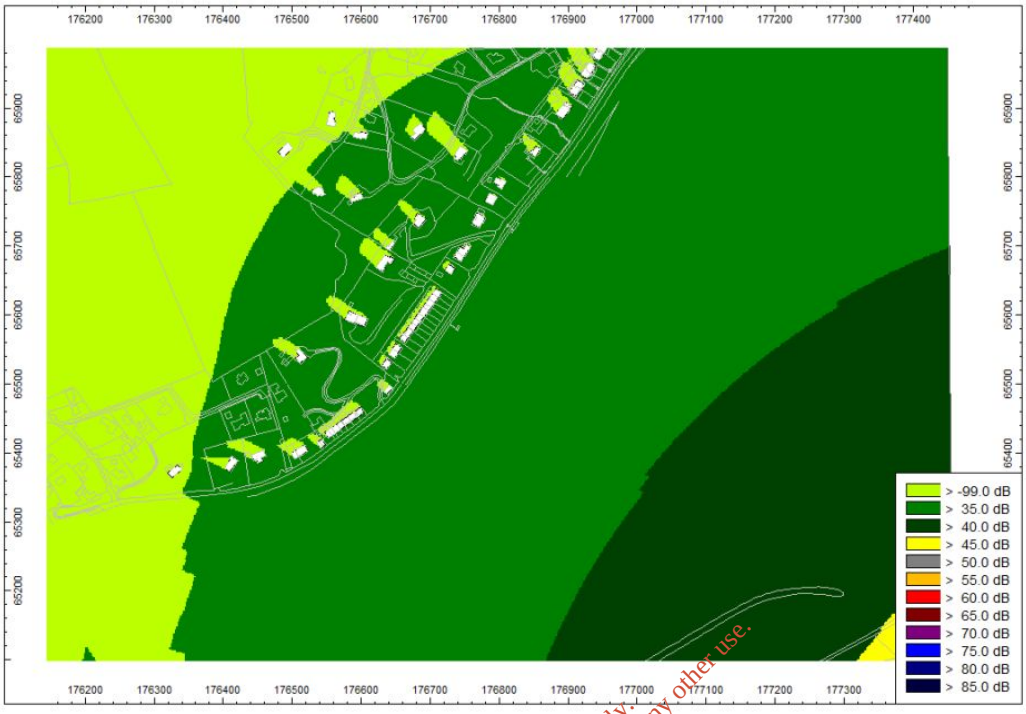


Figure 9.14: Noise Contours for Night-time Operation at Whitepoint / Blackpoint (No Alarm)

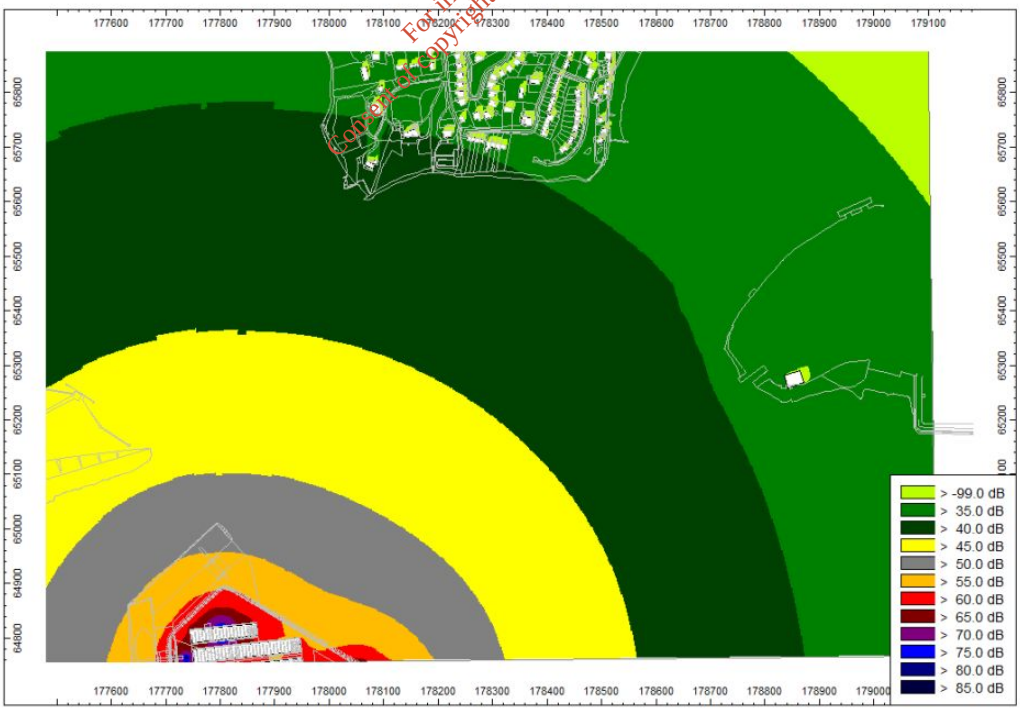


Table 9.16 presents the worst-case predicted daytime noise levels at the proposed CB / MPB with the existing ambient and background daytime noise levels recorded at the nearest noise sensitive properties. A noisy reference sound power level has been used for the alarm/beacon noise from the site plant and with the additional of a 5dB penalty to account for the tonal nature of this noise (i.e. Lw 111dB + 5dB = 116dB), the alarm/beacon noise is a very dominant feature in the predicted noise levels from the proposed site. As the alarm/beacon noise is not a continuous noise source from the proposed site, the predicted noise level from the proposed CB / MPB without alarm noise is also included in the table in brackets.

Table 9.16: Predicted Daytime Noise Levels from Proposed CB / MPB and Existing Noise Levels at Nearest Noise Sensitive Properties

Property Reference (Fig 9.2-9.4, Vol. II)	Existing Daytime Ambient L_{Aeq} dB(A)	Existing Daytime Background L_{A90} dB(A)	Worst-Case Predicted Noise Levels - Day (No Alarm) L_{Aeq} dB(A)
1	50-64	40	43.4 (40.5)
2	40-56	40-50	44.3 (41.4)
3	50-56	35-45	49.5 (45.4)
4	51-60	35-45	50.5 (46.6)
5	51-60	35-45	51.1 (47.1)
6	51-60	35-45	51.7 (47.7)
7	51-60	35-45	49.2 (46.1)
8	51-60	35-45	52.3 (48.4)
9	51-60	35-45	49.0 (46.3)
10	51-60	35-45	52.8 (48.8)
11	51-60	35-45	53.1 (49.0)
12	51-56	35-45	53.4 (49.3)
13	51-56	35-45	54.1 (49.9)
14	51-56	35-45	48.5 (45.7)
15	-	-	45.1 (42.0)
16	-	-	43.9 (41.1)
17	51-56	40-55	54.8 (50.5)
18	51-56	40-55	55.7 (51.6)
19	51-56	40-55	55.9 (51.9)
20	54-58	40-55	56.0 (52.1)
21	54-58	40-55	56.0 (52.2)
22	51-56	40-55	51.0 (48.4)
23	54-58	40-55	56.2 (52.5)
24	54-58	40-55	56.0 (52.2)
25	54-58	40-55	55.8 (51.9)
26	54-58	40-55	55.8 (51.8)
27	-	-	52.1 (47.6)
28	54-60	40-50	42.9 (37.7)
29	54-60	40-50	43.6 (38.5)
30	54-60	40-50	43.7 (38.6)
31	54-60	40-50	43.9 (38.8)
32	54-60	40-50	44.0 (38.9)
33	44-52	35-50	43.1 (38.1)
34	52-68	40-50	43.9 (38.8)
35	52-68	40-50	43.9 (38.9)
36	52-68	40-50	43.8 (38.8)
37	44-52	35-50	43.2 (38.3)
38	44-52	35-50	42.0 (37.3)
39	53-56	40-50	43.6 (38.6)
40	53-56	40-50	43.5 (38.5)
41	53-56	40-50	43.4 (38.4)
42	50-55	40-50	43.0 (38.0)
43	45-49	40-50	46.1 (41.4)

44	46-52	40-50	45.3 (41.7)
45	46-52	40-50	48.2 (43.5)
46	46-52	40-50	47.4 (42.7)
47	46-52	40-50	47.2 (42.5)
48	42-50	40-50	47.1 (42.4)
49	42-50	40-50	47.0 (42.3)
50	42-50	40-50	46.5 (41.9)
51	46-53	40-50	42.0 (39.1)
52	42-50	40-50	41.5 (38.5)
53	46-53	40-50	40.2 (37.3)

In the vicinity of the Naval Base and the NMCI, worst-case predicted daytime noise levels are below or at the lower end of the range of daytime ambient noise levels. With the alarm noise, worst-case predicted noise levels are approximately 3-4dB above the background noise level at the Naval Base and in the middle of the range of existing background noise measured at the NMCI. Without the alarm noise, the worst-case predicted noise levels are similar to the background noise levels at the Naval Base and at the bottom of the range of measured background noise levels at the NMCI.

Aside from the alarm noise, these worst-case predicted noise levels are based on all items of plant being active simultaneously in the proposed CB / MPB and the model has included additional noise sources other than the actual plant itself to account for container handling noises (including a 5dB penalty for tonal/impulsive activities). On this basis and considering the existing measured ambient and background noise levels, noise levels from the proposed CB / MPB will not be the dominant noise source in the vicinity of the Naval Base or the NMCI during the day. The noise will contribute to the background noise levels at these locations and at particular times when activities are at full capacity (including alarm noise), the noise from the proposed CB / MPB will be an audible contributor to the background noise levels in these locations.

In Ringaskiddy village itself, the worst-case predicted noise levels with alarm are generally in the range of the existing ambient noise levels and above the background noise levels. Without the alarm noise, worst-case predicted noise levels will generally be below or at the bottom of the range of existing ambient noise levels but above or at the higher end of background noise levels at these locations.

On the basis of these predictions and the existing noise environment in Ringaskiddy village, worst-case noise levels from the proposed CB / MPB have the potential to raise the ambient noise levels within the village and to significantly raise the background noise levels. There will be a requirement for mitigation measures to be in place to ensure that significant noise level increases are not experienced at properties within the village and these are discussed in section 9.6 of this Chapter.

In Monkstown, worst-case predicted noise levels from the proposed CB / MPB with alarms will be below the existing daytime ambient noise levels and in the middle of the range of background noise levels recorded at properties in this area. Without alarms, worst-case predicted noise levels will be well below ambient noise levels and below or at the bottom of the range of background noise levels recorded in the noise monitoring survey. On the basis of this assessment, predicted noise levels from the proposed CB / MPB will be a low level contributor to background noise levels at Monkstown during the day, albeit when alarms are sounded they will be audible.

In the areas of Whitepoint and Blackpoint, ambient noise levels are generally a little lower than in Monkstown and Ringaskiddy, principally on account of the greater distance of properties from significant roads in the area. On account of this, worst-case predicted noise levels from the proposed CB / MPB have the potential to be similar to the middle and upper range of ambient noise levels currently experienced at these locations. Without the alarm, worst-case noise levels are generally below ambient noise levels and at the bottom of the range of background noise levels. Mitigation measures to reduce the noise impact from the proposed CB / MPB at Whitepoint and Blackpoint are discussed in section 9.6 of this Chapter.

Overall, the assessment of worst-case predicted noise levels from the proposed CB / MPB during daytime hours indicates that there is potential for significant noise level increases to be experienced in the vicinity of Ringaskiddy village and the Whitepoint / Blackpoint area. A large factor in any of the

potential noise impacts associated with the proposed CB / MPB is the contribution of the alarm/beacon noise included in the noise model, which is increasing the worst-case predicted noise levels by approximately 3-5dB(A) in the vicinity of Ringaskiddy village and the Whitepoint / Blackpoint area. This is in many cases changing the worst-case predicted noise levels from being at the lower end of existing recorded background noise levels to the higher end of recorded background noise levels and in the range of existing ambient noise levels.

It is important to note that a high sound power level was included in the noise model to account for the alarm/beacon noise (i.e. Lw = 111dB) and that this was further increased with a 5dB penalty to account for the tonal quality of the noise. While taking measurements as part of the Maersk Container Vessel noise survey (see section 9.3.2), it was noted that measured noise levels of crane alarms in the vicinity of Ringaskiddy village were not nearly as high as those predicted in the noise model. In this regard, the worst-case predicted noise levels included in the noise model for alarms are likely to be an overestimation of the likely noise levels. This will be discussed further as part of the mitigation measures included in section 9.6.

It must be noted that this assessment compares worst-case predicted noise levels from the proposed redevelopment during the day at the nearest noise sensitive receptors. In setting the context for this assessment, it must be considered that worst-case noise levels will only occur for a relatively small proportion of the time and that noise levels will generally be below worst-case noise levels and in many instances, well below worst-case noise levels.

Table 9.17 presents the worst-case predicted night-time noise levels at the proposed CB / MPB with the existing ambient and background night-time noise levels recorded at the nearest noise sensitive properties. As with the daytime assessment, worst-case predictions with and without alarm noise have been presented in the table.

Table 9.17: Predicted Night-time Noise Levels from Proposed CB / MPB and Existing Noise Levels at Nearest Noise Sensitive Properties

Property Reference (Fig 9.2-9.4, Vol. II)	Existing Night-time Ambient L_{Aeq} dB(A)	Existing Night-time Background L_{A90} dB(A)	Worst-Case Predicted Noise Levels - Night (No Alarm) L_{Aeq} dB(A)
1	39-49	32-38	42.3 ((38.4)
2	31-40	28-30	43.1 (38.9)
3	37-45	29-34	48.5 (42.9)
4	44-52	29-34	49.6 (43.9)
5	44-52	29-34	50.1 (44.4)
6	44-52	30-44	50.8 (45.0)
7	44-52	30-44	48.1 (43.6)
8	44-52	30-44	51.4 (45.6)
9	44-52	30-44	47.8 (43.8)
10	44-52	30-44	51.9 (46.0)
11	44-52	30-44	52.1 (46.1)
12	40-54	30-44	52.4 (46.3)
13	40-54	30-44	53.1 (46.9)
14	40-54	30-44	48.5 (43.7)
15	-	-	44.2 (40.1)
16	-	-	43.0 (39.1)
17	40-54	28-40	53.8 (47.5)
18	40-54	28-40	54.6 (48.0)
19	40-54	28-40	54.8 (48.1)
20	42-52	36-50	54.8 (48.1)
21	42-52	36-50	54.8 (48.0)
22	40-54	28-40	49.7 (45.5)
23	42-52	36-50	54.9 (48.1)
24	42-52	36-50	54.7 (48.0)
25	42-52	36-50	54.6 (47.9)
26	42-52	36-50	54.6 (47.9)

27	-	-	51.3 (44.6)
28	43-58	34-50	42.4 (35.4)
29	43-58	34-50	43.0 (36.0)
30	43-58	34-50	43.2 (36.2)
31	43-58	34-50	43.3 (36.3)
32	43-58	34-50	43.5 (36.5)
33	30-52	26-42	42.5 (35.7)
34	38-48	30-34	43.3 (36.4)
35	38-48	30-34	43.3 (36.5)
36	38-48	30-34	43.3 (36.4)
37	30-52	26-42	42.7 (35.9)
38	30-52	26-42	41.4 (34.9)
39	42-52	36-40	43.1 (36.2)
40	42-52	36-40	43.0 (36.1)
41	42-52	36-40	42.8 (36.0)
42	39-49	38-40	42.4 (35.7)
43	36-48	32-44	45.4 (38.8)
44	38-44	30-40	45.4 (39.5)
45	38-44	30-40	47.5 (40.9)
46	38-44	30-40	46.6 (40.1)
47	38-44	30-40	46.4 (39.9)
48	33-42	30-40	46.3 (39.8)
49	33-42	30-40	46.2 (39.7)
50	33-42	30-40	45.7 (39.3)
51	33-47	32-44	41.0 (37.0)
52	33-42	32-44	40.6 (36.7)
53	34-47	31-36	39.2 (35.3)

At the Naval Base, worst-case predicted night-time noise levels (with alarm) from the Port are in the middle of the range of existing ambient noise levels measured at the Naval Base and above the measured background noise levels. When the alarm is excluded from the noise model, worst-case predicted noise levels are below existing ambient noise levels and at the bottom of the range of existing background noise levels. On this basis, worst-case noise levels from the proposed redevelopment are only likely to have a significant and audible effect at the Naval Base when alarm noise is coming from the site.

The NMCI does not contain residents and hence there is no issues in terms of night-time sleep disturbance at this location. In Ringaskiddy village, worst-case night-time noise levels from the proposed CB / MPB with alarms will be above or on the upper range of existing ambient night-time levels in the village and will generally be well above measured background noise levels. Without alarms, worst-case predicted night-time noise levels from the proposed CB / MPB will be on the low to middle of the range of existing night-time ambient noise levels and on the upper portion of the range of background noise levels recorded in the village. On the basis of these worst-case predicted night-time noise levels, there is potential for significant night-time noise impacts at Ringaskiddy village if mitigation measures are not in place for the night-time period. This is discussed further in section 9.6.

In Monkstown, worst-case predicted night-time noise levels from the proposed CB / MPB with alarms will be in the lower to middle portions of the range of ambient noise levels currently recorded in the area and above or at the upper portion of the range of background noise levels. Without the alarm noise, worst-case predicted night-time noise levels will be below or at the lower end of the range of existing ambient noise levels and will be below or at the lower end of existing background night-time noise levels. In the context of the existing noise environment at Monkstown, worst-case predicted noise levels from the proposed CB / MPB will be a low level contributor to background noise levels at night-time in Monkstown. However, with the alarm noise, worst-case predicted noise levels will become a prominent and audible part of the night-time ambient noise levels in Monkstown. Mitigation measures for the noise from the proposed CB / MPB are discussed further in section 9.6.

In the Whitepoint / Blackpoint area, worst-case predicted night-time noise levels from the proposed CB / MPB with alarms will be above or on the upper end of the range of night-time ambient noise levels

currently recorded in the area and above existing background noise levels. Without the alarm noise, worst-case predicted night-time noise levels will be in the middle portion of the range of existing ambient noise levels and will be on the upper end of existing background night-time noise levels. In the context of the existing noise environment at Whitepoint and Blackpoint, worst-case predicted noise levels from the proposed CB / MPB will be a significant contributor to background noise levels at night-time in this area without mitigation measures in place. With the alarm noise, worst-case predicted noise levels will be a prominent and audible part of the night-time ambient noise levels in the area. Mitigation measures for the noise from the proposed CB / MPB are discussed further in section 9.6.

Overall, the assessment of worst-case predicted noise levels from the proposed CB / MPB during night-time hours indicates that there is potential for significant noise level increases to be experienced in the vicinity of Ringaskiddy village and the Whitepoint / Blackpoint area and for worst-case predicted noise levels when alarms are active to be prominent at Monkstown also. As discussed with the assessment of daytime noise, a large factor in any of the potential noise impacts associated with the proposed CB / MPB is the contribution of the alarm/beacon noise included in the noise model, which is increasing the worst-case predicted noise levels by approximately 4-7dB(A) at night-time. This is in many cases changing the worst-case predicted noise levels from being within the range of existing recorded background noise levels to significantly above background noise levels and in the upper portion of the range of existing ambient noise levels.

It is important to note again that a very high sound power level was included in the noise model to account for the alarm/beacon noise (i.e. Lw = 111dB) and that this was further increased with a 5dB penalty to account for the tonal quality of the noise. While taking measurements as part of the Maersk noise survey (see section 9.3.2), it was noted that measured noise levels of crane alarms in the vicinity of Ringaskiddy village were not nearly as high as those predicted in the noise model. In this regard, the worst-case predicted noise levels included in the noise model for alarms are likely to be an overestimation of the likely noise levels. This will be discussed further as part of the mitigation measures included in section 9.6.

It must be noted that this assessment compares worst-case predicted noise levels from the proposed redevelopment during the night at the nearest noise sensitive receptors. In setting the context for this assessment, it must be considered that worst case noise levels will only occur for a relatively small proportion of the time and that noise levels will generally be below worst-case noise levels and in many instances, well below worst-case noise levels.

A further consideration in framing the context for the likely night-time noise impacts associated with the proposed redevelopment is that the number of nights in which night-time working will be occurring at the Port will be limited and will tend to be occasional rather than the norm. In many respects, the extent of night-time working at the Port will be generally quite similar to what is occurring at present, with the plan being to deal with much of the existing scheduled visits (e.g. the weekly Maersk visit) at the proposed CB / MPB rather than at the DWB where it is currently processed.

A detailed consideration of mitigation measures to reduce the potential day and night-time noise impacts from the proposed MPB are included in section 9.6 of this Chapter.

9.5.3 Noise Impact from Traffic Movements In and Out of Port from Proposed Redevelopment

This section includes an assessment of the potential noise impact associated with the change in traffic movements on the local road network as a result of the proposed redevelopment.

Chapter 8 Traffic and Transportation of the EIS includes a detailed assessment of the traffic impact associated with the proposed redevelopment. As part of the transport assessment, detailed traffic flow information has been derived for the base year (2012), the year of opening (2018) with and without the proposed redevelopment in place and future year scenarios (i.e. 2023 & 2033) with and without the proposed redevelopment in place. In the case of the 2033, different potential options were considered for the proposed N28 scheme including the full scheme and a N8 scheme that terminates at the R613. Table 9.18 includes details on the percentage increase and decrease in traffic flow levels on all the principal roads in the study areas that have the potential to be impacted by the proposed redevelopment.

Table 9.18: Traffic Flow Changes on Local Road Network as a Result of the Proposed Redevelopment

Road Link	Percentage Change in Traffic Flow as a Result of Proposed Development			
	2018	2023	2033 (Full New N28)	2033 (New N28 to R613)
N28 West of R613	+5.8	+7.3	-0.4	+3.0
Board of Works Road	-3.9	-2.9	+0.5	-0.2
Rock Road	+22.1	+12.4	-0.1	-0.8
Raffeen Cross	+0.9	-0.3	+0.1	+0.3
R613 @DWB Junction	+1.9	+1.4	+10.5	+34.0
R613 Coolmore Cross East	+0.4	+2.6	+0.7	+3.7
R613 Coolmore Cross West	+12.2	+10.1	+0.2	+0.4
R613 Carrigaline. Church/Rock Road	+12.2	+10.1	+0.7	+0.4
R610 Raffeen Cross West	+4.7	+3.9	+0.8	+1.4
Ballyorban	+2.7	+1.8	+0.5	+1.1
L6477 Monees	+4.0	+4.8	+0.1	-0.5
Ballinrea Road	+3.3	+1.4	+0.7	-0.1
N28 East of Shanbally	+3.4	+4.6	+0.6	+1.3
N28 West of Shanbally	+0.4	+1.5	+0.9	+0.4
N28 Raffeen Cross East	+0.8	+1.7	+1.1	-0.1
N28 Raffeen Cross West	-0.5	+0.3	+0.1	-0.3
N28 East of Shannonpark	-0.5	+0.3	+0.1	+0.4
N28 Shannonpark East	-0.9	+0.2	0.0	-0.3
N28 North of Shannonpark	-0.3	+0.1	-0.3	-0.3
N28 Hilltown	-0.1	+0.3	-0.3	-0.3
N28 South of B.O.W. Road	0.0	+0.5	+3.1	+3.2
N28 Carr's Hill	+0.4	+0.8	+3.7	+2.8
N28 East of R613 - Old Post Office Road	-3.1	-2.8	+0.7	+0.7
Shanbally underbridge				+17.0
Novartis Link Road				+57.6
N28 Carrigaline Road	+0.4	+0.8	+3.7	+2.8
Barnahealy Southern Link Road	+7.5	+5.6	-1.0	-5.7
Hilltown Road	+20.7	+18.7	0.0	0.0
L6477 Raheenering	-1.6	-1.7	0.0	+0.1
R611 Shannonpark	-1.9	-1.9	-0.3	-0.2
L2492	-7.8	-7.3	+1.7	+1.1
N28 East of R613	-2.7	-2.4	+0.5	+0.7
R613 Coolmore Cross North	-9.2	-8.6	+2.9	+7.2
Shanbally Mews	-5.4	-3.7	0.0	-1.1
R610 Raffeen Cross East	+0.4	-1.3	-0.2	-0.1
Castletreasure Road	-0.3	-0.3	+0.5	-0.1
Upgraded N28 Carr's Hill	NB*	NB*	+6.7	+5.6
Upgraded N28 South of Carr's Hill	NB*	NB*	+6.7	+5.6
Upgraded N28 South of Hilltown Diverge	NB*	NB*	+10.6	+9.3
Upgraded N28 East of Shannonpark	NB*	NB*	+21.5	+18.6
Upgraded N28 East of Shanbally	NB*	NB*	+30.8	+22.1
Upgraded N28 West of Shanbally	NB*	NB*	+21.5	+18.6
Upgraded N28 at Barnahealy	NB*	NB*	+11.4	+22.1
Upgraded N28 Shanbally Diverge	NB*	NB*		+22.1
Upgraded N28 Last Section Ringaskiddy	NB*	NB*	+59.4	NB*
Upgraded N28 Loughbeg	NB*	NB*	+53.2	NB*

* Road not built at this stage

The traffic changes included in Table 9.18 illustrate that there will be traffic flow increases and decreases on various routes in the study area with the proposed redevelopment in place. The table

illustrates that other than in a small number of cases, all traffic flow increases in the various scenarios will be less than 25%. The only scenarios where this will not be the case will be for the 2033 where the new N28 stops at the R613 (i.e. R613@DWB Junction +34%, Novartis Link Road +57.6%) and for the full new N28 in 2033 (i.e. Upgraded N28 East of Shanbally +30.8%,, Upgraded N28 Last Section Ringaskiddy +59.4%, Upgraded N28 Loughbeg +53.2%). In the case of the Novartis Link Road, while the percentage change is significant, the actual noise impact associated with this is negligible on account of the very low traffic flows on this road link (i.e. less than 500 vehicles 24-hour AADT).

The UK Design Manual for Roads and Bridges (DMRB, Volume 11, Section 3, Part 7) states that it takes a 25% increase or a 20% decrease in traffic flows in order to get a 1dB(A) change in traffic noise levels. The majority of the most significant traffic flow increases and decreases listed above are less than a 25% increase or a 20% decrease in traffic flows. Therefore, the majority of traffic flow increases or decreases will result in a less than 1dB(A) change in the traffic noise levels at properties adjacent to these routes.

A small number of road links will experience a traffic noise increase of between 1-3dB(A), these will be the upgraded N28 east of Shanbally (2033 - full new N28), the Novartis Link Road (2033 - new N28 stops at R613), the R613@DWB Junction (2033, new N28 stops at R613),), the upgraded N28 last section Ringaskiddy (2033, full new N28) and the upgraded N28 Loughbeg (2033, full new N28).

It is generally accepted that it takes an approximate 3dB(A) increase in noise levels to be perceptible to the average person (Ref: NRA *Guidelines for the Treatment of Noise and Vibration in National Road Scheme,* 2004). Using this reference in the context of the proposed redevelopment, the traffic noise increases and decreases associated with the proposed redevelopment will be imperceptible to receptors in the vicinity of these roads.

The assessment of traffic noise impacts concludes that there will be no significant traffic noise impact on sensitive receptors in the study area as a result of the proposed redevelopment.

9.5.4 Operational Phase Vibration Impacts

The proposed redevelopment will not result in any vibration generating activities being placed in close proximity to any of the nearest vibration sensitive receptors in the study area. There will be no vibration impact associated with the operational phase of the proposed redevelopment.

9.5.5 Cumulative Noise Impacts

There a range of projects in the study area that are in different stages of planning and have the potential to influence the noise environment in the vicinity of the proposed redevelopment. These have all been considered in the context of the proposed redevelopment and the potential for cumulative noise impacts at the nearest noise sensitive receptors.

Current or future projects that have the potential to alter the noise environment in the study area include the East Tip Remediation Project at Haulbowline Island, the construction of 5 wind turbines by the Cork Lower Harbour Energy Group, the upgrade of facilities at the Hammond Lane Metal Company, the IMERC Masterplan, the Spike Island Masterplan and the proposed Monkstown Marina.

The proposed redevelopment has been assessed against a quieter background noise environment not including any potential noise from the above sources (i.e. worst-case assessment). The above mentioned projects have the potential to increase noise levels at sensitive locations in the immediate vicinity to them, making any noise from the redeveloped Port less prominent at those receptors.

9.6 Mitigation Measures

9.6.1 Construction Phase

Section 9.4 contains an assessment of the noise impact associated with the construction phase of the proposed redevelopment at the nearest noise sensitive properties. The assessment of the worst-case predicted construction noise levels using the ABC Method (BS5228:2009) and the NRA Guidelines (2004) indicates that worst-case construction noise levels will be within the required threshold limits included in these guidance documents.

There will be an onus on the contractor to reduce construction noise levels from the construction phase to the lowest possible levels to ensure that no significant noise impact is experienced at the nearest noise sensitive receptors. The contractor must comply with all of guidance included in British Standard *BS5228:2009 – Noise and vibration control on construction and open sites: Part 1 - Noise* in relation to reducing construction noise levels.

A complaints procedure must be operated by the Contractor throughout the construction phase and all efforts should be made to address any noise issues at the nearest noise sensitive properties.

9.6.2 Operational Phase

Section 9.5 includes an assessment of the operational phase noise and vibration impacts associated with the proposed redevelopment. In particular, the assessment of the proposed CB / MPB illustrated that there was potential for significant day and night-time noise impacts at the nearest noise sensitive properties, most prominently during night-time at Ringaskiddy village and Whitepoint/Blackpoint.

While the assessment of operational phase noise from the proposed CB / MPB illustrated that there is potential for significant noise impacts at the nearest noise sensitive receptors with worst-case predicted noise levels with alarms active, it is important that this assessment is framed in the appropriate context for a balanced consideration to be given to the assessment. In this context, the following key points must be kept in mind in terms of interpreting the likely noise impact from the proposed CB / MPB:

- It is important to note again that a very high sound power level was included in the noise model to account for the alarm/beacon noise (i.e. Lw = 111dB) and that this was further increased with a 5dB penalty to account for the tonal quality of the noise. While taking measurements as part of the Maersk noise survey (see section 9.3.2), it was noted that measured noise levels of crane alarms in the vicinity of Ringaskiddy village were not nearly as high as those predicted in the noise model. In this regard, the worst-case predicted noise levels included in the noise model for alarms are likely to be an overestimation of the likely noise levels;

- It must be noted that this assessment compares worst-case predicted noise levels from the proposed redevelopment during the night at the nearest noise sensitive receptors. In setting the context for this assessment, it must be considered that worst-case noise levels will only occur for a relatively small proportion of the time and that noise levels will generally be below worst-case noise levels and in many instances, well below worst-case noise levels.

- The port will not be active every night. The extent of night-time working at the Port will be generally quite similar to what is occurring at present, with the plan being to deal with much of the existing scheduled visits (e.g. the weekly Maersk visit) at the proposed CB / MPB rather than at the DWB where it is currently processed;

- The assessment of worst-case noise levels from the proposed redevelopment did not include a prominent focus on guideline noise threshold limits included in various Irish and International guidance documents as the extensive baseline noise monitoring survey completed as part of the assessment demonstrated that these threshold limits were exceeded in the existing environment at a large number of locations during day and night-time periods. It was determined that assessing the proposed redevelopment in the context of the existing noise environment was the most appropriate focus for the noise assessment.

Notwithstanding the above points, it is clear that there is potential for significant noise impacts at numerous locations, particularly during the night-time period, if mitigation measures are not in place to reduce noise from the proposed redevelopment to the lowest possible levels.

One of the most prominent features of the detailed noise assessment of activities associated with the proposed redevelopment is that alarm/beacon noise is a major contributory factor to creating potential significant noise impacts at properties in all areas under consideration in this assessment. If alarm/beacon noise was significantly reduced, a large proportion of potentially significant noise impacts associated with the proposed redevelopment would be eliminated.

The need for alarms is clearly a health and safety issue and therefore, the use of an alternative alarm system cannot compromise the required health and safety standards for the Port. In recent years, various technological solutions have been developed in terms of modifying alarm systems or developing new alarm systems that significantly reduce the noise impact at adjacent sensitive receptors. Options include visual warning systems, proximity sensor alarms, self adjusting or smart alarms, focussed tonal alarms, broadband alarms and directional alarms. Of the potential alternatives to standard 'beeper' alarms that are listed above, self adjusting 'smart' alarms and broadband alarms offer the most significant improvement in terms of noise impacts.

The mitigation measures for alarm/beacon noise associated with the proposed redevelopment will involve setting a noise threshold limit of 100dB L_w (95dB L_w with tone) for the selected alarm system to be used. There is a range of self adjusting 'smart' and broadband alarm systems that are capable of achieving the required noise threshold limit (e.g. manufacturers - bbs-tek, Ecco, Fleet Electrical).

In addition to the alarm noise, a series of noise barriers (block walls) have been included in the detailed design of the proposed redevelopment to ensure that a significant proportion of ground based noise activities are reduced as much as possible. Figure 9.15 (EIS Volume II) illustrates the location of three 4m high noise barriers that will be included in the design of the proposed redevelopment. These barriers will result in significant attenuation to noise from a range of plant such as terminal transporters, reach stackers and reefers.

The assessment of the redeveloped DWB included in section 9.5.1 detailed how the potential addition of one mobile crane and a hopper to future operations at the extended DWB could result in minor noise level increases in the direction of Ringaskiddy (i.e. <1dBA) and Whitepoint / Blackpoint (1-2dBA) and moderate noise increases in the direction of Monkstown (i.e.2-5dBA). As the use of this additional plant would only occur during daytime hours and as the potential noise level increases would result in noise from the DWB that would be still significantly below daytime ambient noise levels at the nearest properties, there will be no significant noise impact associated with the proposed alterations to the DWB.

It is proposed that the mitigation measures outlined earlier in this section for alarm noise will be extended to any existing and proposed plant in the extended DWB. The provision of alternative alarm systems at the DWB will ensure that with the proposed development in place, an overall improvement will be experienced in terms of worst-case noise levels from the extended DWB as compared with the existing operations at the DWB.

9.6.3 Vibration

As outlined in section 9.4.4, the construction phase of the proposed redevelopment is not likely to result in any significant vibration impacts at the nearest sensitive receptors. Section 9.5.4 clarified how there will be no operational phase activities likely to give rise to vibration impacts at any of the nearest sensitive receptors.

BS5228:2009 Code of Practice for Noise and Vibration Control on Construction and open Sites - Part 2: Vibration includes a range of measures for the reduction of vibration associated with piling activities and for general surface based activities. The contractor will adhere to the mitigation measures included in BS5228:2009 where practicable to reduce vibration levels from general and piling activities to the lowest possible levels.

9.7 Residual Impact

During the construction phase, worst-case construction activities may contribute to elevating the noise levels at some of the nearest noise sensitive properties, although worst-case predicted noise levels from construction phase activities are within the required thresholds outlined in the relevant noise guidance documents.

There will be no significant noise impact associated with traffic flow changes as a result of the construction or operational phase of the proposed redevelopment. Any minor traffic flow changes associated with the proposed redevelopment will not be in the range whereby they would be audible at the nearest noise sensitive properties. There will be no significant vibration impact associated with the proposed redevelopment.

The proposed redevelopment has the potential to result in elevated noise levels at some of the nearest noise sensitive properties during day and night-time periods. A range of mitigation measures have been outlined in the Chapter to reduce noise levels to the lowest possible levels, a key component of which will be a solution to the alarm noise on-site.

Table 9.19 and 9.20 outline the worst-case predicted operational phase noise levels for day and night-time periods from the proposed redevelopment with mitigation measures in place. These predicted noise levels are based on a worst-case scenario of all items of plant/equipment being active simultaneously, which is only likely to occur for a relatively small proportion of the time. In reality, actual noise levels from the redeveloped Port will be below these levels for the majority of the time and significantly below these levels for a significant proportion of the time the Port is in operation.

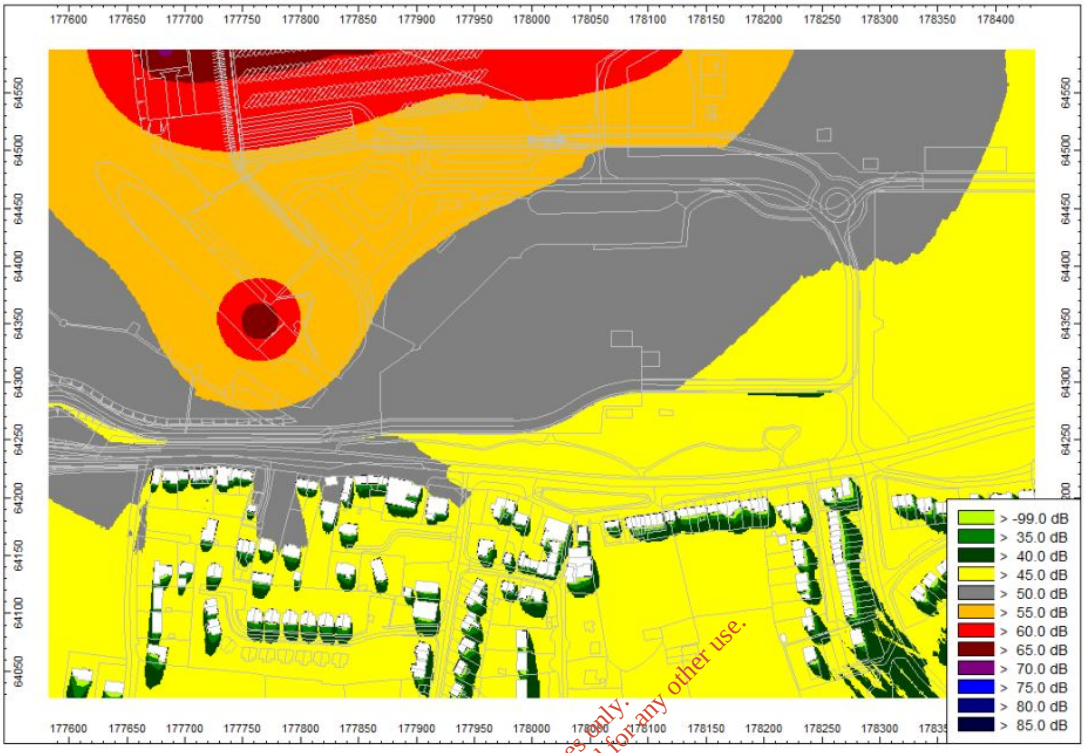
Table 9.19: Predicted Daytime Noise Levels from Proposed Redevelopment with Mitigation Measures in Place

Property Reference (Fig 9.2-9.4, Vol. II)	Existing Daytime Ambient L_{Aeq} dB(A)	Existing Daytime Background L_{A90} dB(A)	Worst-Case Predicted Noise Levels - Day L_{Aeq} dB(A)
1	50-64	40	40.6
2	40-56	40-50	41.4
3	50-56	35-45	45.6
4	51-60	35-45	46.3
5	51-60	35-45	46.4
6	51-60	35-45	46.5
7	51-60	35-45	45.4
8	51-60	35-45	46.7
9	51-60	35-45	46.0
10	51-60	35-45	47.5
11	51-60	35-45	47.8
12	51-56	35-45	48.2
13	51-56	35-45	49.1
14	51-56	35-45	45.8
15	-	-	42.1
16	-	-	41.2
17	51-56	40-55	49.7
18	51-56	40-55	50.6
19	51-56	40-55	51.0
20	54-58	40-55	51.5
21	54-58	40-55	51.7
22	51-56	40-55	48.5
23	54-58	40-55	51.9
24	54-58	40-55	52.0
25	54-58	40-55	51.7
26	54-58	40-55	51.7
27	-	-	47.7
28	54-60	40-50	38.0

29	54-60	40-50	38.7
30	54-60	40-50	38.9
31	54-60	40-50	39.0
32	54-60	40-50	39.2
33	44-52	35-50	38.4
34	52-68	40-50	39.1
35	52-68	40-50	39.1
36	52-68	40-50	38.9
37	44-52	35-50	38.5
38	44-52	35-50	37.4
39	53-56	40-50	38.7
40	53-56	40-50	38.6
41	53-56	40-50	38.4
42	50-55	40-50	38.0
43	45-49	40-50	36.0
44	46-52	40-50	41.3
45	46-52	40-50	42.8
46	46-52	40-50	42.3
47	46-52	40-50	41.8
48	42-50	40-50	41.6
49	42-50	40-50	41.6
50	42-50	40-50	41.1
51	46-53	40-50	38.8
52	42-50	40-50	36.0
53	46-53	40-50	37.2

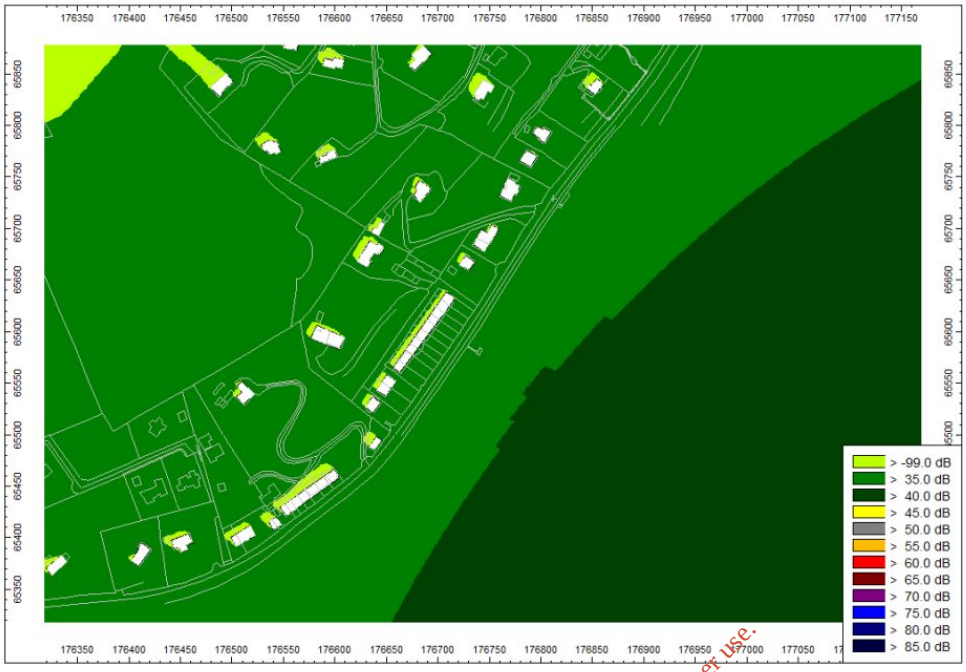
With mitigation measures from the proposed redevelopment in place, worst-case predicted daytime noise levels from the proposed redevelopment will be at the lower end of existing background noise levels recorded in the vicinity the Naval Base and the NMCI. On the east side of Ringaskiddy village, worst-case predicted daytime noise levels with mitigation in place will be below existing ambient noise levels and marginally above the upper end of the range of background noise levels recorded. On the west side of the village, worst-case predicted daytime noise levels with mitigation in place will be below ambient noise levels and on the upper end of the range of background noise levels recorded. Worst-case predicted daytime noise contours for the proposed redevelopment with mitigation in place are illustrated in Figure 9.16.

Figure 9.16: Daytime Noise Contours for Proposed Redevelopment (With Mitigation) at Ringaskiddy Village



In the Monkstown area, worst-case predicted daytime noise levels with mitigation in place will be significantly below existing ambient noise levels and in the majority of instances below daytime background noise levels. In small number of instances, these worst-case predicted daytime noise levels will be in the lower end of the range of background noise levels for properties that are set off from the R610 that passes through Monkstown. Worst-case predicted daytime noise contours for the proposed redevelopment in the vicinity of Monkstown with mitigation in place are illustrated in Figure 9.17.

Figure 9.17: Daytime Noise Contours for Proposed Redevelopment (With Mitigation) at Monkstown



In the vicinity of Whitepoint and Blackpoint, worst-case predicted daytime noise levels with mitigation in place will be below existing ambient noise levels and at the bottom of the range of daytime background noise levels. Worst-case predicted daytime noise contours for the proposed redevelopment in the vicinity of Whitepoint / Blackpoint with mitigation in place are illustrated in Figure 9.18.

Figure 9.18: Daytime Noise Contours for Proposed Redevelopment (With Mitigation) at Whitepoint / Blackpoint

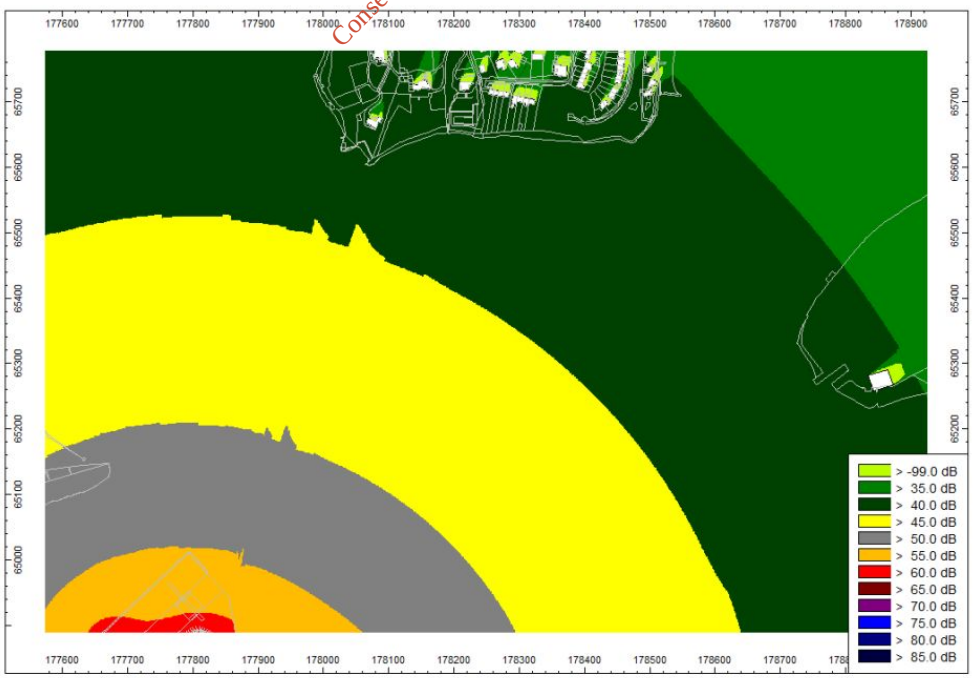


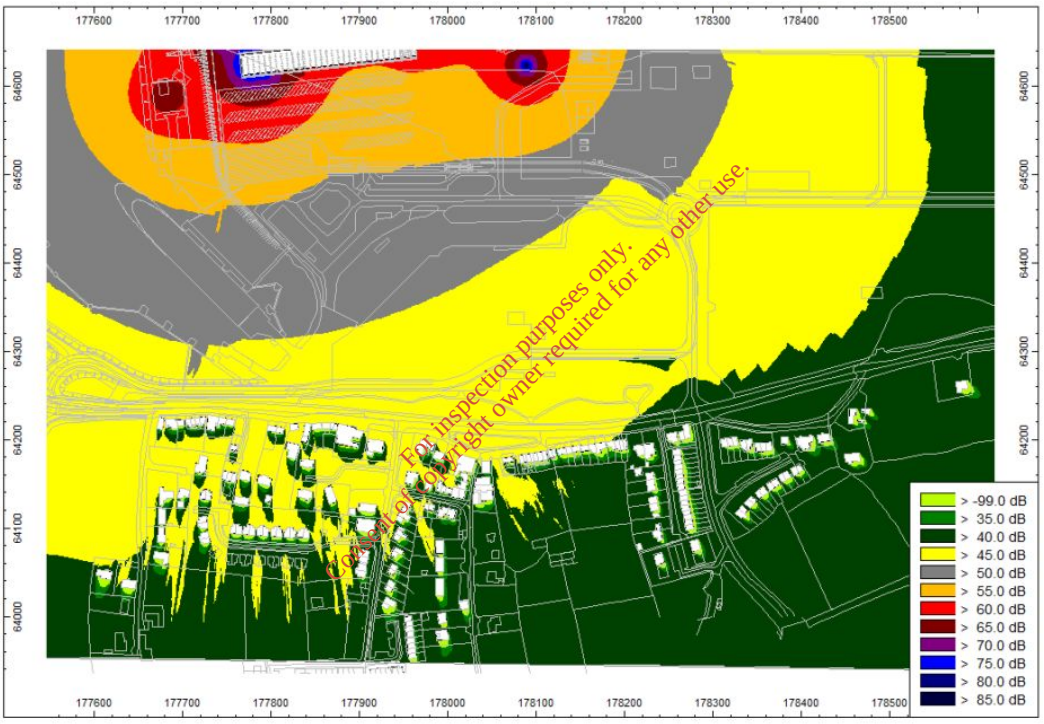
Table 9.20: Predicted Night-time Noise Levels from Proposed Redevelopment with Mitigation Measures in Place

Property Reference (Fig 9.2-9.4, Vol. II)	Existing Night-time Ambient L_{Aeq} dB(A)	Existing Night-time Background L_{A90} dB(A)	Worst-Case Predicted Noise Levels - Night L_{Aeq} dB(A)
1	39-49	32-38	38.5
2	31-40	28-30	39.2
3	37-45	29-34	43.1
4	44-52	29-34	43.6
5	44-52	29-34	43.9
6	44-52	30-44	44.1
7	44-52	30-44	43.1
8	44-52	30-44	44.4
9	44-52	30-44	43.5
10	44-52	30-44	44.9
11	44-52	30-44	45.1
12	40-54	30-44	45.4
13	40-54	30-44	46.2
14	40-54	30-44	43.9
15	-	-	40.2
16	-	-	39.2
17	40-54	28-40	46.5
18	40-54	28-40	47.2
19	40-54	28-40	47.3
20	42-52	36-50	47.4
21	42-52	36-50	47.5
22	40-54	28-40	45.7
23	42-52	36-50	47.5
24	42-52	36-50	48.1
25	42-52	36-50	47.9
26	42-52	36-50	48.0
27	-	-	44.9
28	43-58	34-50	35.8
29	43-58	34-50	36.5
30	43-58	34-50	36.6
31	43-58	34-50	36.8
32	43-58	34-50	36.9
33	30-52	26-42	36.1
34	38-48	30-34	36.8
35	38-48	30-34	36.9
36	38-48	30-34	36.6
37	30-52	26-42	36.2
38	30-52	26-42	35.1
39	42-52	36-40	36.5
40	42-52	36-40	36.4
41	42-52	36-40	36.2
42	39-49	38-40	35.8
43	36-48	32-44	38.4
44	38-44	30-40	39.4
45	38-44	30-40	40.5
46	38-44	30-40	40.3
47	38-44	30-40	39.6
48	33-42	30-40	39.3
49	33-42	30-40	39.3
50	33-42	30-40	38.8
51	33-47	32-44	36.8
52	33-42	32-44	34.0
53	34-47	31-36	35.2

With mitigation measures from the proposed redevelopment in place, worst-case predicted night-time noise levels from the proposed redevelopment will be at the lower end to the middle of the range of existing ambient noise levels in Ringaskiddy village and at the upper end of existing background noise levels. Worst-case predicted daytime noise contours for the proposed redevelopment with mitigation in place are illustrated in Figure 9.19.

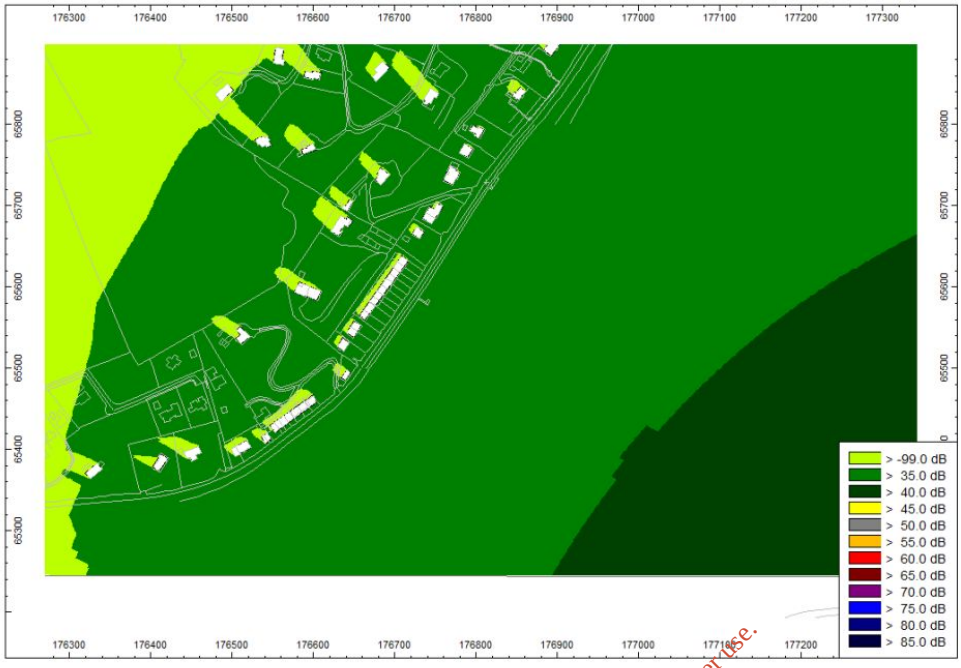
It is important to note that these worst-case night-time predicted noise levels are very much a worst-case scenario with all plant active simultaneously. In reality, noise levels from the proposed redevelopment will be below these noise levels for the majority of the night-time period and in a large proportion of the time, well below these noise levels. Also, night-time activity at the Port will be more of an occasional requirement than a daily requirement and will in many respects be similar to the level of night-time activity currently at the Port (with a lot of current night-time activities moving from the DWB to the proposed CB / MPB). When night-time activity takes place at the Port, it will only occur between the hours of 05:00 and 07:00 in the majority of instances.

Figure 9.19: Night-time Noise Contours for Proposed Redevelopment (With Mitigation) at Ringaskiddy Village



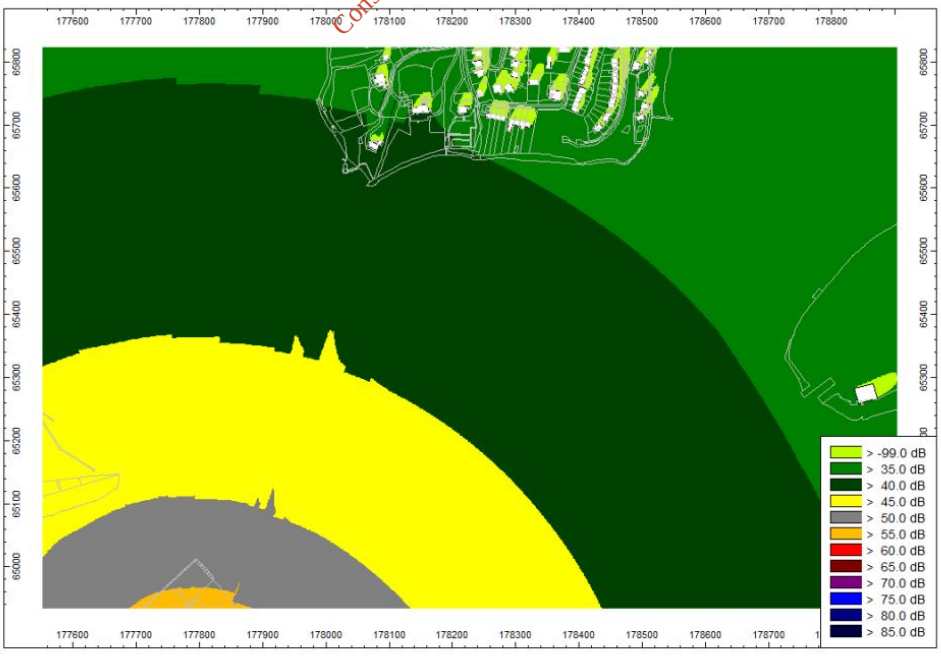
In the Monkstown area, worst-case predicted night-time noise levels with mitigation in place will be significantly below existing ambient noise levels and in the majority of instances and at the lower to middle end of the range of background noise levels. In small number of instances, these worst-case predicted night-time noise levels will be in the lower end of the range of night-time ambient noise levels and marginally above the background noise levels for properties that are set off from the R610. Worst-case predicted night-time noise contours for the proposed redevelopment in the vicinity of Monkstown with mitigation in place are illustrated in Figure 9.20.

Figure 9.20: Night-time Noise Contours for Proposed Redevelopment (With Mitigation) at Monkstown



In the vicinity of Whitepoint and Blackpoint, worst-case predicted night-time noise levels with mitigation in place will be in the middle of the range of existing ambient noise levels and at the upper end of the range of night-time background noise levels. Worst-case predicted night-time noise contours for the proposed redevelopment in the vicinity of Whitepoint / Blackpoint with mitigation in place are illustrated in Figure 9.21.

Figure 9.21: Night-time Noise Contours for Proposed Redevelopment (With Mitigation) at Whitepoint / Blackpoint



With the implementation of the noise mitigation measures detailed in this Chapter, the proposed redevelopment will result in a noise environment that is generally similar to the noise environment that currently exists at noise sensitive receptors in the vicinity of the Ringaskiddy Port. There is the potential for elevation in the noise levels at the nearest receptors in Ringaskiddy and Whitepoint / Blackpoint for periods of time when worst-case night-time activities are taking place at the redeveloped Port, however noise measurements taken during the unloading of the Maersk vessel illustrate that these worst-case night-time scenarios will not be any noisier than any existing night-time activities that are currently taking place at the DWB. Furthermore, the installation of an alternative alarm system for existing and proposed mobile plant will result in a significant improvement in terms of the perception of noise from the Port at night as compared to the existing scenario.