Chapter 6
Traffic and Transportation

CONTENTS

6. TRAFFIC AND TRANSPORTATION

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes, and presents an assessment of the likely significant effects of the proposed DART+ Coastal North project (hereafter the 'Proposed Development') on Traffic & Transportation. The chapter describes the characterisation of the existing road and transport network and assesses the likely potential impact of the Proposed Development during both the Construction and Operational phases on road-based traffic which includes pedestrians, cyclists, buses, taxis and private cars.

The DART+ Coastal North project is providing rail infrastructure which will enable an increase in frequency and capacity on the Northern Line and the Howth Branch in the coming years. It is not intended that this infrastructure will be decommissioned, but rather, as the infrastructure reaches the end of its design life, it will likely be refurbished or renewed to enable continued operation of the railway.

The assessment of the effects of the Proposed Development on Traffic and Transportation herein is based on the draft Railway Order, as well as Chapter 4 (Description of the Proposed Development) and Chapter 5 (Construction Strategy).

The remainder of this chapter is structured as follows:

- Section 6.2 - provides an overview of relevant legislation, policy and guidance documents;
- Section 6.3 - provides details of methodology used to formulate the chapter;
- Section 6.4 – provides details of the receiving environment of the Proposed Development including walking, cycling, public transport and road network;
- Section 6.5 - sets out the detail relating to the potential construction and operational impacts of the project;
- Section 6.6 – provides detail on the mitigation measures associated with the Construction and Operational phase;
- Section 6.7 - sets out the residual effects of the Construction and Operational phases; and
- Section 6.8 - sets out the cumulative effects of the project.

6.1.1 Project Overview

The DART+ Coastal North development, as part of the DART+ Programme, will deliver an improved and extended electrified rail network and will enable increased passenger capacity and an enhanced train service between Dublin City Centre and Drogheda, including the Howth Branch. This increased rail capacity will be achieved by implementing an extended electrified railway network with high-capacity DART trains and an increased frequency of rail services.

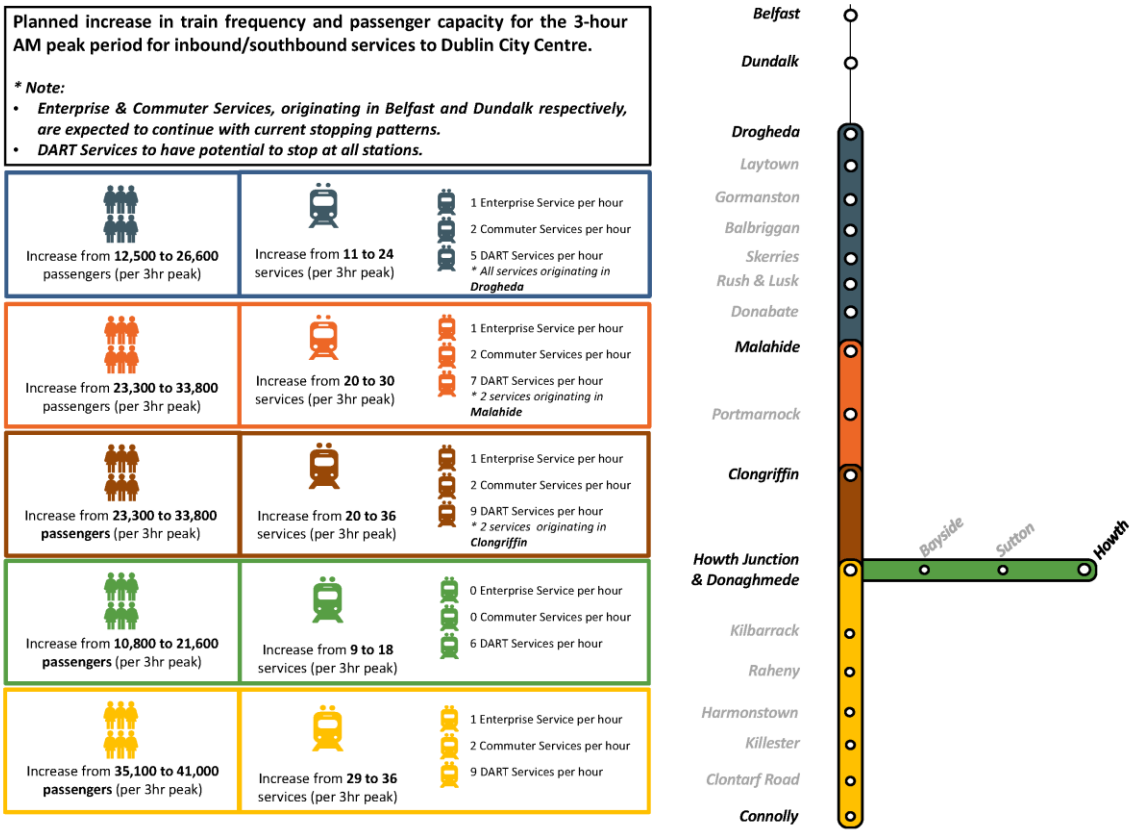


Image 6-1 Service Capacity Increases during AM peak period.

6.2 Legislation, Policy and Guidance

6.2.1 Legislation

This Chapter of the EIAR has been prepared in accordance inter alia with the Transport (Railway Infrastructure) Act 2001 (as amended) (the 2001 Act). The 2001 Act provides for the making of a Railway Order application by Córas Iompair Éireann (CIÉ) to An Bord Pleanála. The European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743 of 2021) gives further effect to the transposition of the Environmental Impact Assessment Directive (EU Directive 2011/92/EU as amended by Directive 2014/52/EU) on the assessment of the effects of certain public private projects on the environment by amending the Transport (Railway Infrastructure) Act 2001 ('the 2001 Act'). The 2001 Act at section 37 requires, inter alia, that the application be made in writing and be accompanied by:

- A draft of the proposed Railway Order;
- A plan of the proposed railway works;
- A book of reference to a plan describing the works which indicates the identity of the owners and of the occupiers of the lands described in the Plan; and
- A report on the likely effects on the environment of the proposed railway works.

A report of the likely effects on the environment of the proposed railway works is addressed by the preparation of this Environmental Impact Assessment Report (EIAR) (previously referred to as an

Environmental Impact Statement in section 39 of the 2001 Act prior to the amendments effected by S.I. No. 743/2021). As mentioned, this EIAR is based on a coordinated approach in order to facilitate An Bord Pleanála carrying out a coordinated assessment with any assessment under the (Council Directive 92/43/EEC of 21 May 1992) on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) or (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009) on the conservation of wild birds (the Birds Directive).

By virtue of section 38 of the 2001 Act the development the subject matter of a Railway Order is deemed to be exempted development (under the Planning and Development Act 2000 (as amended)) and the provisions of Part IV of the Planning and Development Act 2000, which relate to architectural heritage and protected structures, are disapplied where the works involved are authorised by a Railway Order.

An examination, analysis and evaluation is carried out by the Board in order to identify, describe and assess, in the light of each individual case, the direct and indirect significant effects of the proposed railway works, including significant effects derived from the vulnerability of the activity to risks of major accidents and disasters relevant to it, on: population and human health; biodiversity, with particular attention to species and habitats protected under the Habitats and Birds Directives; land, soil, water, air and climate; material assets, cultural heritage and the landscape, and the interaction between the above factors.

In accordance *inter alia* with section 39 of the 2001 Act and the provisions of the EIA Directive, CIÉ, as the applicant for this Railway Order, has ensured that the EIAR is prepared by competent experts; contains a description of the proposed railway works comprising information on the site, design, size and other relevant features of the proposed works; contains a description of the likely significant effects of the proposed railway works on the environment; contains the data required to identify and assess the main effects which the proposed railway works are likely to have on the environment; contains a description of any features of the proposed railway works, and of any measures envisaged, to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment; contains a description of the reasonable alternatives studied by the applicant – here CIÉ – which are relevant to the proposed railway works and their specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the railway works on the environment; contains a summary in non-technical language of the above information; takes into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments; in addition to and by way of explanation or amplification of the specified information referred above, the EIAR contains such additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected and in this regard Annex IV sets out the information which is referred to in Article 5(1) of the EIA Directive. Further the EIAR includes the information that may reasonably be required for reaching a reasoned conclusion in accordance with section 42B of the 2001 Act on the significant effects of the proposed railway works on the environment, taking into account current knowledge and methods of assessment. This assessment has been undertaken in accordance with the above legislative and regulatory regime and describes the characterisation of the existing road and transport network and assesses the likely potential impact of the Proposed Development during both the Construction and Operational phases on road-based traffic which includes pedestrians, cyclists, buses, taxis and private cars.

6.2.2 Policy

The key transport policies and guidance relating to the Proposed Development are listed in Table 6-1 below. A full summary of the documents is available in Chapter 2 (Policy Context) in Volume 2 of this EIAR.

Table 6-1 Planning and Policy Documents

International Policy
United Nations 2030 Agenda (United Nations, 2015)
European Policy
Trans-European Transport Network (TEN-T)
Sustainable and Smart Mobility Strategy
European Union (EU) Green Deal 2019
National Policy
Project Ireland 2040: National Planning Framework
National Development Plan 2021-2030
National Sustainable Mobility Policy
National Investment Framework for Transport Planning in Ireland 2021
Department of Transport: Statement of Strategy 2021-2023
Building on Recovery: Infrastructure and Capital Investment 2016-2021
Climate Action and Low Carbon Development (Amendment) Act 2021
Climate Action Plan 2023
The White Paper, Ireland's Transition to a Low Carbon Energy Future 2015-2030
Regional Policy
Eastern and Midland Regional Spatial and Economic Strategy (RSES) 2019-2031
Transport Strategy for the Greater Dublin Area 2022-2042
Integrated Implementation Plan 2019-2024
Local Policy
Dublin City Development Plan 2022-2028
Fingal County Development Plan 2023-2029
Baldoyle-Stapolin Local Area Plan 2013 (extended to May 2023)
Portmarnock South Local Area Plan 2013 (extended to July 2023)

Donabate Local Area Plan 2016 (extended to March 2026)
Meath County Development Plan 2021-2027
Louth County Development Plan 2021-2027

6.2.3 Guidance

The proposed development has been designed in accordance with the following design guidance documents:

6.2.3.1 Design Manual for Urban Road and Streets (May 2019)

The Design Manual for Urban Roads and Streets (DMURS) was published in May 2019 by the Department of Transport. The document was produced in order to supplement the following documents:

- Traffic Management Guidelines (2003);
- Smarter Travel (2009);
- Guidelines for Planning Authorities on Sustainable Residential development in Urban Areas (2009);
- National Cycle Manual (2011); and
- Planning Guidelines; Local Area Plans (2013).

The aim of this document is to provide guidance enabling well-designed streets in the heart of sustainable communities. The manual recognises the importance of walking and cycling in improving health and well-being and in providing better links to wider communities. The document also recognises the importance of alignment of spatial planning and transport policy to constrain urban sprawl, linking employment to transport and encouraging modal shift to sustainable modes of travel.

To support these objectives, street layouts in cities, towns and villages will be interconnected to encourage walking and cycling and offer easy access to public transport. Compact, more dense and interconnected layouts, particularly where they are served by good quality bus or rail services, will help to consolidate cities, towns and villages making them viable for reliable public transport.

6.2.3.2 National Cycle Manual

The National Cycle Manual, published by the NTA in 2011 is based on the idea of promoting five principles of sustainable safety. The aim of the document is to promote consistent designs for cycle facilities across the nation.

The five principles of Sustainable Safety are:

- Functionality;
- Homogeneity;
- Legibility;
- Forgiveness; and
- Self-Awareness.

6.2.3.3 NTA Permeability Best Practice Guide

The NTA aims to encourage and promote the use of more sustainable modes of transport and to ensure that transport considerations are fully addressed as part of land use planning. Walking and cycling are key sustainable travel modes. These modes of transport can substantially meet the mobility needs of people carrying out their daily activities if they are properly facilitated by land use planning.

The NTA aims to fund transport infrastructure measures which facilitate and promote walking, cycling and public transport. It also aims to address the existing gaps within the transport network, especially where demand for walking and cycling in towns and cities is not being met by the transport network.

6.2.3.4 Traffic and Transport Assessment Guidelines (2014)

The guidelines published by Transport Infrastructure Ireland set out thresholds above which studies are recommended as part of a planning proposal to minimise the impact of future proposals on the national roads network.

6.3 Methodology

6.3.1 Study Area

The study area relates to the areas along the extent of the Proposed Development route including train stations and construction compounds and covers the extents likely to be impacted during the construction and operational phases of the Proposed Development.

Beyond the study area boundary, it is predicted that the construction and operational traffic would be fully integrated within the wider road network without any significant delay or effects and is below the thresholds set out in the TII's Traffic and Transport Assessment Guidelines (May 2014).

The Proposed Development is located across the counties of Dublin, Meath and Louth. As illustrated in Image 6-2, the Proposed Development starts in Dublin City Centre and extends northwards along the existing railway corridor as far as Drogheda, including the Howth Branch line. The scoping stage of the assessment determined this an appropriate study area. Zones where any portion of the area is within 5km of the DART line are assessed as part of the study area.

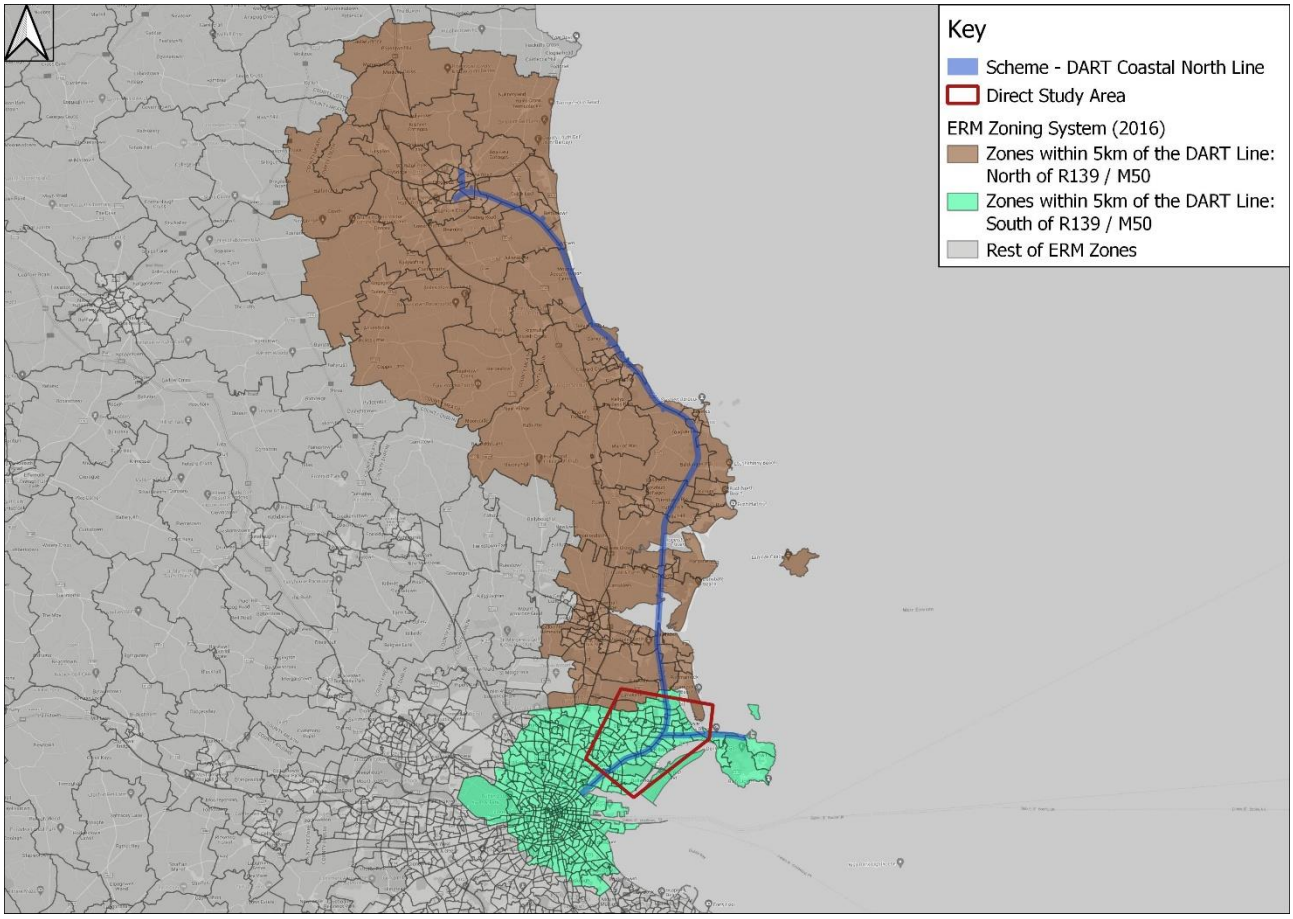


Image 6-2 DART + Coastal North: Study Area Extent

6.3.2 Survey Methodology

To inform the transport and traffic assessment, several sources of data have been used. These are described in the following sections:

6.3.2.1 Desk Surveys

The following publicly available data sources have been used to inform the traffic and transport assessment:

- Census 2016;
- Road Safety Authority's (RSA) road traffic collision data; and
- Bus Route data from Transport for Ireland journey planner;

6.3.2.2 Mapping Data

The following sources of mapping data have been used to inform the assessment:

- Google Earth;
- Google Maps;
- OpenStreet Map; and
- Ordnance Survey Ireland (OSI) Mapping.

6.3.2.3 Road Traffic Surveys

Traffic surveys were conducted in 2022, 2023 and 2024 to understand the baseline vehicular flows in the study area. This is further discussed in Section 6.4.3.3 of this chapter. Pedestrian and cyclist counts were also undertaken at a number of locations.

The traffic survey data was used to inform the assessment and understand the operational impact on vehicles and queueing in the surrounding area. Traffic surveys were carried out on Tuesday 24 May 2022, Thursday 11 May 2023 and Tuesday 14 May 2024 in line with best practise methodology for survey day selection issued by TII. These included classified vehicle junction turning count surveys over a 14-hour period between 0600 and 2000 at the junctions within the study area and also at the level crossings within the study area. The data also included queue length surveys and pedestrian count surveys where appropriate.

The locations for counts carried out in May 2022 are shown in Image 6-3. The locations for the counts carried out in May 2023 are shown in Image 6-3, Image 6-4 and Image 6-5. The locations for the counts carried out in May 2024 are shown in Image 6-6.

Image 6-3 Junction Turning Count and Queue Length Survey Locations from May 2022 and May 2023 – Zone B

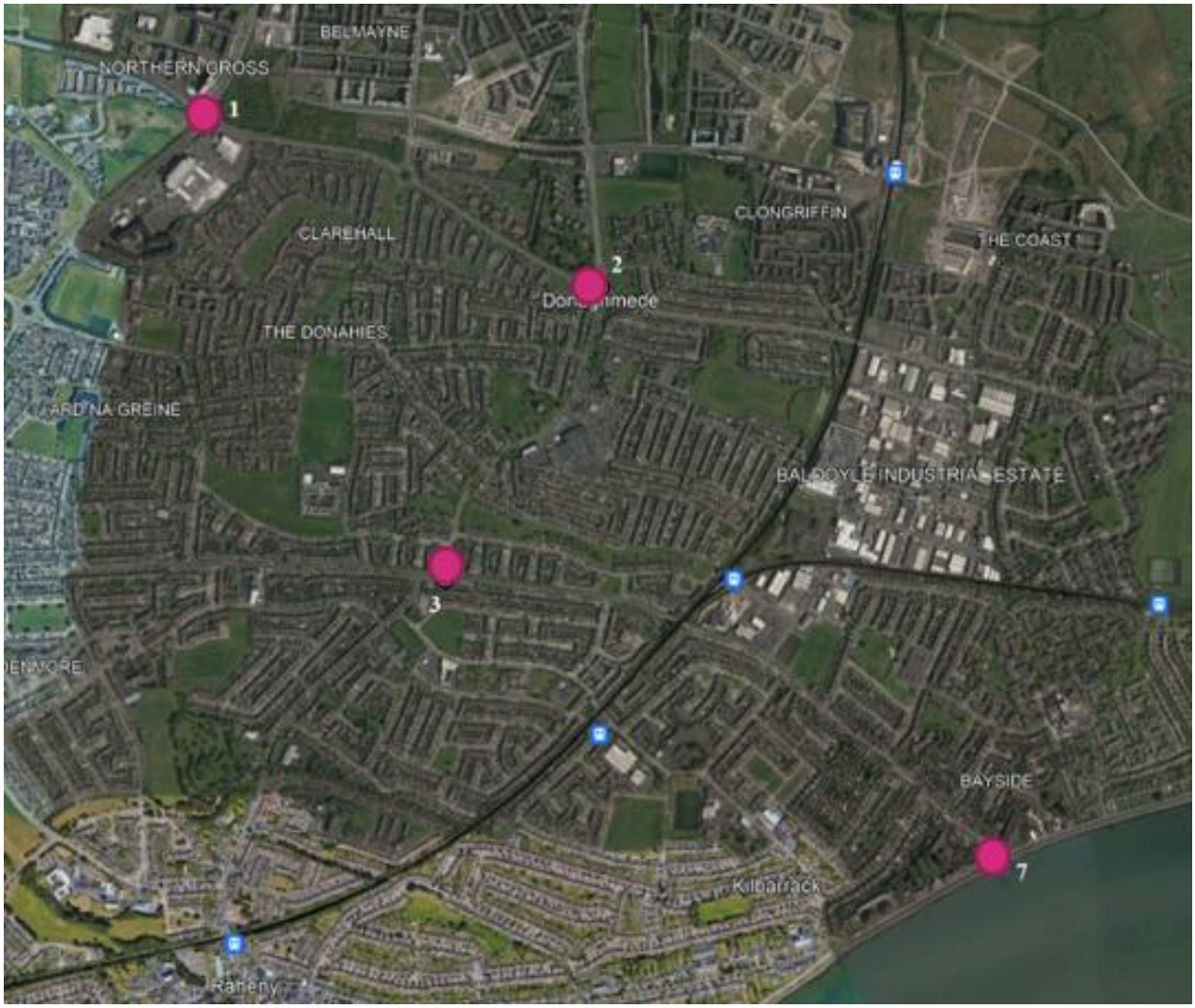


Image 6-4 Junction Turning Count and Queue Length Survey Locations from May 2023 – Zone B

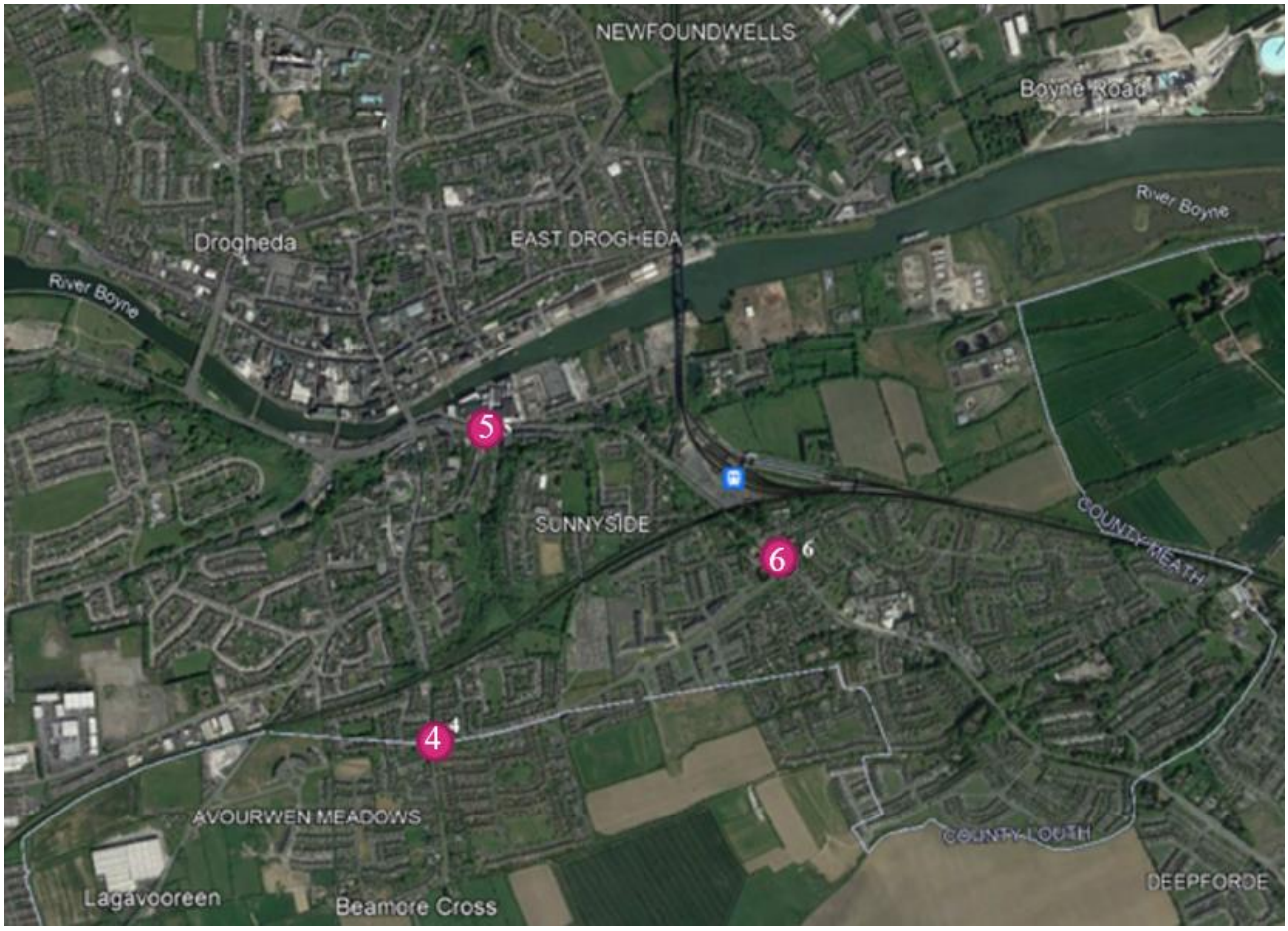


Image 6-5 Junction Turning Count and Queue Length Survey Locations from May 2023 – Zone E

Image 6-6 Junction Turning Count Survey Locations from May 2024 – Zone B

The locations of the traffic, pedestrian and cycle counts are listed in Table 6-2.

Table 6-2 Junction Turning Counts and Queue Length Survey Locations

Site No.	Arm Names	Surveys	Arms	Junction Type
1	R139 / Malahide Road	JTC & Queue	4	Signalised
2	Hole In The Wall Road/R809 Grange Road	JTC & Queue	4	Roundabout
3	R104 Kilbarrack Road/R809 Grange Road	JTC & Queue	3	Signalised
4	Beamore Road / Meadow View/Rosevale	JTC & Queue	4	Unsignalised
5	R132 Dublin Road / Mary Street	JTC & Queue	3	Signalised
6	R132 Dublin Road / Bryanstown Village	JTC & Queue	3	Signalised
7	R104 Kilbarrack Road / R105 Dublin Road / R105 Howth Road	JTC & Queue	3	Signalised
8	R105 Howth Road/R105 Greenfield Road / R105 Dublin Road / R106 Station Road	JTC & Queue	4	Signalised
9	R809 Baldoyle Road/R105 Dublin Road / R105 Dublin Road	JTC & Queue	3	Signalised
10	R105 Howth Road / Howth Lodge	JTC & Queue	3	Boom Gate

Site No.	Arm Names	Surveys	Arms	Junction Type
11	Burrow Road / Lauder's Lane	JTC & Queue	3	Boom Gate
12	R106 Station Road / Irish rail car park	JTC & Queue	3	Boom Gate
13	Warrenhouse Road / Baldoyle Road	JTC & Queue	2	Boom Gate
14	Strand Road / The Mall	JTC & Queue	3	Unsignalised
15	R809 Main Street / The Mall / Warrenhouse Road / Dublin St	JTC & Queue	4	Signalised
16	R106 / Yellow Walls Road	JTC	3	Unsignalised
17	The Haven / Texas Ln / Caves Strand	JTC	3	Unsignalised
18	Sea Road / Yellow Walls Road / Millview Road / Old Yellow Walls Road	JTC	4	Signalised

The baseline peak period count data used in the assessment are discussed in further detail with the summary of relevant traffic count data provided specifically in Table 6-7 and Table 6-8.

6.3.3 Impact Assessment Methodology

6.3.3.1 Categorisation of Effects

Potential effects were considered during the construction and operational periods of the Proposed Development. Effects during the Construction Phase are typically considered as either temporary or short-term, while potential effects during the Operational Phase are typically considered as either medium-term or long-term.

6.3.3.1.1 Impact

The impact of the effect, which occurs in the Construction and / or Operational Phase will either be positive or negative. A positive impact will be where an improvement to the existing scenario is identified, whereas a negative will be, but not limited to, a reduction in facilities, operation or provision of services.

- Positive – provides beneficial improvement on the existing condition; and
- Negative – reduces the level of service currently provided.

6.3.3.1.2 Significance

The significance of the effect is determined by the extent of impact, the magnitude and complexity of the impact, the probability of the impact and its duration, frequency, and reversibility. The rating identified for all road users is broadly categorised into Not significant, Moderate or Significant. These are further defined, as shown in Table 6-3.

Table 6-3 Assessment Criteria (EPA, 2022)

Significance of Effects	Topic Specific Criteria
Imperceptible	No perceived impact on prevailing travel time or distance
Not Significant	A small change in traffic flows without causing a real change in travel time or distance
Slight Effects	A change in traffic flow resulting in a minor change in travel time or distance
Moderate Effects	A change in traffic flows resulting in a modest change in travel time or distance
Significant Effects	A marked change in travel conditions resulting in long delays or travel distance
Very Significant Effects	A significant change in travel conditions resulting in very long delays or travel distance
Profound Effects	A major change in travel conditions resulting in the breakdown in traffic flow and significant delays to traffic

6.3.3.1.3 Duration

Effects lasting less than a year are considered temporary, between a year and 7 years are considered short-term and between 7 years and 15 years are considered medium term.

6.3.3.2 Assessment of Construction Impacts

Safety within the assessment is reviewed in terms of the Construction Phase while making use of data including daily traffic flows, available public transport infrastructure and services, pedestrian and cyclist counts and the accident history available for the road network within the study area.

6.3.3.2.1 Assessment Period

The Construction Phase will, in comparison to the Operational Phase, be short term and therefore for assessment purposes the peak point of construction has been assessed to identify the greatest impact to road users, pedestrians, and cyclists.

Due to the length of the proposed programme and the proposed staggering of construction works, not all works will be undertaken at once. However, for a robust assessment of the worst case, the assessment undertaken assumes that the construction impacts would occur at the same time, although this is unlikely to be the case.

The impacts are therefore considered to be less than identified in the assessment discussed below. Undertaking a robust assessment where construction is concerned ensures that any mitigation requirements are not underestimated. On this basis, worst case construction scenarios have been taken forward within the assessments.

The construction works range from those that are located outside of the railway boundary (thus, having no impact or minimal impact on train operations) to those that will require a temporary closure of a section normally during night-time track possession works or full weekend possession works to limit the impact on rail services.

To determine the impact during the Construction Phase in regard to safety, the following was reviewed:

- Traffic flows from the modelling for the peak hours, including both background traffic and construction specific traffic;
- Public transport infrastructure and service details; and
- Pedestrian and cyclist numbers and infrastructure.

6.3.3.3 Assessment of Operational Impacts

Where relevant, it was ensured that the assessment methodology is consistent with the assessment methodology that was applied for other major transport schemes in the GDA, namely the DART+ West, DART+ South West and the Dublin BusConnects scheme.

6.3.3.3.1 Scenarios

- **Do Nothing (DN)** – The Do-Nothing scenario is also known as the baseline and represents the existing situation of traffic and transport conditions. This scenario will not include any of the committed schemes including DART + Coastal North. In this study, no further analysis was carried out for DN scenario.
- **Do Minimum (DM)** – The Do Minimum scenario represents the likely traffic and transport conditions in the study area and includes any transportation schemes which will have taken place, have been approved or are planned for implementation **without** the proposed scheme (DART + Coastal North) in place, except for provision for Battery Electrical Multiple Units (BEMU) on the Connolly to Drogheda line, which is considered to be in place, however has no material impact on the transport assessment in this chapter. This scenario also includes the improvements related to the BusConnects project.
- **Do Something (DS)** – The Do Something scenario represents the likely traffic and transport conditions in the study area and includes any transportation schemes which will have taken place, have been approved or are planned for implementation **with** the proposed scheme (DART + Coastal North) in place. This scenario also includes the improvements related to the BusConnects project along with the impacts of changes to (as detailed in below sections) level crossing closure times. This scenario is referred as DS1 in the report.

6.3.3.3.2 Strategic Modelling

The National Transport Authority's (NTA) Regional Modelling System (RMS) has been used by the team to assess wider impacts of the improvement of the rail service. RMS comprises the National Demand Forecasting Model, five large scale, complex multi-modal regional transport models and a suite of appraisal modules covering the entire national transport network of Ireland. The East Regional Model (ERM) was used for this project as it concentrates on Dublin and covers the entire Greater Dublin Area (GDA).

ERM model runs were undertaken collectively for the entire DART+ Programme to ensure consistency between the individual DART+ improvements projects.

The ERM was used to provide estimates in terms of the potential mode shift to rail transport and the potential re-routing of traffic and impact on network performance, due to the proposed improvement of the rail service.

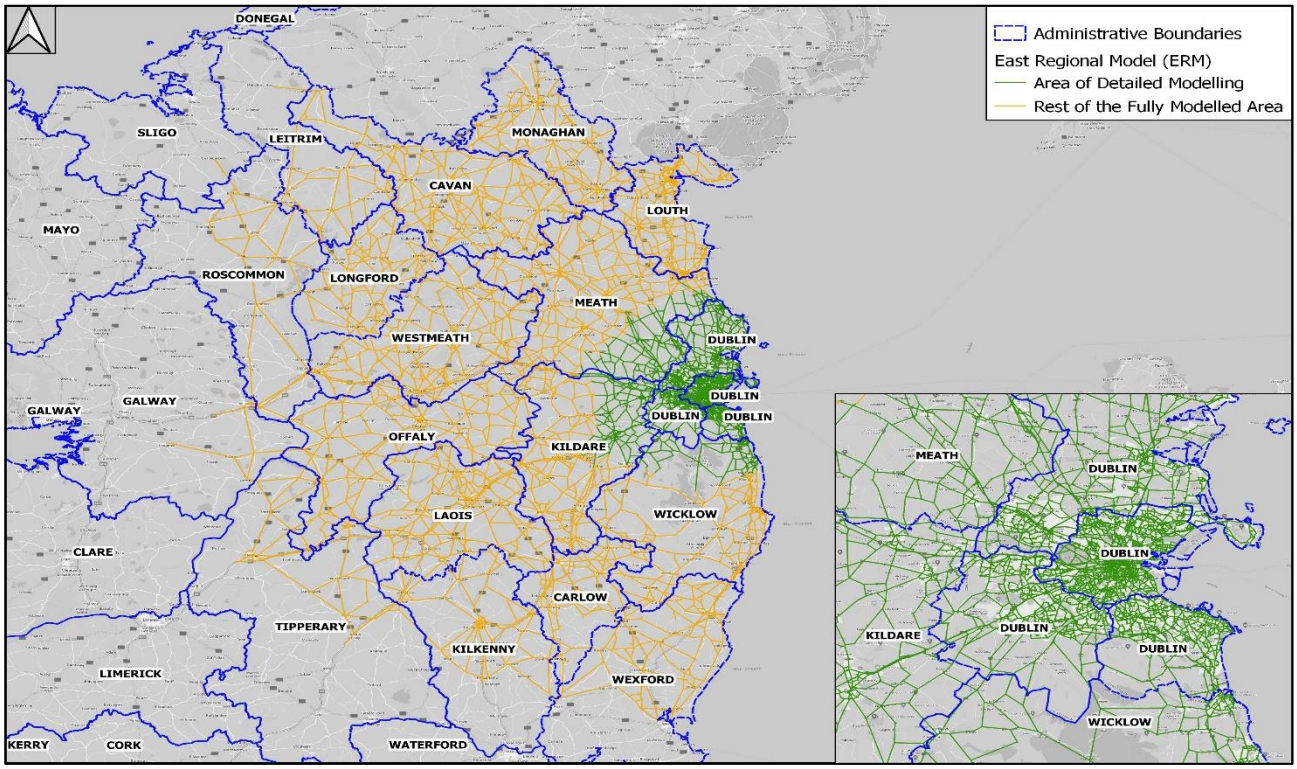


Image 6-7 Extent of the ERM

6.3.3.3.3 Local Area Modelling

The ERM's 2016 base year was used along with 2019 traffic surveys to develop a calibrated Dublin Local Area Model (DLAM). The baseline scenario year for DLAM for DART + Coastal North is 2019.

The DLAM is considered to be the best source of information and forecasting capability as it contains more detailed network coding than the ERM and, due to the validation to 2019 observed traffic patterns, provides greater accuracy and robustness within the local area which is focussed on Dublin City Centre. The DLAM process ensures any potential mode shift to rail transport and potential resulting redistribution of traffic on the road network are taken on board based on the outputs from the ERM. Image 6-8 shows the process of developing the traffic models for the DART + Coastal North project and the interactions between the DLAM and the ERM.

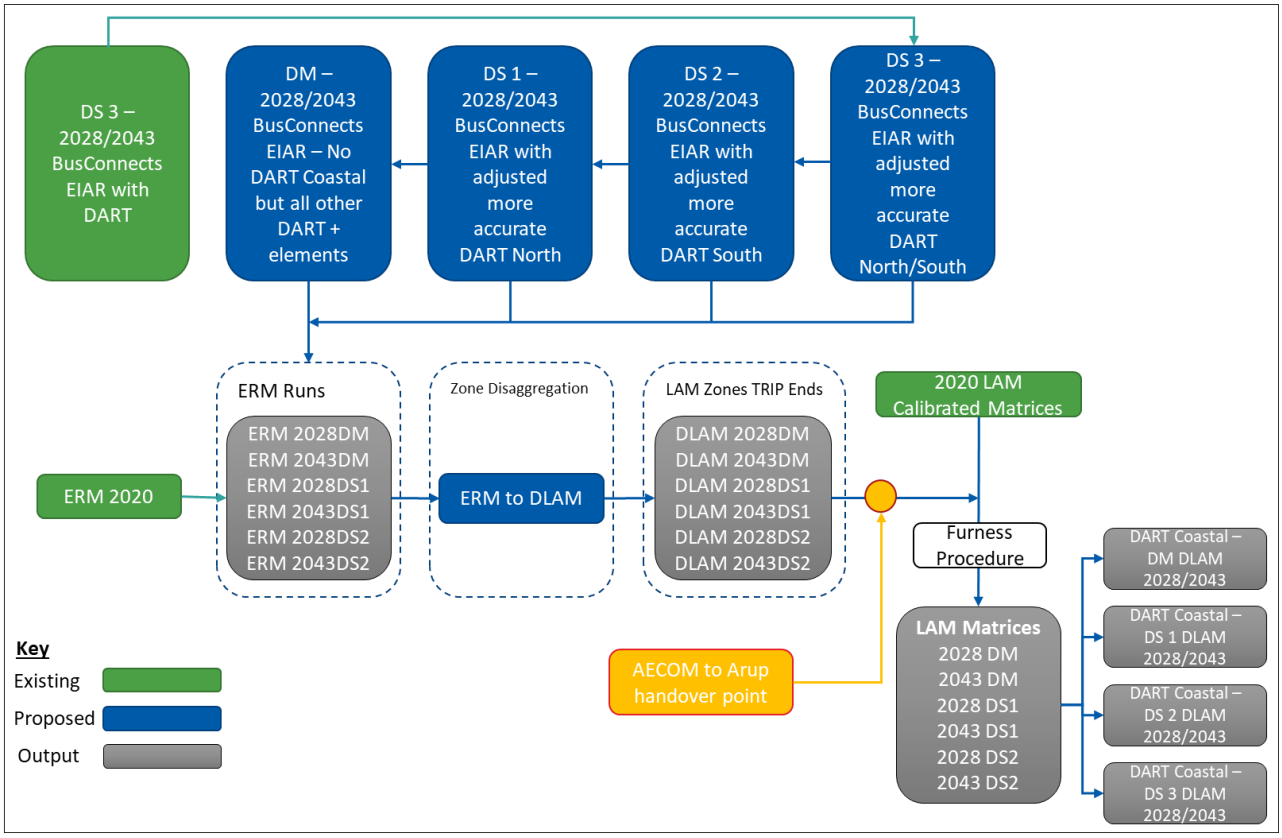


Image 6-8 Transport Modelling Methodology

More information on the development of the DLAM is available from the "Clongriffin to City Centre Core Bus Corridor Scheme"[1].

Calibrated forecasts for the Do Minimum DLAM (excl. DART + Coastal North) and the Do Something DLAM (including DART + Coastal North) were derived from extracts from the 2028 and 2043 ERM process outlined in Image 6-7. This shows the extent of the DLAM along with the local authority administrative boundaries in the GDA.

The DLAM was used to provide estimates in terms of the potential re-routing of traffic and impact on overall network and junction performance, due to the proposed changes to level crossing closure times.

[1] Bus Connect IDE-JAC-ENV_TT-0001_XX_00-RP-ES-0005 (Modelling Report).pdf

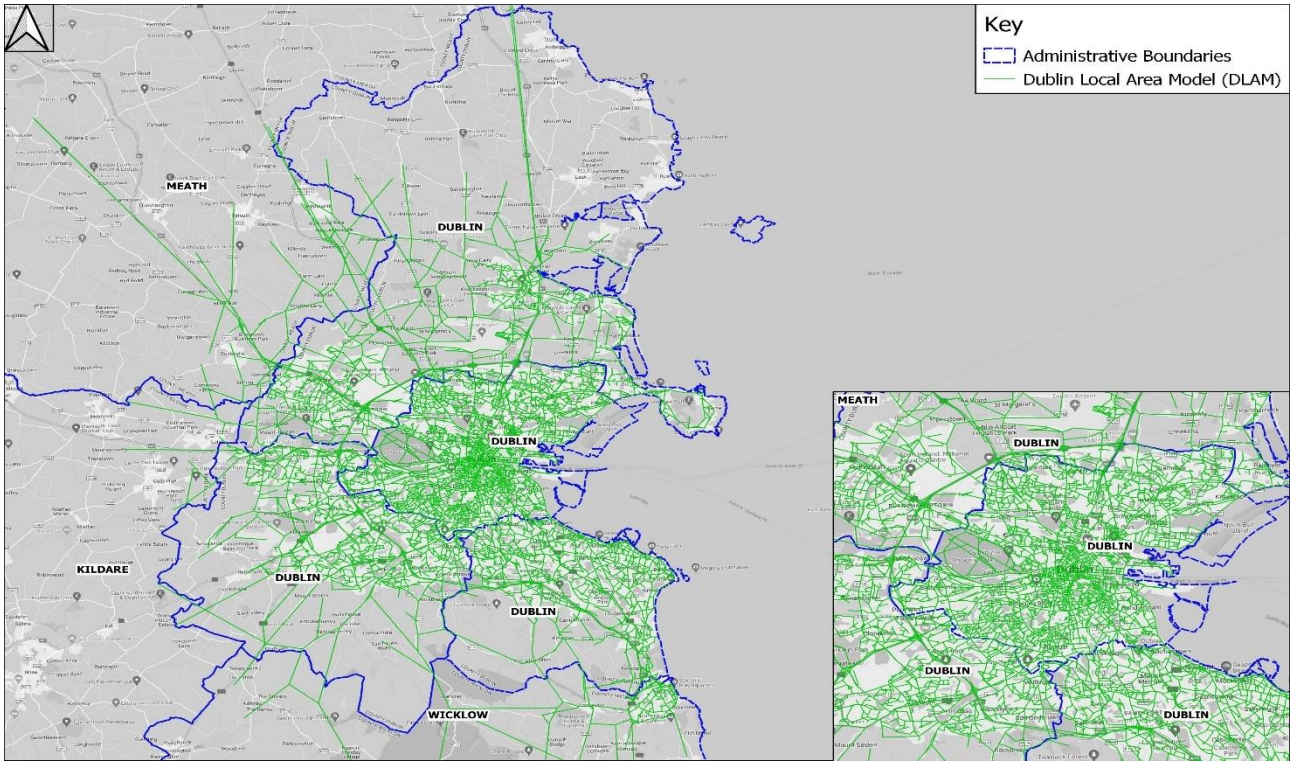


Image 6-9 Local Area Models Extent

Based on ERM, the morning and evening peaks are between 08:00 and 09:00; and 17:00 and 18:00 hours respectively. Image 6-10 shows the extent of DLAM along with traffic flow on various road sections in morning peak.

Image 6-10 2019 Base Year Morning Peak from DLAM

6.3.3.3.4 Junction Modelling and Qualitative Assessment

Junction operations in the vicinity of Kilbarrack (Balydoyle) and Sutton Level Crossings have been analysed through quantitative methods, and those in the vicinity of Cosh and Claremont Level Crossings have been assessed using qualitative analysis methods. These two level-crossings have a much lower volume of traffic crossing them as they are mostly used for local access and therefore do not run a high risk of causing queuing that will affect the regional road network.

The need for quantitative analysis at Kilbarrack (Baldoyle) and Sutton Level Crossing is driven by the high volume of vehicles using the crossings and the potential to, during barrier closure times, cause queuing and delays on the regional road network. Queuing could also be impacted at the junctions upstream and downstream from the level crossings.

Even though some localised impact on queuing is expected, it was assumed that there would be no significant impact on trip distribution (i.e. diversion of traffic), mode choice (i.e. reduction of vehicle traffic) or route choice (i.e. large scale switch between Sutton and Kilbarrack (Balydoyle)) as a result of any changes to level crossing closure times. The approach in assessing potential queueing was therefore robust in the sense that it assumed that the same volume of traffic that currently arrives at the level crossings would continue to arrive in future, and makes no allowance for reduced vehicular traffic due to modal shift and the effects of the implementation of the climate action plan.

The level crossing closure times were simulated in a LinSig network model as signalised junctions which, in effect, represent the barriers being closed. This allowed for an understanding of the mean maximum queue (MMQ) that builds up at both the level crossings and the junctions upstream and downstream of the level crossings.

Deterministic modelling techniques (through the application of Linsig) are particularly suitable for assessing potential queueing as it allows the optimisation of signal timings and is a quick and easy tool with immediate results and is ideal for optioneering.

Junction modelling combined with a qualitative assessment was used to provide estimates in terms of the potential change in queueing in the vicinity of the level crossings and resulting network performance, due to the proposed changes to level crossing closure times.

6.3.3.3.5 Assessment Scenarios

In line with the guidance, the assessment will describe the baseline conditions, determine the likely potential impacts associated with the construction and operation of the Proposed Development, determine appropriate mitigation and monitoring, and define residual effects. The key aspects of the proposed methodology are summarised below.

The process for undertaking the impact assessment of DART+ Coastal North is as follows:

- Determination of baseline conditions through the assessment of available traffic survey data supported by the information extracted for various traffic models, where survey information is not available;
- Determination of forecast year traffic conditions, using future year traffic models for:
  - Scenario without DART+ Coastal North, this is also referred to as the 'Do Minimum' scenario; and
  - Scenario with DART+ Coastal North during operational phase, this is also referred to as the 'Do Something' scenario;
- Assessment of the traffic impact for the 'peak' construction year and the mitigation measures required to alleviate and reduce the associated traffic impact;
- Assessment of the traffic impact for operational year of opening which is 2028 and a +15-horizon operational year, which is 2043; and
- Understanding the impact of the Proposed Development on:
  - The users of the DART+ Coastal North project;
  - Active transport modes, such as pedestrians and cyclists, using industry standard assessment techniques and survey data; and
  - General traffic, considering management and operational issues at both local and strategic levels.

6.3.4 Consultation

A summary of the main elements of project stakeholder and public consultation undertaken in respect of the DART+ Coastal North Project is provided in the Public Consultation No.1 Findings Report (for PC1) and Public Consultation No.2 Findings Report (for PC2) which are included in Volume 4, Annex A3.1 and A3.2. All feedback and comments were collated, including feedback specific to the EIAR topic 'Traffic and Transportation'. The feedback has informed this Chapter and the assessments conducted. Key stakeholders have been reached out to in relation to EIA scoping.

A summary of the feedback received in relation to the scope of the EIA is included in Volume 4, Annex A1.2. All feedback received specifically in relation to the EIA topic of 'Traffic & Transportation' has been reviewed and used to inform this chapter of the EIAR.

Consultation with representatives from relevant departments (including, but not limited to, planning, heritage, traffic & transport) within all of the relevant Local Authorities (Dublin City Council, Fingal County Council, Meath County Council and Louth County Council) has taken place throughout the development of DART+ Coastal North. Specific consultation relevant to 'Traffic and Transportation' has taken place in the form of presentations and meetings to discuss the project in terms of technical design issues, planning implications, and Environmental considerations.

Consultation with representatives from the Emergency Services (Fire Service) has taken place to ensure that the requirements of these vital services are met by DART+ Coastal North.

Five pre-application meetings have been held with An Bord Pleanála to provide detailed information on what the DART+ Coastal North project will involve. A summary of the information provided and the topics discussed at these meetings is provided in Volume 4, Annex A1.3. Feedback relevant to the topic of 'Traffic and Transportation' has been reviewed and taken into consideration as part of the development of this chapter of the EIAR.

In addition to this broader consultation, specific consultation was undertaken, and a summary of this consultation is included in Table 6-4 below:

Table 6-4 Topic-specific Consultation regarding Traffic & Transportation

Consultee	Summary of Consultation Meeting
NTA	Meeting (2021.08.05) with NTA on DART+ Coastal North approach to optioneering
NTA	Meeting (2021.11.17) with NTA on DART+ Coastal North EPO
Dublin Fire Services	Meeting (2023.05.04) with Dublin Fire Services on Howth Branch level crossing implications
Louth County Council	Meeting (2022.09.06) with Louth County Council on Dublin Road Bridge proposals
Fingal County Council	Meeting (2023.06.22) with Fingal County Council Traffic & Operations department on Preferred Option and Howth Branch level crossing implications
Fingal County Council	Meeting (2023.07.10) with Fingal County Council Planning and Environmental departments on Preferred Option and Howth Branch level crossing implications
NTA	Meeting (To Be Arranged) with NTA on Traffic Modelling and project implications on Howth Branch level crossings

6.3.4.1 Difficulties Encountered/Limitations

There have been no difficulties encountered in producing this Chapter of the EIAR.

6.3.5 Scheme Proposals – Overview

The DART+ Coastal North development, as part of the DART+ Programme, will deliver an improved and extended electrified rail network and will enable increased passenger capacity and an enhanced train service between Dublin City Centre and Drogheda, including the Howth Branch. This increased rail capacity will be achieved by implementing an extended electrified railway network with high-capacity DART trains and an increased frequency of rail services. The assessment presented in this chapter considers the impact of the improved railway and increased frequency of services on the transport network.

The objectives of the DART+ Programme are presented in Chapter 1 (Introduction) and more information on the Proposed Development description by zone is provided in Chapter 4 (Description of the Proposed Development) of this EIAR.

6.4 Receiving Environment

6.4.1 Description of Receiving Environment

In this section, descriptions of both infrastructural provision and usage of that infrastructure by each mode for the baseline scenario is presented in detail along the corridor of the Proposed Development. This section therefore includes reference to the following modes:

- General Traffic (motorcycles, cars, taxis, LVs, HGVs);
- Pedestrians and Cyclists;
- Buses; and
- Rail.

The rail line, subject to upgrades and electrification as part of the DART+ Coastal North project is approximately 50 kilometres (km) in length from its starting point at Dublin City Centre to Drogheda, Co. Louth. The highway network follows the rail line in various forms, primarily as regional roads and minor local roads. The roads which, for the main part, are in the immediate vicinity of the Proposed Development are single carriageway roads providing facilities for pedestrians, cyclists, and buses.

There are a number of vehicular crossings along the length of the railway line which are generally provided in the form of bridges. There are also four ‘at-grade’ or ‘level’ crossings at Kilbarrack, Sutton, Cosh and Claremont along the Howth Branch line. There is an additional user worked level crossing South of Donabate to access private lands. The traffic volumes were recorded at Kilbarrack and Sutton, where the total peak traffic movements are 3,096 Passenger Car Units (PCUs).

6.4.2 Proposed Development Zones

Given the length of the Proposed Development, it has been divided into five zones to aid in describing the Proposed Development, the proposed works taking place, the time periods when the works will take place and in identifying the location of impacts. The five zones are set out below in Table 6-5, and are considered in detail in the following section.

Table 6-5 Proposed Development Zones

Zone	Location	Description	Local Authority
Zone A	North of Connolly Station to south of Howth Junction & Donaghmede Station	The area between north of Connolly Station to Howth Junction & Donaghmede Station, including Fairview Depot.	Dublin City Council
Zone B	South of Howth Junction & Donaghmede Station to north of Malahide Viaduct. (Including Howth Branch)	The area between Howth Junction & Donaghmede Station, to north of the Malahide Viaduct, plus the entire Howth Branch. Area includes works within Howth Junction & Donaghmede Station, Clongriffin Station and the Malahide Viaduct.	Fingal County Council
Zone C	North of Malahide viaduct to south of Gormanston Station (Fingal CC border)	The area between north of Malahide Viaduct to south of Gormanston Station. Area includes Donabate, Rush & Lusk, Skerries and Balbriggan Stations.	Fingal County Council
Zone D	South of Gormanston Station (Fingal CC border) to Louth / Meath border	The area between Gormanston Station and the Louth/Meath border (boundary of Louth approx. 1.5km southeast of Drogheda MacBride Station). Area includes Gormanston and Laytown Stations.	Meath County Council
Zone E	Drogheda MacBride Station and surrounds	Drogheda MacBride Station and surrounds including the area between the Dublin Road Bridge (UBK01) to the Louth/Meath border.	Louth County Council

6.4.2.1 Zone A - North of Connolly Station to south of Howth Junction & Donaghmede Station

Image 6-11 Extents of DART+ Coastal North Zone A

Due to its proximity to Dublin City Centre, the surrounding area of Zone A is characterised by an urban and suburban landscape. Zone A consists of five train stations which include Clontarf Road, Killester, Harmonstown, Raheny and Kilbarrack Stations.

Clontarf Road Station is located at the north-eastern edge of Fairview Park. There is a series of regional roads surrounding the station where the R807 connects to the R105 at the junction of Howth Road. There are well lit footways with signalised pedestrian crossings along the main roads surrounding Clontarf Road Station. There is also a series of walking and cycling routes throughout Fairview Park, connecting North Strand Road to Clontarf Road and Howth Road. There are four bus routes that service Clontarf Road Station, enabling multi modal transport options. Clontarf Road and the R105 Fairview act as a bus corridor for 14 bus routes where there is a bus lane for those operating towards the city centre. There is a total of 105 car parking spaces and 20 bicycle parking spaces at Clontarf Road station entrance.

Killester Station is located west of the R105 Howth Road. Access from the R105 Howth Road to Killester Station can be achieved via Middle Third and The Demesne local roads. The R103 Collins Avenue extends to the R105 at Killester Village, 400 meters from the train station. The local roads surrounding the station are characterised as having good pedestrian infrastructure with reduced maximum speed limits. There are also cycle lanes along the R105 Howth Road, partly segregated and partly integrated with bus lanes. There are four bus stops that are serviced by a total of seven bus routes within 400 meters of the train station. These bus stops, and bus lanes provided along the length of Howth Road, encourage trips to be made by more sustainable modes. There are 43 car parking spaces and three bicycle parking spaces allocated for commuters approximately 250m west of the station.

Harmonstown Station is located between two residential areas on its northern and southern edge. Vehicular access is provided via Brookwood Rise and Ennafort Road. The southern aspect of the train station is connected to the R105 Howth Road through Ennafort Park. There is an extensive number of footways within the vicinity of Harmonstown Station as well as a certain amount of cycling infrastructure present within the area. There are four bus stops within 500 meters of the station that are serviced by four bus routes. There is no car parking or designated bicycle parking facilities at the train station, however on-street public parking is available.

Raheny Station is located along the R809 Station Road, running perpendicular to the R105 Howth Road. There are well lit footways with signalised crossing points throughout Station Road. There are cycle lanes along the R105, however they do not extend towards Raheny Station. There are a total of six bus stops within 300 meters of the train station that are serviced by five bus routes. There are two bicycle parking spaces at the train station entrance. There is no car parking provided.

Kilbarrack Station has similar characteristics to that of Harmonstown and Killester Stations, where the railway line is located between two residential areas. The R104 Kilbarrack Road is located 400 meters north of the station. The junction of the R105 Howth Road and R807 James Larkin Road is located 1km south of the station, connected through a series of local roads. There is good quality pedestrian infrastructure along the local roads in the vicinity, with reduced maximum speed limits for safe cycling accessibility. There are no bus stops within the vicinity of the train station, nor are there designated car and bicycle parking facilities.

The railway line within Zone A does not impact the surrounding vehicular or pedestrian permeability. The railway line is elevated above street level between Clontarf Road Station and Collins Avenue, where the crossings are provided in the form of rail bridges. Permeability is achieved between Collins Avenue and Howth Junction & Donaghmede Station as the railway line is set below the street level crossing above.

6.4.2.2 Zone B - South of Howth Junction & Donaghmede Station to Malahide Viaduct (Including Howth Branch)

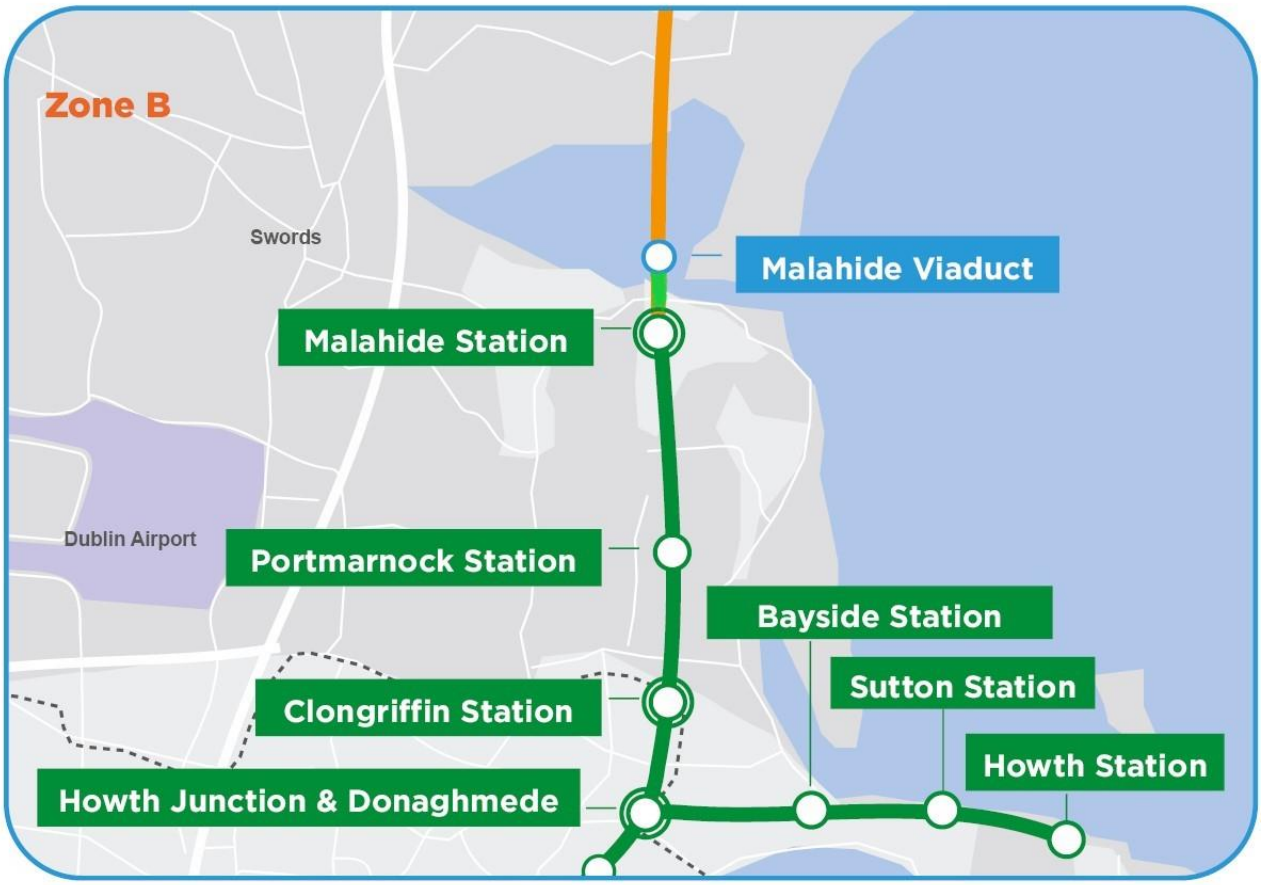


Image 6-12 Extents of DART+ Coastal North Zone B

Zone B consists of seven train stations which include Howth Junction & Donaghmede, Bayside, Sutton, Howth, Clongriffin, Portmarnock and Malahide Stations. This zone is characterised as being a suburban area with a lower residential density than Zone A, while also including pockets of industrial and undeveloped land.

Howth Junction & Donaghmede Station is accessible by car via Kilbarrack Way and Kilbarrack Parade, connecting to the R104 Kilbarrack Road. This road extends to the R105 Howth Road at the eastern edge and extends westwards to Junction 2 of the M50 motorway. There are no cycle lanes along either of Kilbarrack Way or Kilbarrack Parade, however there is an at-grade cycle lane on both sides of Kilbarrack Road. Five bus stops are located within the vicinity of the station, with two bus routes servicing Kilbarrack Road. There are 26 designated car parking spaces at the train station as well as a number of sheltered bicycle parking spaces and bike lockers.

Bayside Station on the Howth Branch line is located between Seagrange Park to the north and Sutton Park to the south. The station is located 800 meters from the R105 Dublin Road, accessible through Sutton Park. There is good quality pedestrian infrastructure along the local roads in the vicinity of the site, with reduced maximum speed limits for safe cycling accessibility. There are pedestrian and cycling routes throughout Seagrange Park, connecting to the R809 Grange Road at its northern edge.

There are no bus stops within the vicinity of the train station, however the bus stops surrounding the station are located along the R105 Dublin Road and R809 Grange Road. There are 9 designated car parking spaces and 10 bicycle parking spaces at the train station.

Sutton Station on the Howth Branch line is located south of Sutton Level Crossing along the R106 Station Road. The R106 intersects the R105 Howth Road at Sutton Cross, 500 meters from the station. There are well lit footways with signalised pedestrian crossings along these main roads, however there is no current cycling infrastructure in the vicinity of the train station. The terminus for the 102 bus, and its variations are located at Sutton Station. There are a total of 4 bus stops within 500 meters from the train station, which are serviced by 4 bus routes. These bus routes operate towards Swords, Balgriffin and Dublin Airport. There are 98 car parking spaces at Sutton Station across two car parks. There is sheltered bicycle parking available at the station, as well as 3 bicycle lockers available to rent.

Howth Station on the Howth Branch line is located adjacent to the R105 Howth Road on its northern edge. This road continues in a loop past Howth Summit and returns to Sutton Cross. There are good quality footways throughout the village and within Howth Pier Park. While there is cycling infrastructure between Sutton cross and Howth village, there are no cycling facilities east of the train station. There are six bus stops within 400 meters that are serviced by 2 bus routes. There are also 14 car parking spaces as well as 7 bicycle parking spaces available at the station.

Clongriffin Station opened in 2010 as part of the Northern Fringe Development Plan and can be accessed via Main Street in Clongriffin. Clongriffin Main Street intersects Hole in the Wall Road at its western edge, which further increases accessibility to the regional road network. There are well lit footways with signalised crossing points throughout the Main Street, however there are no current cycling facilities in the surrounding area of Clongriffin Station. There are 3 bus stops within 220 meters from the station, with one bus servicing (No.15). There is a bus lane both on approach and leaving Clongriffin Station. The square in front of the train station gives access to the underground car park where 400 car parking spaces are located, however it is currently closed until further notice.

Portmarnock Station is surrounded by new housing developments on all sides. The station is located at the southern edge of Station Road. The eastern edge of Station Road links with Coast Road, extending to Portmarnock village while Station Road meets the R124 at its western edge. There are well lit footways with signalised pedestrian crossings along these main roads. Cycling infrastructure is present along Station Road, improving to a raised cycle lane further east in the direction of Portmarnock Village. There is one bus stop located 550 meters from the train station connecting Portmarnock Village to the city centre and Dublin Airport, as well as other areas. The bus stop is serviced by five bus routes. There is a large car park adjacent to the station, with approximately 275 car parking spaces. There is also sheltered bicycle parking and 4 bike lockers available to rent. Facilities at Portmarnock are being enhanced with the installation of a turning circle for a bus and the opportunity for a multi-modal interchange.

Malahide is the most northerly station within Zone B. It is a well populated area with approximately 16,500 inhabitants. The station is located at the northern aspect of the R106 Malahide Road. This road meets the R107 Dublin Road at the junction of Swords Road, which enables vehicular access to and from Dublin City. There are footways throughout the town, however there are few current cycle lanes. There are six bus stops within 500 meters from the train station.

These bus stops are serviced by 11 routes. There are approximately 83 car parking spaces at the station, with sheltered bicycle parking and bike lockers available also.

6.4.2.3 Zone C - Malahide viaduct to south of Gormanston Station (To Fingal / Meath border)

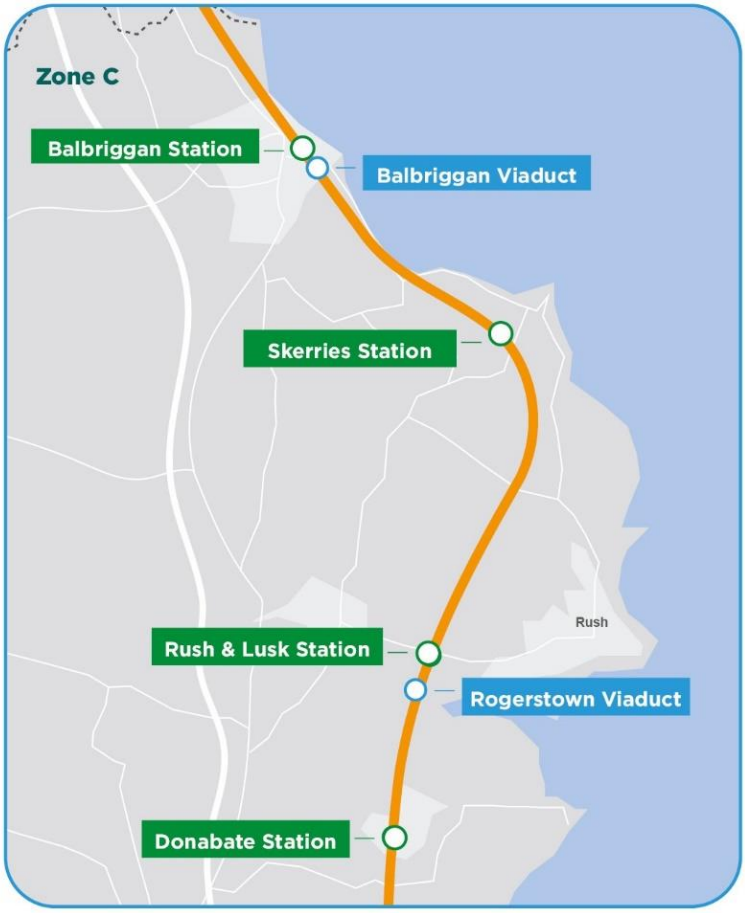


Image 6-13 Extents of DART+ Coastal North Zone C

There are four train stations within Zone C. These stations are currently serviced by Iarnród Éireann Commuter and Intercity operations, as the DART currently terminates at Malahide. The stations within Zone C include Donabate, Skerries, Rush & Lusk and Balbriggan. Zone C extends from north of Malahide viaduct in the Fingal local authority functional area, to the border with County Meath.

Donabate Station is located to the north of Malahide Estuary. The station is connected to the town via the L2170 Main Street. This road links with the R126 which gives access to Junction 4 of the M1 Motorway. There are footways on both sides of the street in the vicinity of the train station, however there is only one signalised crossing point throughout the village. The village has significant newly developed housing estates that are within walking distance to the train station. A number of bus services connect the nearby seaside area of Portrane to Donabate, and further towards Dublin City Centre. There are five bus stops within 330 meters, serving five bus routes. There is a total of 351 car parking spaces, as well as sheltered bicycle parking and 6 bike lockers available to rent within the station.

Rush & Lusk Station is located equidistant from the two villages. The R128 Station Road runs between Rush and Lusk and extends in a northerly direction towards Skerries. The R127 also increases vehicular accessibility between Lusk, Skerries and Balbriggan. There are footways on one side of the R128 throughout its entirety, connecting the two villages. There is currently no cycling infrastructure along this road, however there is a limited amount of cycle lanes within Rush and Lusk. There are five bus stops within 320 meters from the station, serviced by five bus routes. There is a total of 432 car parking spaces, as well as sheltered bicycle parking and seven bike lockers available to rent within the station.

Skerries Station is located at the southern edge of the town. The R127 Dublin Road is located east of the station, enabling vehicular connectivity to the centre of the town. There are pedestrian footways located between the train station and the town centre, however there is no direct access to cycling infrastructure throughout the town. There are three bus stops within 400 meters from the station that are serviced by five bus routes. There are 125 car parking spaces at the station, as well as sheltered bicycle parking and 8 bike lockers available to rent.

Balbriggan Station is located north along the coastline from Skerries and can be accessed by car via the R132 Drogheda Street. The R127 meets the R132 at the junction of Old Market Green and Dublin Street, extending south to Skerries. There are pedestrian footways throughout the town, as well as a recent development of cycleways along newly constructed roads both within and on the outskirts of the town. There are four bus stops within 310 meters from the station that are serviced by 6 bus routes. Two of the bus stops are located at the train station. There are approximately 98 car parking spaces at the station as well as sheltered bicycle parking and 9 bike lockers available to rent.

6.4.2.4 Zone D - South of Gormanston Station (Fingal border) to Louth / Meath border

Image 6-14 Extents of DART+ Coastal North Zone D

Zone D consists of two train stations. Gormanston and Laytown Stations are both located within Co. Meath. Both stations are currently serviced by Irish Rail Commuter and Intercity operations.

Gormanston Station is located 500 meters from the Dublin / Meath border, within Co. Meath. This area is set in a rural landscape, with the lowest residential density of all train stations associated with DART+ Coastal North development. The station is accessed by a local road which connects to the R132. The R132 runs parallel to the coastline, connecting the coastal towns between North Co. Dublin, Meath, and Louth. There is a footway on one side of the access road to Gormanston Station. There is also a footway on one side of the L1616 Flemington Road at Gormanston village. There is no cycling infrastructure in the vicinity of Gormanston Station. There is one bus stop approximately 410 meters from the station, with two buses operating along the R132. There are 116 car parking spaces at the station with sheltered bicycle parking also available.

Laytown is a coastal town in Co. Meath. The R150 is located to the south of the station, which extends throughout the town and in a northerly direction towards Drogheda and in a westerly direction to Julianstown village. The train station is connected to the centre of the town via the R150 Strand Road. There are pedestrian footways on the street in the direction of the village, however there is no cycling infrastructure throughout. There are two bus stops within 200 meters of the station, served by four bus routes. There are 24 car parking spaces at the station and there is also sheltered bicycle parking available.

6.4.2.5 Zone E – Drogheda MacBride Station and surrounds

Image 6-15 Extents of DART+ Coastal North Zone E

Drogheda MacBride Station is located southeast of Drogheda Town Centre in Co. Louth. The station is located along the R132 Dublin Road which extends north to the town and south through Balbriggan. The centre of Drogheda is within walking distance of Drogheda MacBride Station, where a 12-minute walk leads you to the main crossing point of the River Boyne at St. Mary's Bridge. There are footways in the vicinity of the station, however there is no current cycling infrastructure throughout the town. There are four bus stops within 420 meters from the station with four bus routes There are approximately 300 car parking spaces at the station, as well as good quality cycle parking facilities.

6.4.3 Baseline Vehicular Flows

To understand the level of existing traffic on the road network within the study area a review of the available baseline data has been undertaken. A combination of survey data and models was used to inform the baseline assessment, as follows:

- 2019 Dublin Local Area Model (DLAM[2]);
- 2019 East Regional Model (ERM[3]); and
- Supplementary traffic count surveys were conducted in May 2022 and May 2023 in the direct study area for the purposes of the construction and operational impact assessment.

It is important to understand the baseline traffic flows along the length of the rail line being developed to gain an understanding of where changes as a result of the Proposed Development are likely to have an impact and where appropriate mitigation may be required.

6.4.3.1 Dublin Local Area Model (DLAM)

Image 6-17 illustrates the modelled AM and PM peak hours baseline 2019 traffic flows in the DLAM area.

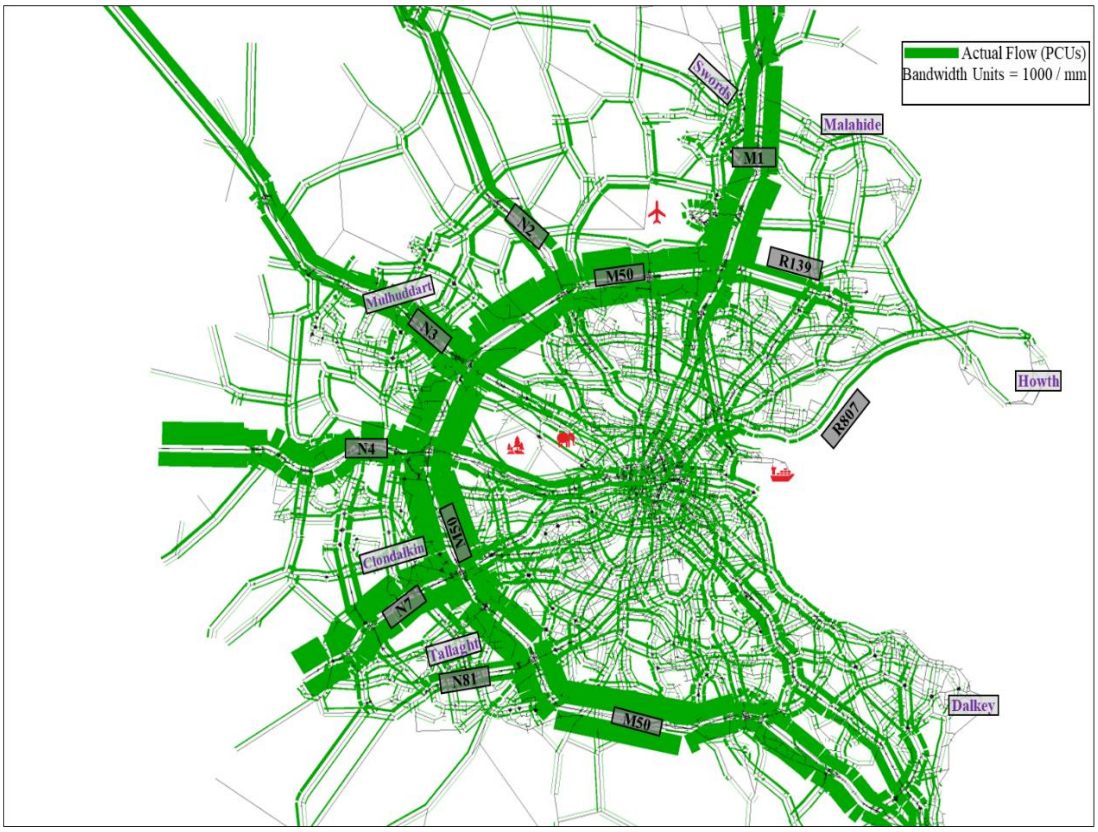


Image 6-16 2019 Base Year Morning Peak from DLAM

[2] NTA Model developed as part of BusConnects for the purpose of robust EIAR analysis.

[3] https://www.nationaltransport.ie/wp-content/uploads/2022/09/ERM-Model-Development-Report.pdf

Image 6-17 2019 Base Year Evening Peak from DLAM

6.4.3.2 East Regional Model (ERM)

Image 6-18 presents the extent of ERM model (2019) and the Image 6-19 illustrate the modelled AM peak hour baseline 2019 traffic flows in along North of Dublin area. More information on the assessment methodology and the development of the ERM is provided in Section 6.3.3.3.

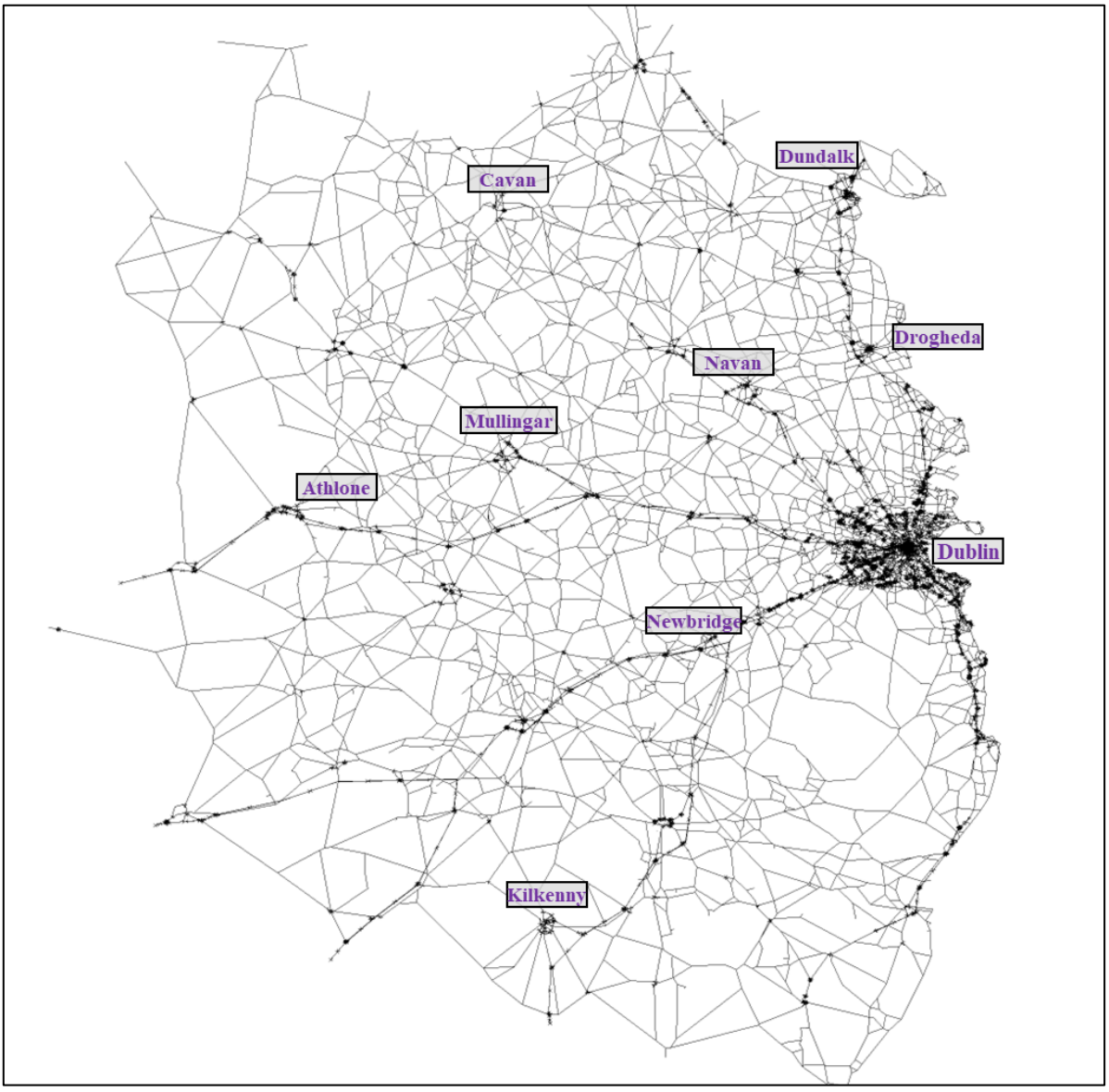


Image 6-18 2019 ERM Network Extent

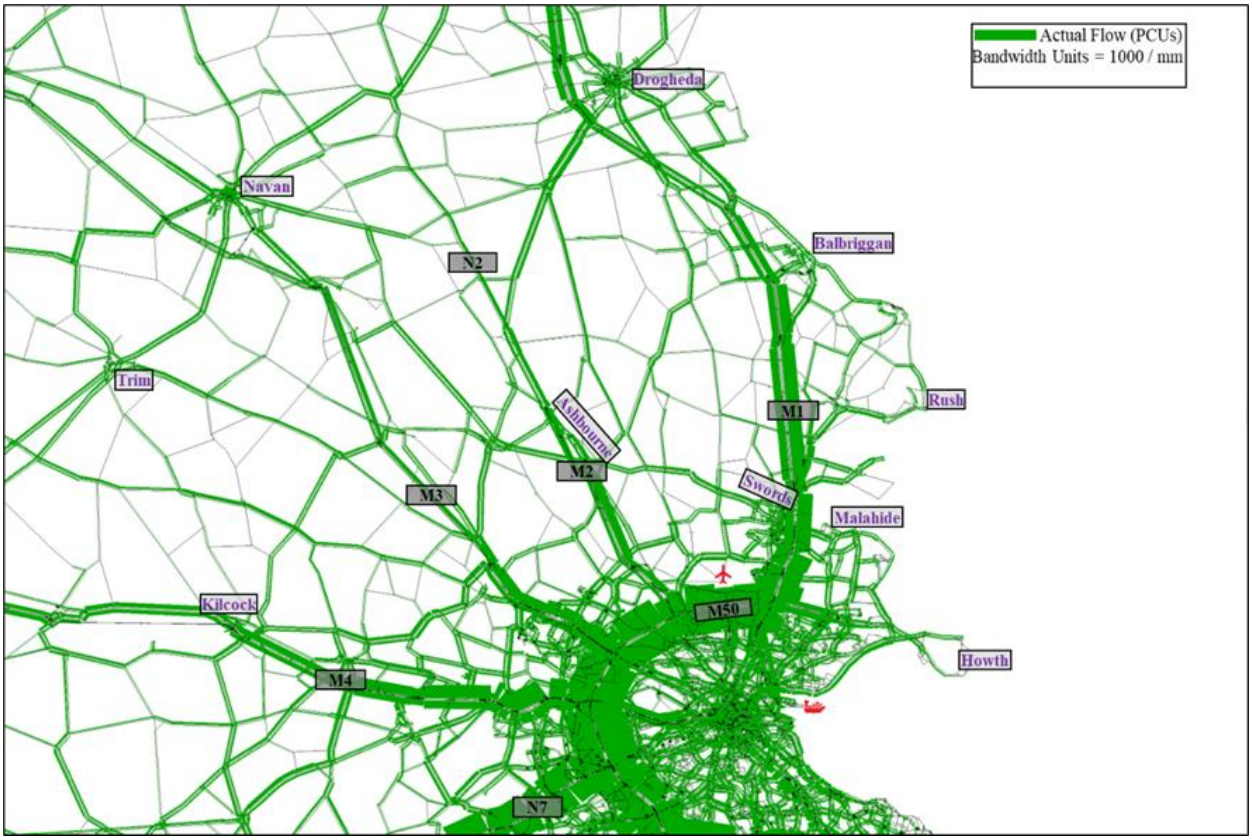


Image 6-19 2019 Base Year Morning Peak from ERM

6.4.3.3 Traffic Count Survey Data

6.4.3.3.1 Howth Branch

Traffic count surveys were carried out at the four level crossing locations on the Howth Branch line as well as at the junctions up and down stream of the Baldoyle Road and Sutton level crossings Note that Baldoyle Road level crossing is hereafter referred to as Kilbarrack level crossing.

Table 6-6 Level Crossing Locations

Site No.	Arm Names	Arms	Junction Type
1	Baldoyle Road (Kilbarrack) Level Crossing	2	Level Crossing
2	Sutton Level Crossing	2	Level Crossing
3	Cosh Level Crossing	2	Level Crossing
4	Claremount Level Crossing	2	Level Crossing

The traffic survey data was used to undertake the assessment and understand the operational impact on vehicles and queueing in the surrounding area. Traffic surveys were carried out on Tuesday 24 May 2022 and Thursday 11 May 2023, in line with best practise methodology for survey day selection issued by TII.

These included classified vehicle junction turning count surveys over a 14-hour time period between 0600 and 2000 at the junctions within the study area and also at the level crossings within the study area. The data also included queue length surveys and pedestrian count surveys.

The AM Peak Hour was determined to occur between 0800 and 0900 and the PM Peak Hour between 1730 and 1830. These are generally the busiest periods on the road network. Therefore, the junctions were assessed for these time periods, in line with best practise methodology for traffic assessments.

Table 6-7 2022 and 2023 AM & PM Peak Hour Traffic Flow Howth Branch

Junction Counts		2022 AM Peak Hour	2022 PM Peak Hour	2023 AM Peak Hour	2023 PM Peak Hour
Kilbarrack (917)	Northbound	303	438	366	472
	Southbound	503	334	435	345
Sutton (916)	Northbound	385	379	406	401
	Southbound	543	420	471	358
Cosh (915)	Northbound	23	48	27	27
	Southbound	25	24	21	29
Claremount (913)	Northbound	4	10	2	5
	Southbound	8	2	12	13

Kilbarrack (917) and Sutton (916) Level Crossings are located along strategic roads and therefore have much higher volumes of traffic with the greatest potential to cause delays. Cosh (915) and Claremount (913) Level Crossings have a much lower level of traffic volume as they are mainly used for local access.

6.4.3.3.2 Drogheda

The traffic survey data was used to undertake the assessment and understand the construction impact on vehicles and queueing in the surrounding area. Traffic data surveys were carried out on Thursday 11 May 2023 at three locations in Drogheda, Image 6-20. These included classified vehicle junction turning count surveys over a 14-hour time period between 0600 and 2000. The data also included queue length surveys and pedestrian count surveys.

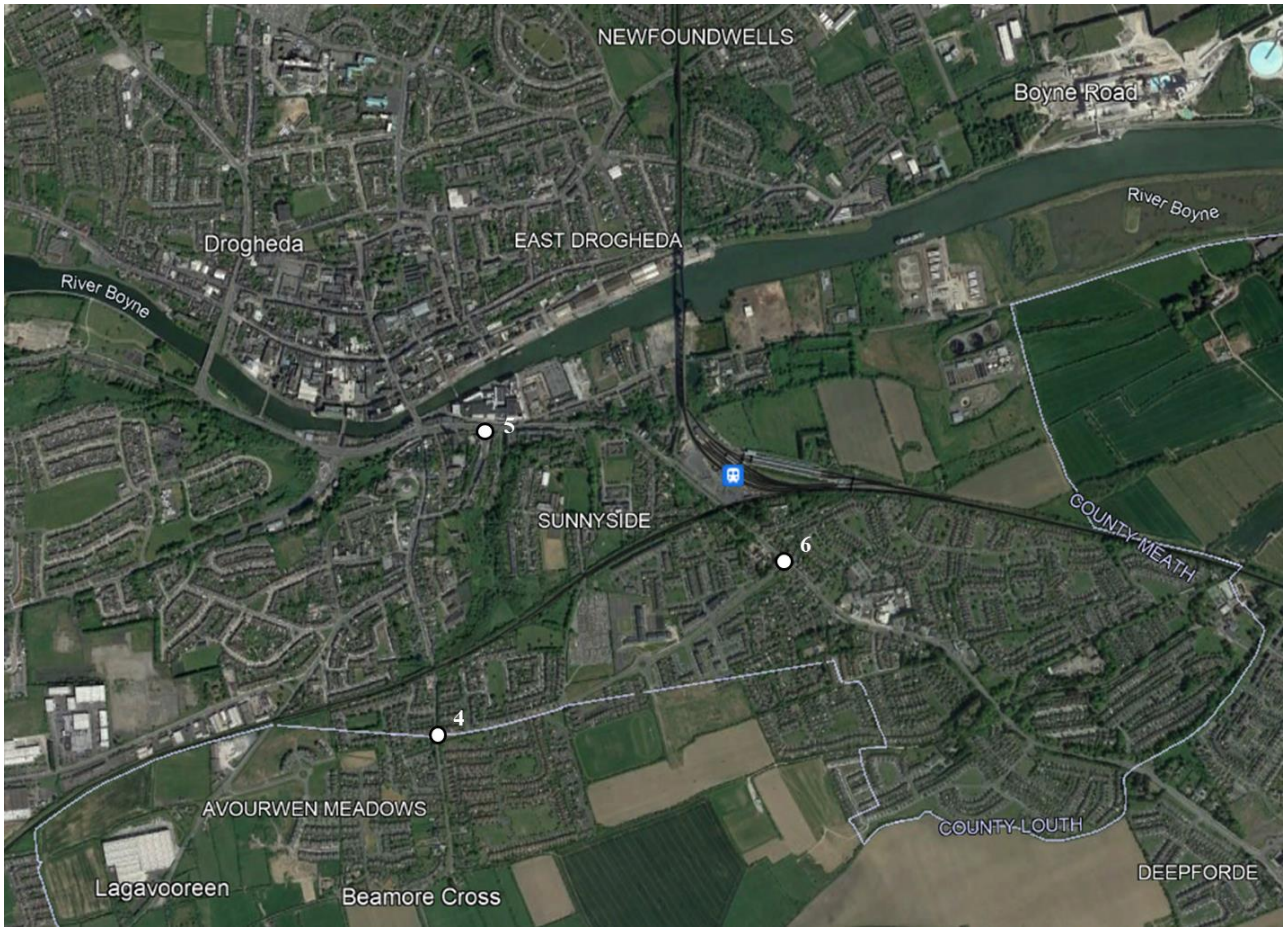


Image 6-20 Traffic count locations Drogheda

The AM Peak Hour was determined to occur between 0800 and 0900 and the PM Peak Hour between 1730 and 1830, refer to Table 6-8.

Table 6-8 2023 AM & PM Peak Hour Traffic Flow Drogheda

Junction Counts		2023 AM Peak Hour	2023 PM Peak Hour
Breamore Road	Northbound	719	605
	Southbound	469	473
R132 Dublin Road	Northbound	534	394
	Southbound	715	743
R132 Dublin Road / Mary Street	Eastbound	594	590
	Westbound	855	808

6.4.3.3.3 Malahide

The traffic survey data was used to undertake the assessment and understand the construction impact on vehicles in the surrounding area. Traffic data surveys were carried out on Tuesday 14 May 2024 at three locations in Malahide, see Image 6-21. These included classified vehicle junction turning count surveys over a 14-hour time period between 0600 and 2000.

Image 6-21 Traffic count locations Malahide

The AM Peak Hour was determined to occur between 0800 and 0900 and the PM Peak Hour between 1730 and 1830, refer to Table 6-9.

Table 6-9 2024 AM & PM Peak Hour Traffic Flow Malahide

Junction Counts		2024 AM Peak Hour	2024 PM Peak Hour
Yellow Walls Road	Eastbound	338	275
	Westbound	241	287
Sea Road	Northbound	392	231
	Southbound	242	224
Caves Strand / The Haven	Eastbound	197	186
	Westbound	172	196

6.4.4 Walking and Cycling

Access to stations on foot and by bicycle is an important factor in order to increase the use of rail services in commuters' daily travel modes. High quality pedestrian and cycling infrastructure encourages those living near frequent public transport routes to use the service. A review has been carried out to establish the quality of walking and cycling infrastructure that surrounds each of the stations.

The characteristics of the surrounding pedestrian and cycling infrastructure vary for each station. Large sections of the rail line are highly accessible by walking and cycling, however there are some short sections with no formalised cycle infrastructure. Well-connected active travel links help to reduce trips to / from stations by private car.

The rail network between Clontarf Road and Howth Station runs adjacent to a series of on street cycle lanes with connections to the Clontarf to Howth Coastal Route. This provides good quality active travel connections throughout the surrounding areas. The pedestrian facilities can be characterised by the stations' surrounding residential densities. The areas in which the train stations are located with higher residential densities generally have better quality pedestrian infrastructure than those in rural settings.

A series of bridges and underpasses act as crossing points with adjacent footways between Clontarf Road and Bayside Stations. There are a number of level crossing points between Bayside Station and Howth Station, where pedestrians are required to cross 'at-grade', alongside vehicles on a narrow road.

The quality of pedestrian and cycling facilities reduce at stations north of Donabate. The surrounding streets are characterised as having no formalised cycle connectivity, as well as fragmented pedestrian connectivity. Pedestrian access to Drogheda MacBride Station is achieved via footways, however there are currently no formalised cycle facilities within the station's surroundings.

6.4.4.1 Review of existing Footways/Greenways/Cycleways at Stations

In Table 6-10, a review of the existing footways, greenways and cycleways surrounding stations served by the Proposed Development indicates that Zones A and B have good cycle and walking connectivity to stations. Zones C, D and E have limited provision of formalised cycling infrastructure surrounding the stations.

Table 6-10 Footways/Greenways/Cycleways at Stations

Zone	Station	Footways/Greenways/Cycleways
A	Clontarf Road	There is a 'Cycle Trail / Greenway' that runs the length of Fairview Park on the north-western edge of the train station. There are also 'Cycle Tracks-separated from road' within the vicinity, adjacent to Fairview Park and Alfie Byrne Road. There are existing footways which provide pedestrian connections to the station from the R807 Clontarf Road.
	Killester	On the south-eastern edge of the train line at Killester Station, a 'Cycle Lane (even within bus lane)' runs parallel along Howth Road. This cycle lane extends in both a north-easterly and south-westerly direction, however there are southbound breaks that merge with the bus lane. There are no cycle lanes directly servicing the train station. There are existing footways which provide pedestrian connections to the station along local access roads.
	Harmonstown	On the south-eastern edge of the train line at Harmonstown Station, a 'Cycle Lane (within bus lane)' runs parallel along Howth Road. This cycle lane extends in both a north-easterly and south-westerly direction, however there are southbound breaks that merge with the bus lane. There are no cycle lanes connecting directly to the train station. There are existing footways which provide pedestrian connections to the station, with a laneway enabling access.
	Raheny	There are no cycleways directly adjacent to Raheny Station, however a 'Cycle Lane (within bus lane)' runs parallel to the railway line along Howth Road. This cycle lane extends in both a north-easterly and south-westerly direction, however there are southbound breaks that merge with the bus lane. There are no cycle lanes connecting directly to the train station. There are existing footways which provide pedestrian connections to the station along the R809 Station Road.
	Kilbarrack	There is no direct access to Kilbarrack Station via formalised or segregated cycling infrastructure. However, connectivity can be achieved using local roads extending in a south easterly direction to the Clontarf to Howth Coastal Cycle Route. There are existing footways which provide pedestrian connections to the station.
B	Howth Junction & Donaghmede	A 'Cycle Lane (within Bus Lane)' along Kilbarrack Road connects the Clontarf to Howth Coastal Route to the train station. This cycle lane runs on north-west/south-east axis. There are existing footways which provide pedestrian connections from the R104 Kilbarrack Road to the station.
	Bayside	On the northern aspect of Bayside Station, a footway increases accessibility through Seagrange Park. This provides connectivity to the 'Cycle Lane (within Bus Lane)' along both sides of Willie Nolan Road. The Clontarf to Howth Coastal Cycle Route is located 750 meters in a southerly direction. There are existing footways which provide pedestrian connections to the station throughout Sutton Park.
	Sutton	A 'Secondary Cycle Lane' is located at the south-eastern end of Station Road, along the R105 Dublin Road and Howth Road. This cycle lane provides safe accessibility from Howth village, as well as the Clontarf to Howth Coastal Route. There are existing footways which provide pedestrian connections to the station along Station Road.
	Howth	Howth Station is located at the eastern end of a 'Secondary Cycle Lane,' connecting to the Clontarf to Howth Coastal Route. This cycle route and footway increases local connectivity to neighbouring residential areas. There are existing footways which provide pedestrian connections to the station.
	Clongriffin	There is currently no access via greenways or cycleways. There is a segregated cycle track along Myrtle Close on the eastern edge of the railway line. There is a Cycle Track (separated from the road) approximately 500 meters to the west along Clongriffin Park

Zone	Station	Footways/Greenways/Cycleways
		Avenue, extending to Hole In The Wall Road. There are existing footways which provide pedestrian connections to the station.
	Portmarnock	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station.
	Malahide	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station.
C	Donabate	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station.
	Rush & Lusk	There are currently no greenways or cycleways located within the vicinity of the train station. There are a limited number of cycle lanes in Lusk Village, and a singular cycle track in Rush. There are existing footways which provide pedestrian connections to the station.
	Skerries	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station.
	Balbriggan	There are currently no greenways or cycleways enabling direct access to the train station. However, there are a number of cycle tracks, cycle lanes throughout the town along Drogheda Street, as well as some of the outer relief and link roads. There are existing footways which provide pedestrian connections to the station.
D	Gormanston	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station.
	Laytown	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station
E	Drogheda (MacBride)	There are currently no greenways or cycleways located within the vicinity of the train station. There are existing footways which provide pedestrian connections to the station

6.4.4.1.1 Proposed Cycle Facilities

A number of proposed cycle routes have been outlined within the GDA Cycle Network Plan (NTA, 2022) and CycleConnects: Ireland's Cycle Network (NTA, 2022) in respect Drogheda. The hierarchy of the cycle network will be outlined as follows under both plans:

- Primary Radial;
- Primary Orbital;
- Secondary;
- Greenway – Utility;
- Inter-Urban;
- Feeder;
- Greenway – Leisure; and
- Further Study

The maps below illustrate the extent of the proposed walking and cycle network throughout the development with a phased implementation until 2030.

Dublin City Centre Area

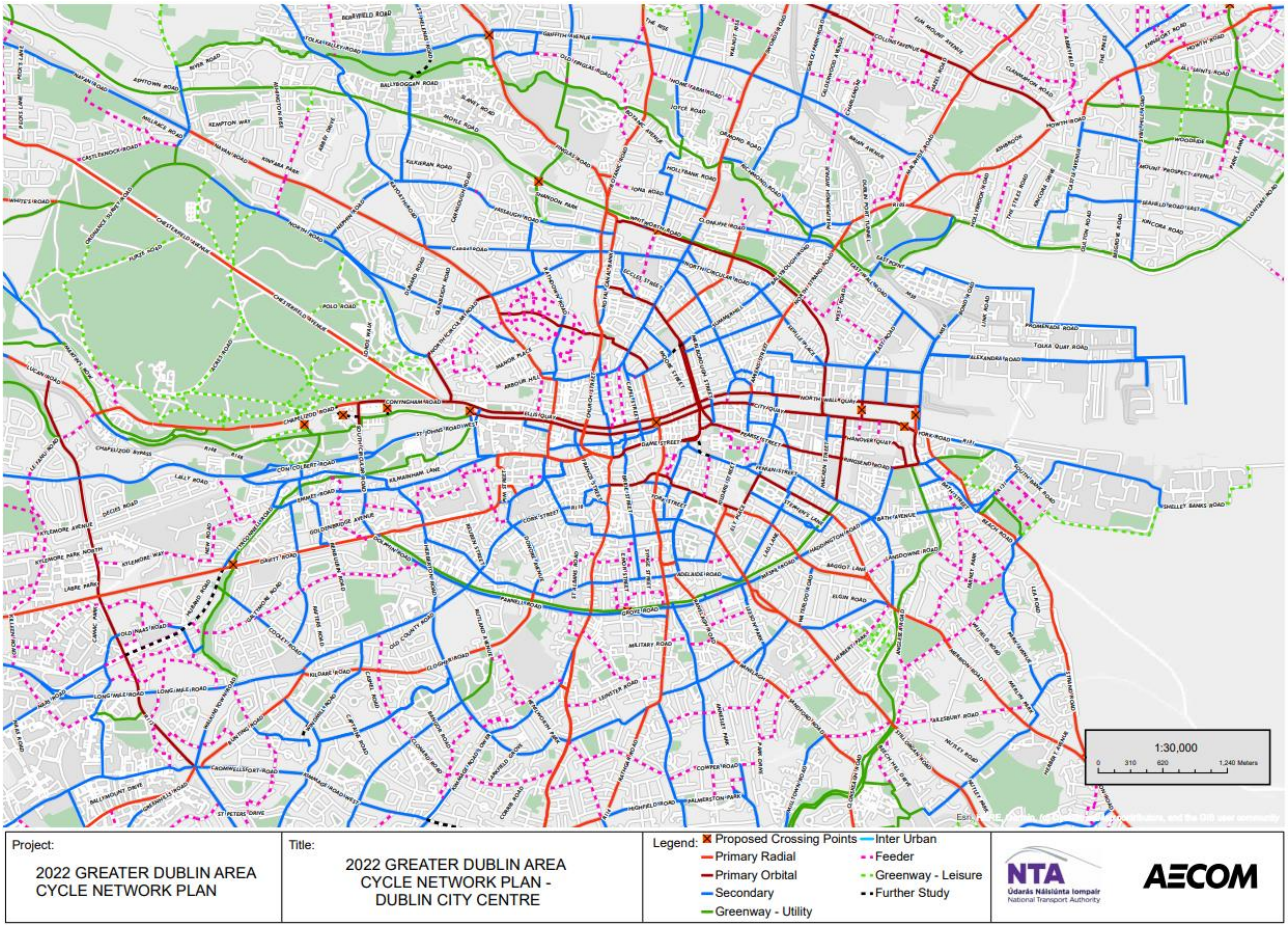


Image 6-22 Proposed Cycle Network Dublin City Centre

There is a considerable amount of proposed cycle routes throughout the Greater Dublin Area. Dublin City Centre will have a well-connected cycle network through connections made between primary and secondary cycle routes.

North-East Dublin Area

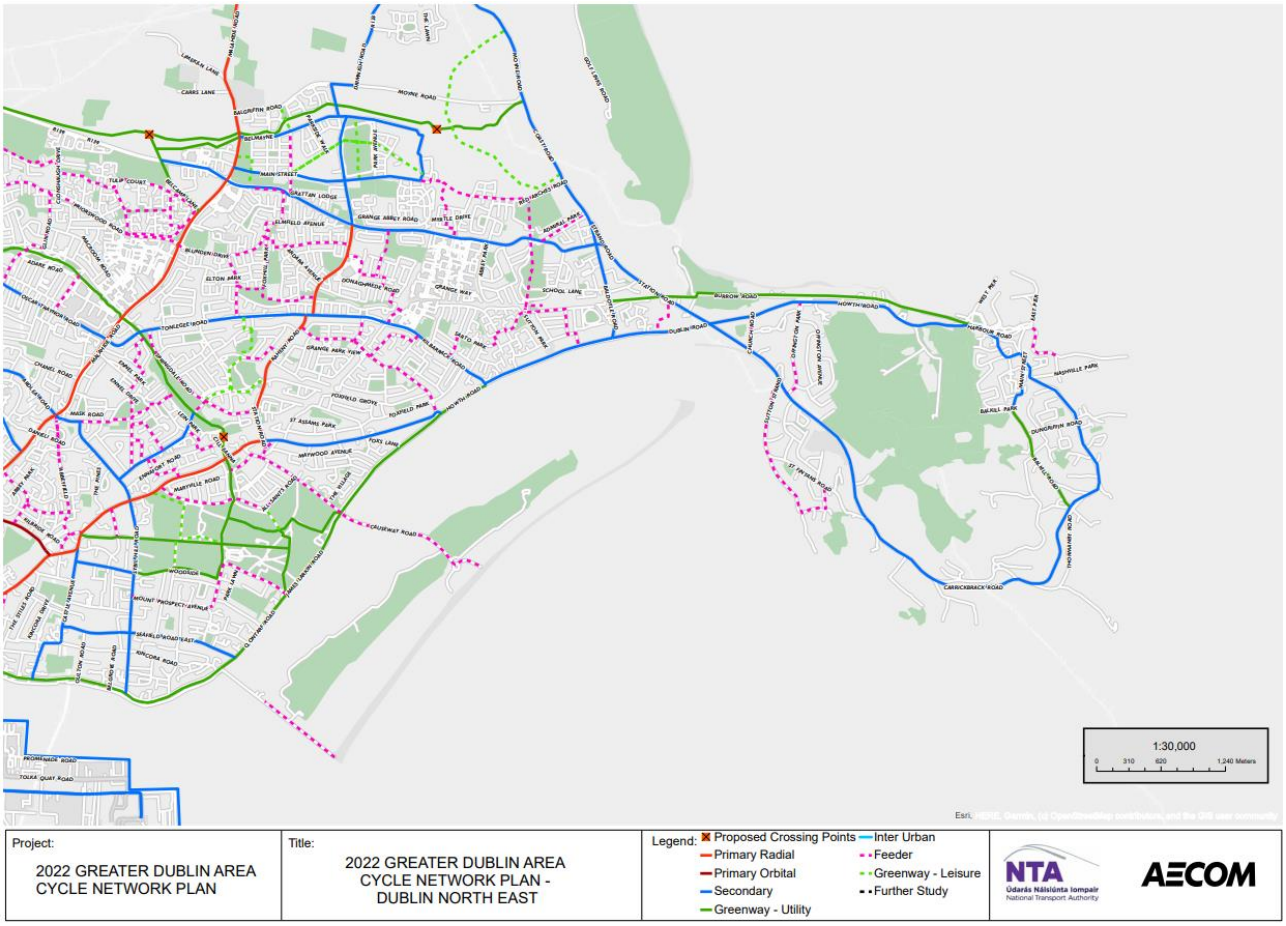


Image 6-23 Proposed Cycle Network Dublin North-East

There is a series of primary radial and secondary cycle routes, as well as greenways that form a network throughout Dublin's north-east suburbs. The Dublin North-East area is characterised by a number of interconnected greenways and secondary cycle routes, such as the Clontarf to Howth Cycle Route. This route extends throughout Howth Peninsula towards the summit. The Secondary cycle route and Greenway connects Howth and Portmarnock via Strand Road and Coast Road and continues north along a Secondary cycle route towards Malahide.

Malahide Area

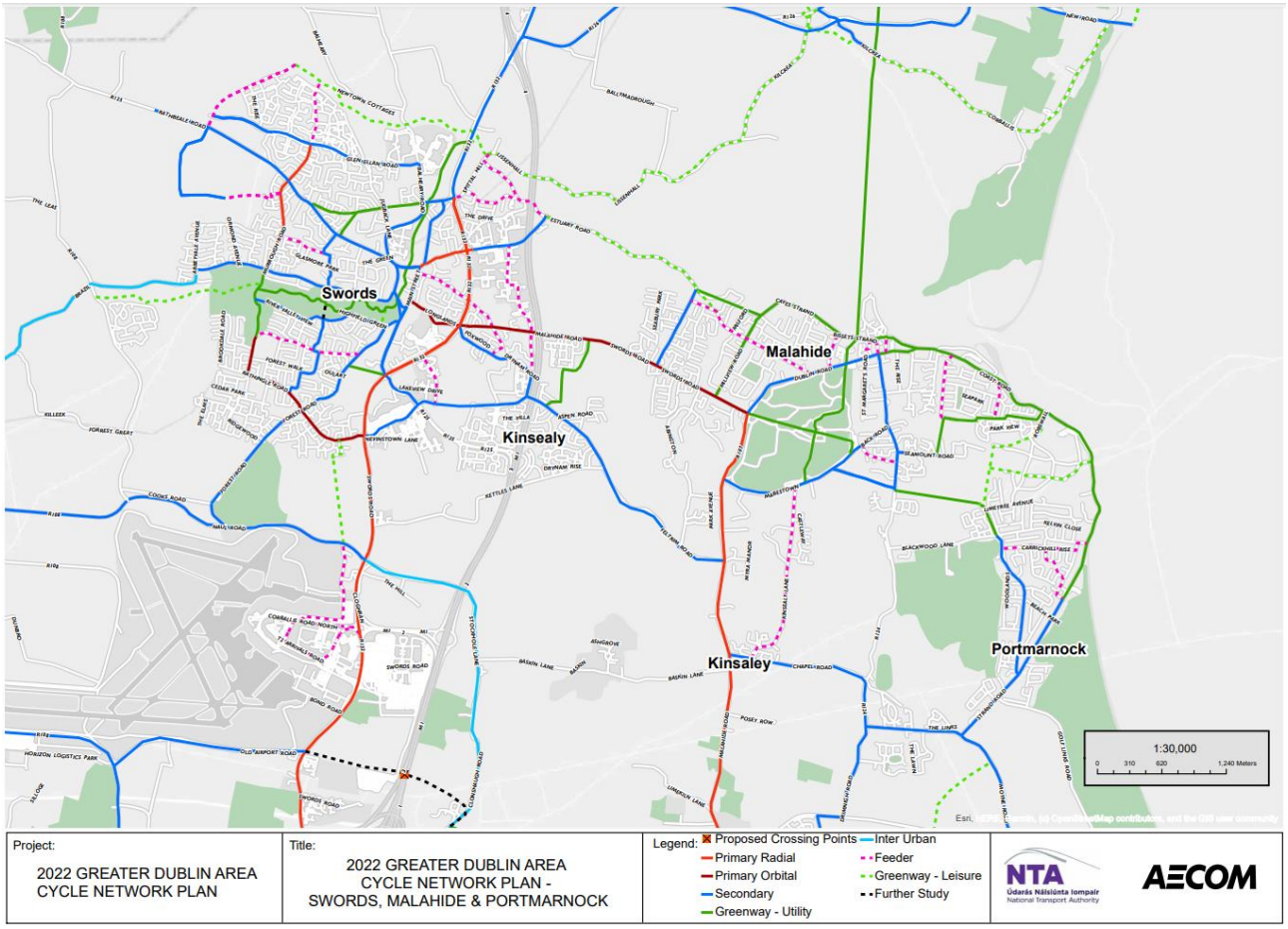


Image 6-24 Proposed Cycle Network Swords & Malahide

The proposed cycle network in the Malahide area consists of Primary Radial and Secondary cycle routes, as well as Greenways. The proposed (and permitted) Broadmeadow Way Greenway will be connected to Donabate via a route across the Malahide Estuary. This cycle route will increase walking and cycling connectivity between Zones B and C of the Proposed Development.

Lusk, Rush & Donabate

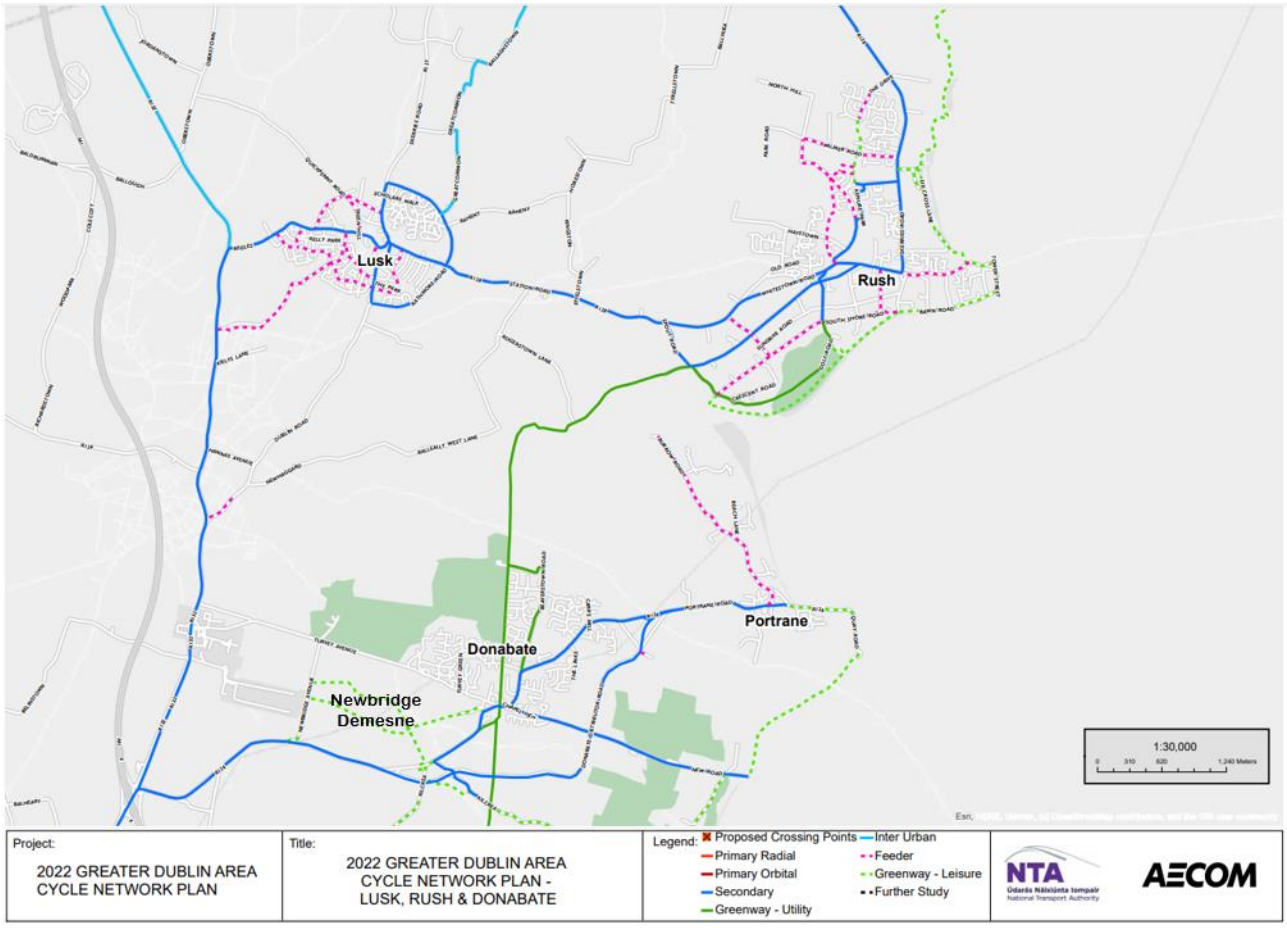


Image 6-25 Proposed Cycle Network Lusk, Rush & Donabate

Considering there is no current cycle infrastructure throughout Donabate Town, developments in the Secondary and Greenway cycle routes should promote the use of sustainable modes. The proposed Broadmeadow Way Greenway will extend from the Malahide Estuary, connecting to both Newbridge Demesne and Donabate. Further infrastructure will be constructed to connect the cycle routes from Donabate to Rush and Lusk where a greenway secondary cycle route will connect the villages.

Balbriggan & Skerries Area

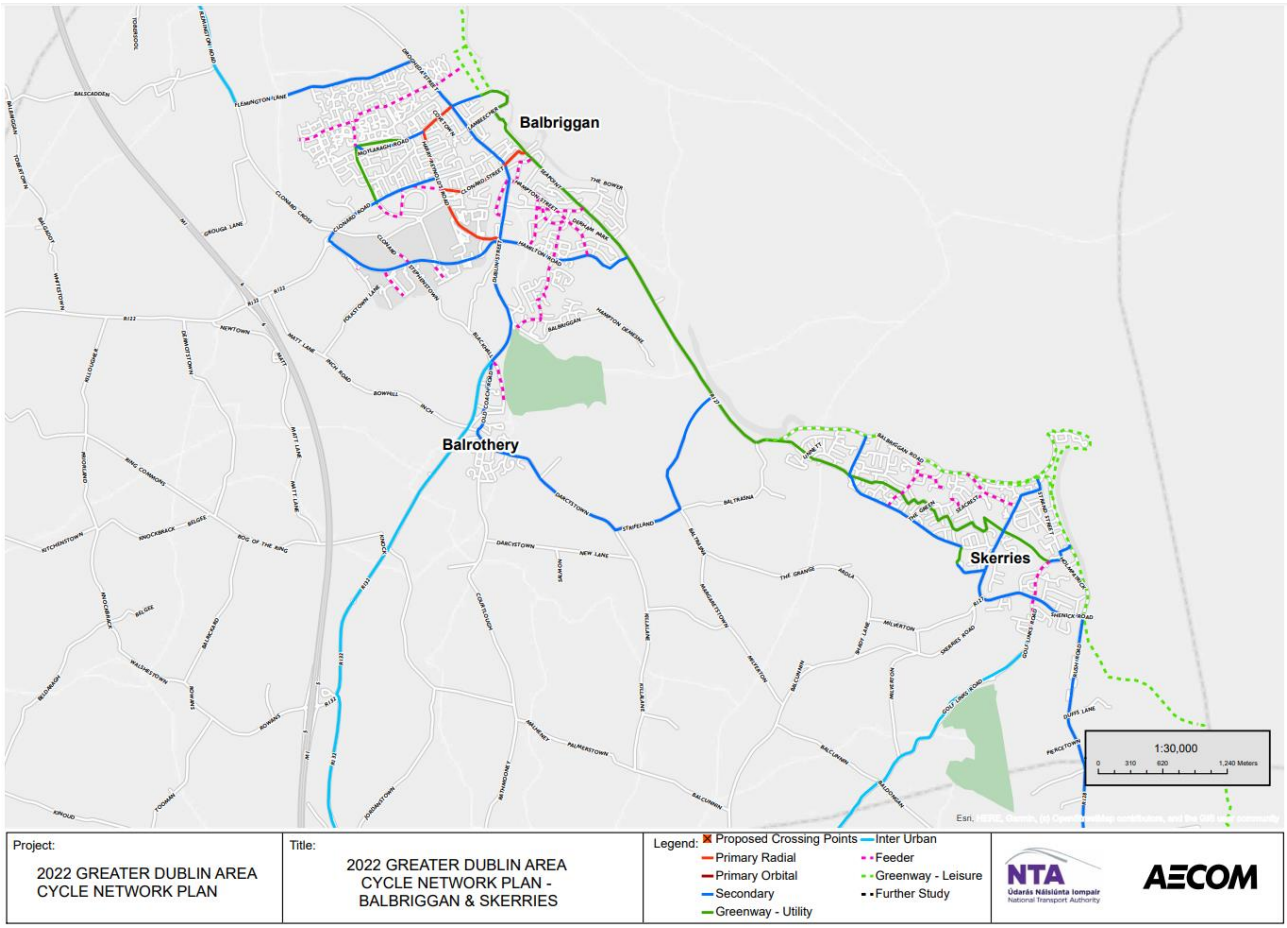


Image 6-26 Proposed Cycle Network Balbriggan & Skerries

A proposed Greenway will extend from Portmarnock in Image 6-24 along the coast through Balbriggan in Image 6-26 towards Drogheda. The Fingal Coastal Way is a proposed greenway extending from Newbridge Demesne in Donabate to the Fingal county boundary, north of Balbriggan. While this Fingal Coastal Way increases accessible sustainable transport options throughout Dublin, there is also a proposed network of Primary, Secondary and feeder cycle routes throughout the seaside towns and villages of Balbriggan and Skerries.

Drogheda Area

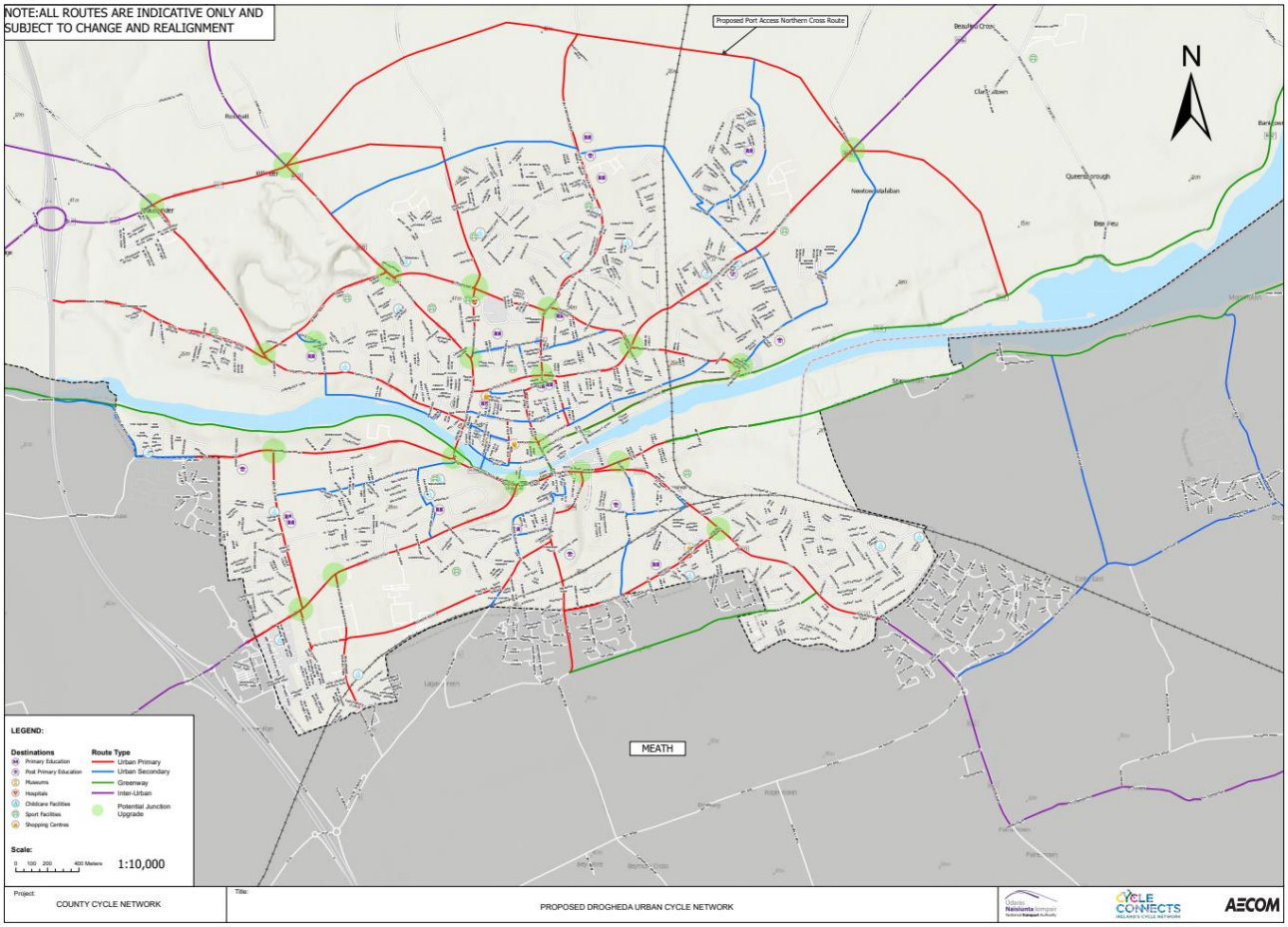


Image 6-27 Proposed Drogheda Urban Cycle Network

There is currently a lack of cycle infrastructure throughout Drogheda Town and its surrounding areas. Image 6-27 illustrates the proposed network development throughout the town. This will also be connected to other towns and villages through the network of Inter-Urban cycle routes and Greenways. An urban primary cycle route has been proposed adjacent to the station along the R132 Dublin Road, extending both in a southerly direction, and northerly direction towards the centre of the town.

6.4.4.2 Pedestrian and Cyclist Counts

Pedestrian Count Surveys were carried out on Thursday 11 May 2023, and previously on Tuesday 24 May 2022 at the four level crossings on the Howth Branch, as detailed in Table 6-11. The surveys were carried out between 06:00-20:00, with data recorded at 15-minute intervals.

Table 6-11 Pedestrian Count Locations

Site No.	Arm Names	Latitude	Longitude	Arms	Junction Type
1	Baldoyle Road (Kilbarrack) Level Crossing	53.391786 0.0	-6.124634	2	Level Crossing
2	Sutton Level Crossing	53.392023 0.0	-6.117216	2	Level Crossing
3	Cosh Level Crossing	53.391965 0.0	-6.084524	2	Level Crossing
4	Claremount Level Crossing	53.390584 0.0	-6.084524	2	Level Crossing

The four survey locations are shown below in Image 6-28.

Image 6-28 Locations of Pedestrian Counts

At each location, the following six movements were recorded:

- Pedestrians walking along the footway on each side of the road in each direction (4 no. counts); and
- Pedestrians crossing the road in each direction (2 no. counts).

Pedestrians were classified into the following categories:

- Child < 5;
- Child < 16;
- Adult;
- Elderly; and
- Disabled.

6.4.4.2.1 Baldoyle Road (Kilbarrack) Level Crossing (XQ001) Pedestrian Assessment

There are pedestrian footways on both sides of Warrenhouse Road and Baldoyle Road, running the full length of both roads. These footways also cross the level crossing. In 2022 surveys, 616 pedestrians per day cross between 06:00 and 20:00, of which 14% of them are children under the age of 16. In 2023, the number of pedestrian crossings per day is 524 and 4% of those are children.

6.4.4.2.2 Sutton Level Crossing (XQ002) Pedestrian Assessment

There are pedestrian footways running the full length on both sides of Station Road. These footways also cross the Sutton (916) Level Crossing. Sutton Train Station is located adjacent to the level crossing, which would attract pedestrians and cyclists. Fingal County Council are proposing plans to develop the Sutton to Malahide Pedestrian and Cycle Scheme. At this stage, the preferred option for the scheme development is to cross the rail line at the Sutton (916) Level Crossing. This option may require land take as the area is constrained on both sides by private residential and commercial properties. The level crossing itself is also constrained in terms of any possibilities to widen it to construct the required cycling infrastructure. An alternative option along Lauder's Lane and the coastline may need to be considered. In 2022 surveys, 921 pedestrians per day cross between 06:00 and 20:00, of which 11% of them are children under the age of 16. In 2023, the number of pedestrian crossings per day is 905 and 31% of those are children.

6.4.4.2.3 Cosh Level Crossing (XQ003) Pedestrian Assessment

There is only a pedestrian footway on the west side of Lauder's Lane running the full length of the road. There is also a footway on the southern side of Burrow Road, north of the level crossing. Sutton Golf Course is divided by the railway line, with the crossing providing the only way to get between the two sections of the course. As a result, golfers use this crossing regularly throughout the day. There is a footway on both sides of Cosh Level Crossing. In 2022 surveys, 510 pedestrians per day cross between 06:00 and 20:00. In 2023, the number of pedestrian crossings per day is 521.

6.4.4.2.4 Claremont (913) Level Crossing (XQ004) Pedestrian Assessment

The Howth Road has a pedestrian footway on both sides of the road running throughout. This footway also crosses the Claremont Level Crossing on both sides. The private access road to the north of Claremont Level Crossing has no pedestrian facilities along it. Of all four of the level crossings this is the least used by pedestrians as it provides access only to a small number of residential units. In 2022 surveys, 97 pedestrians per day cross between 06:00 and 20:00. In 2023, the number of pedestrian crossings per day is 57.

6.4.5 Public Transport

6.4.5.1 Bus

There are a vast number of bus services located within reasonable walking distance of the 'at grade' crossings, at the stations, and provided within the study area.

Table 6-12 Existing Bus Services in the Study Area

Zone	Structure Name	Road / Bridge	Number of Current Bus Routes	Number of Future Bus Routes
Zone A	No structural interventions within this zone	No structural interventions within this zone	No structural interventions within this zone	No structural interventions within this zone
Zone B	OBB17A & OBQ0	Howth Junction and Donaghmede Footbridge	None	None
	UBB30 – Malahide Viaduct	Malahide Viaduct	None	None
Zone C	OBB32A	Donabate Bypass	None	None
	OBB33A	Donabate Footbridge	None	None
	OBB35	Beaverstown Golf Club	None	None
	OBB38	Rogerstown Lane	None	None
	OBB38A	Rush & Lusk Footbridge	None	None
	OBB39	Rush & Lusk Roadbridge	33, 33A, 33E, 33X, 533	L85, X76
	OBB41	Kingstown/Public Road	None	None
	OBB44	Tyrrelstown / Public Road	None	None
	OBB46	Baldongan	None	None
	OBB47	Skerries Golf Club	None	None
	OBB49	Golf Links Rd Skerries	None	None
	OBB51A	Skerries Footbridge	None	None
	OBB54	Ladies Stairs	None	None
	OBB55	County Bridge / Public Road	33, 33A, 33E, 33N, 33X	L85
	OBB57A	Balbriggan Footbridge	None	None
Zone D	OBB68	Irishtown/Public Road	None	None
	OBB74A	Laytown Footbridge	None	None
	OBB78	Colpe Bridge / Public Road	910, 912	910, 912
Zone E	OBB80/80A/80B	McGraths Lane Drogheda	None	None
	OBB81	MacBride Station	None	None
	OBB81C	MacBride Station	None	None
	UBK01	Dublin Road Bridge	D4, D5, 101, 101X	D4, D5, 101, 101X

The NTA's BusConnects plan is in the process of replacing the current Dublin Bus network. There are 16 core, high frequency arterial bus routes (spines) proposed for Dublin as part of this programme. There will also be a series of orbital, local, peak-only and express routes delivered within BusConnects. The BusConnects network redesign will enhance bus services with an increase in capacity and frequency. The future bus routes outlined in Table 6-10 will replace existing bus routes throughout the development area. As well as having established a new bus network for the Greater Dublin Area, the BusConnects programme also comprises the following elements:

- A new bus livery;
- A low-zero emissions bus fleet;
- A revised fare structure; and
- New bus stops and shelters.

6.4.5.2 Rail

6.4.5.2.1 Rail Stations and Services

The existing rail line within the extent of the Proposed Development comprises the Northern mainline from just north of Connolly Station in Dublin City Centre to Drogheda MacBride Station, in Co. Louth including the Howth Branch line which extends from Howth Junction and Donaghmede Station to Howth Station, in Dublin 13. Howth Station is the branch line terminus, whilst Drogheda MacBride Station, is located on the Northern mainline. There are 19 stations located along the length of the Proposed Development with connections to Dublin Bus or Bus Éireann services in the vicinity of most of the stations. This ensures that the Proposed Development enables patrons to make journeys to locations outside of the study area without the use of the private car.

Each of the stations along the line has been reviewed in terms of the facilities which they provide for passengers along with parking provision for both cars and cycles. The results of the review are set out in Table 6-13 below.

Table 6-13 Station Review Summary

Zone	Station	Bus stop	Bus Service	Facilities	Rail frequency (average workday)	Car Parking Provision	Cycle Parking Provision
A	Clontarf Road	Stop 4794 (circa. 20m) Stop 1735 (circa. 200m) Stop 1740 (circa. 250m) Stop 613 (circa. 400m) Stop 525 (circa. 450m)	6, 29N, 31N, 32X, 104, 130, H1, H2, H3, N4	Located minutes from the centre of Clontarf. Ticket vending machine & smart card enabled. Both platforms accessible via lifts and footbridges. Staffed: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030	192 Trains / day	105 car parking spaces	20 bicycle parking spaces
	Killester	Stop 531 (circa. 220m) Stop 607 (circa. 230m) Stop 530 (circa. 300m) Stop 608 (circa. 350)	6, 29N, 104, H1, H2, H3 N4,	Located in Killester. Ticket vending machine & smart card enabled. Both platforms accessible via ramps. Staffed: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030.	192 Trains / day	43 car parking spaces	3 bicycle parking spaces
	Harmonstown	Stop 624 (circa. 250m) Stop 645 (circa. 270m Stop 603 (circa. 450m) Stop 533 (circa. 470m)	6, 27A, H2, H3,	Located in Harmonstown village. Ticket vending machine & smart card enabled. Both platforms accessible via ramps. Staffed: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030.	192 Trains / day	No car parking spaces	No bicycle parking facilities
	Raheny	Stop 745 (circa. 30m) Stop 722 (circa. 50m) Stop 600 (circa. 200m) Stop 536 (circa. 240m)	29N, 31N, H1, H2, H3,	Located in Raheny village. Ticket vending machine & smart card enabled.	192 Trains / day	No car parking spaces	2 bicycle parking spaces

Zone	Station	Bus stop	Bus Service	Facilities	Rail frequency (average workday)	Car Parking Provision	Cycle Parking Provision
		Stop 535 (circa. 250m) Stop 599 (circa. 280m)		Access to platform 1 via lift or ramp. Access to platform 2 via ramp. Booking office: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030.			
	Kilbarrack	No bus stops in DART station surroundings		Located in Kilbarrack. Ticket vending machine & smart card enabled. Platforms accessible via ramps or steps. Staffed: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030.	192 Trains / day	No car parking spaces	No bike parking facilities
B	Howth Junction & Donaghmede	Stop 1012 (circa. 220m) Stop 7837 (circa. 250m) Stop 957 (circa. 250m) Stop 956 (circa. 290m) Stop 1010 (circa. 280m)	27A, N6	5 minutes from Donaghmede. Ticket vending machine & smart card enabled. Access to all platforms via lifts or stairs. Staffed: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030.	192 Trains / day	26 car parking spaces	Sheltered bicycle parking + 2 bicycle lockers available to rent
	Bayside	No bus stops in DART station surroundings		5-minute walk from Bayside. Ticket vending machine & smart card enabled. Access via stairs or lift to both platforms. Booking office: Mon. to Sat. 0545 - 0030. Sun. 0830 - 0030.	100 Trains / day	9 car parking spaces	10 cycle spaces
	Sutton	Stop 4381 (circa. 20m) Stop 954 (circa. 320m)	102, 102A, 102C, 102T	2-minute walk from Sutton Cross.	100 Trains / day	98 car parking spaces	Sheltered bicycle parking + 3

Zone	Station	Bus stop	Bus Service	Facilities	Rail frequency (average workday)	Car Parking Provision	Cycle Parking Provision
		Stop 935 (circa 350m) Stop 953 (circa. 480m)		Ticket vending machine & smart card enabled. Level access to Southbound platform. Ticket gate on road to Platform 2. Station Times: Mon. to Fri. 0545 - 0001. Sat. 0615 - 0021. Sun. 0830 - 0021.			bicycle lockers available to rent
	Howth	Stop 579 (circa. 25m) Stop 557 (circa. 80m) Stop 558 (circa. 250m) Stop 577 (circa. 290m) Stop 555 (circa. 350m) Stop 580 (circa. 370m)	6, H3	5-minute walk from Howth. Ticket vending machine & smart card enabled. Access from gate and ramp from roadway Staffed: Mon. to Sat. 0600 - 0030. Sun. 0830 - 0030.	100 Trains / day	14 car parking spaces	7 bicycle parking spaces
	Clongriffin	Stop 6138 (circa. 150m) Stop 6317 (circa. 170m) Stop 7245 (circa. 220m)	15	Ticket vending machine & smart card enabled. Lift and stairs to Northbound platform. Ramp to Southbound platform. Unmanned.	98 Trains / day	400 car parking spaces *Closed until further notice	No bicycle parking facilities
	Portmarnock	Stop 944 (circa. 550m)	32X, 102, 102C, 102T, H2	10-minute walk from Portmarnock. Ticket vending machine & smart card enabled. Full ramp access to both platforms. Unmanned.	98 Trains / day	274 car parking spaces	Sheltered bicycle parking + 4 bicycle lockers available to rent

Zone	Station	Bus stop	Bus Service	Facilities	Rail frequency (average workday)	Car Parking Provision	Cycle Parking Provision
	Malahide	Stop 3634 (circa. 120m) Stop 3585 (circa. 130m) Stop 4387 (circa. 280m) Stop 3584 (circa. 370m) Stop 3586 (circa. 380) Stop 3635 (circa. 420m)	32X, 42, 42D, 42N, 102, 102A, 102C, 102P,102T, 142, H2	Located at the centre of Malahide. Ticket vending machine & smart card enabled. Level access to Platform 1. Lift or footbridge to Platform 2. Staffed: Mon. to Sat. 0545 - 0000. Sun. 0830 - 0030.	148 Trains / day	83 car parking spaces	Sheltered bicycle parking + 7 bicycle lockers available to rent
C	Donabate	Stop 3720 (circa. 70m) Stop 3744 (circa, 80m) Stop 3730 (circa. 180m) Stop 7691 (circa. 200m) Stop 3743 (circa. 330)	33B, 33D, 33E, 33T, 534	Located at the centre of Donabate. Ticket vending machine & smart card enabled. Level Access from 0545 - 0030 Mon. to Fri. Staffed: Mon. to Fri. 0545 - 1430.	57 Trains / day	351 car parking spaces	Sheltered bicycle parking + 6 bicycle lockers available to rent
	Rush & Lusk	Stop 3849 (circa. 90m) Stop 3770 (circa. 100m) Stop 3768 (circa. 180m) Stop 3850 (circa. 200m) Stop 3769 (circa. 320m)	33, 33A, 33E, 33X, 533	Located between Rush & Lusk. Ticket vending machine & smart card enabled. Credit Card Facilities. Level access to Platform 1. Lift or footbridge to Platform 2. Unmanned.	57 Trains / day	432 car parking spaces	Sheltered bicycle parking + 7 bicycle lockers available to rent

Zone	Station	Bus stop	Bus Service	Facilities	Rail frequency (average workday)	Car Parking Provision	Cycle Parking Provision
	Skerries	Stop 6077 (circa. 200m) Stop 3567 (circa. 300m) Stop 3569 (circa. 400m)	33, 33A, 33E, 33N, 33X	10-minute walk from Skerries town. Ticket vending machine & smart card enabled. Level access to Platform 1. Lift or footbridge to Platform 2. Staffed: Mon. to Fri. 0545 - 1400.	61 Trains / day	125 car parking spaces	Sheltered bicycle parking + 8 bicycle lockers available to rent
	Balbriggan	Stop 134741 (circa. 20m) Stop 134742 (circa. 20m) Stop 100711 (circa. 290m) Stop 100291 (circa. 310m)	101, 101X, 191, 192, 195, B1,	Located at the centre of Balbriggan. Ticket vending machine & smart card enabled. Lift & footbridge to Platform 1. Level access to Platform 2. Booking office: Mon. to Fri. 0545 - 2000. Sat. 0700 - 2000. Sun. 0830 - 0030.	60 Trains / day	98 car parking spaces	Sheltered bicycle parking + 9 bicycle lockers available to rent
D	Gormanston	Stop 100701 (circa. 410m)	101, 101X	Adjacent to beach. Ticket vending machine & credit card facilities. Level access to Platform 1. Steps or footbridge to Platform 2. Unmanned.	47 Trains / day	116 car parking spaces	Sheltered bicycle parking available
	Laytown	Stop 109331 (circa. 150m) Stop 108711 (circa. 170m)	910, 912, D1, D2	Located in Laytown village. Ticket vending machine & credit card facilities.	56 Trains / day	24 car parking spaces	Sheltered bicycle parking available

Zone	Station	Bus stop	Bus Service	Facilities	Rail frequency (average workday)	Car Parking Provision	Cycle Parking Provision
				Footbridge & Lift to Platform 1. Ramp from roadway to Platform 2. Unmanned			
E	Drogheda MacBride	Stop 137181 (circa. 180m) Stop 100381 (circa. 220m) Stop 103501 (circa. 250m) Stop 136881 (circa. 420m)	101, 101X, D4, D5,	15-minute walk from town centre Ticket vending machine, smart card enabled & credit card facilities. Coffee Cart & Toilets Level access to Platform 1, lift to Platform 2. Booking office: Mon. to Thurs. 0545 - 1800. Fri. 0545 - 1230. Sat. 0700 - 1300. Sun. closed.	71 Trains / day	300 car parking spaces	Sheltered bicycle parking + 9 bicycle lockers available to rent

6.4.5.2.2 Daily Passenger Boardings at Train Stations

Table 6-14 below outlines the daily boardings for the train stations within all five zones within the development from the National Rail Census Report, 2022. Overall rail boardings have yet to reach the pre-Covid levels of 2019.

Table 6-14 Daily Passenger Boardings at each Station

Zone	Station	2019 Passenger Number	2022 Passenger Numbers
Zone A	Clontarf Road	2172	1415
	Killester	2665	2211
	Harmonstown	1406	1023
	Raheny	2207	1614
	Kilbarrack	1663	1335
Zone B	Howth Junction & Donaghmede	1727	1460
	Bayside	1329	781
	Sutton	931	911
	Howth	1379	1250
	Clongriffin	1640	1341
	Portmarnock	2121	1315
	Malahide	3456	3309
Zone C	Donabate	1663	1178
	Rush & Lusk	1176	976
	Skerries	1628	1329
	Balbriggan	2180	2118
Zone D	Gormanston	87	86
	Laytown	490	499
Zone E	Drogheda MacBride	1047	1178

6.4.5.2.3 Level Crossing Closures

The Howth Branch line operates from Howth Junction and Donaghmede to Howth. Three trains per hour travel in each direction along this line equalling a maximum of six trains in total, per hour.

Iarnród Éireann (IÉ) has provided the working timetable (WTT) currently used for the daily operation. A timetable for 3TPH per hour per direction, based on the WTT, was modelled in RailSys. The RailSys model was calibrated using level crossing closure data from across the day and validated between the hours of 0730 and 1030. The output of the RailSys model has been used to calculate the closure timings and represents the baseline vehicular impact scenario for comparison purposes.

Baldoyle Road (Kilbarrack) and Sutton Level Crossings are the two that have the highest volumes of vehicles crossing them and have the greatest potential to cause delays on the wider network if queues form at the level crossings. As a result, these have been analysed using modelling software and quantitative methods.

Cosh and Claremont Level Crossings have a much lower level of vehicle traffic crossing them as they are mainly only used for local access, so they don't run the risk of causing long queues. For these, qualitative analysis methods have been applied.

From the analysis of Kilbarrack and Sutton Leve Crossings, see Table 6-15 and Table 6-16, the baseline closure times are approximately 15~16 minutes every hour in the AM and PM peaks for both level crossings.

Table 6-15 AM Railway Stats for the Level Crossings – 08:00 – 09:00

Level Crossing	No. Closures	Total Closure Time	Minimum baseline closure time	Maximum baseline closure time
Baldoyle Road (Kilbarrack) Level Crossing	4	00:15:20	00:02:25	00:05:17
Sutton Level Crossing	3	00:14:54	00:04:06	00:05:52

Table 6-16 PM Railway Stats for the Level Crossings – 17:30 – 18:30

Level Crossing	No. Closures	Total Closure Time	Minimum baseline closure time	Maximum baseline closure time
Baldoyle Road (Kilbarrack) Level Crossing	3	00:12:56	00:04:05	00:04:20
Sutton Level Crossing	4	00:16:32	00:02:40	00:05:38

6.4.5.3 Park and Ride

There are 19 stations included within the DART+ Coastal North development, with 15 providing car parking facilities for commuters. The extent of both bicycle and car parking facilities vary across each train station, with some offering more than 300 car parking spaces. Contrastingly, a number of train stations offer little or no capacity for cars or bicycles. The four train stations that offer no car parking facilities are Harmonstown, Raheny, Kilbarrack, and Howth Junction & Donaghmede Stations.

A number of these stations are located within highly populated residential areas, where walking can serve as the last mile transport solution. The majority of parking facilities associated with Zones C, D and E have sufficient capacity for the needs of commuters. Generally, in areas with greater residential density, the designated train station car parks have a greater occupancy.

A study was conducted in the first quarter of 2020 to determine the occupancy rates of certain train station car parking facilities across the country. 12 car parks associated with the DART+ Coastal North project were considered in this study. The occupancy rates for the car parks varied between 9% and 99% in January 2020. Gormanston, recorded an average of 10 occupied parking spaces from the total 116. Clontarf Road station had the highest recorded occupancy rate with an average of 104 of the total 105 parking spaces being used.

6.4.6 Personal Injury Accident Data Review

This section provides a review of accident data obtained from the Road Safety Authority (RSA) website. The data provided on the RSA website is only available for the period between 2005 and 2016. Table 6-17 below sets out the number of accidents at each of the level crossings within the Proposed Development or in the immediate vicinity (within 50 meters) by classification of their severity, i.e., minor, serious, and fatal. Most of the accidents were minor, and there were no fatal accidents at any of the level crossings between 2005 and 2016.

Table 6-17 Road Accidents at Level Crossings

Zone	Level/Bridge Crossing	Accident Severity			Total (2005 to 2016)
		Minor	Serious	Fatal	
B	Baldoyle Road (Kilbarrack) Level Crossing (XQ001)	1			1
B	Sutton Level Crossing (XQ002)	3			3

From the data available for the level crossings and their immediate vicinity, no highway safety issues were identified at these locations.

6.5 Description of Potential Impacts

6.5.1 Potential Construction Impacts

The construction of the Proposed Development is envisaged to take place over approximately 36 months (inclusive of advanced utility diversion contracts and long lead item procurement). The construction programme has been developed considering how efficiently the works may be undertaken and to reduce the potential for environmental impacts.

6.5.1.1 Construction Programme

The high-level indicative construction programme is set out in Image 6-29 below identifying the key construction phases and likely construction years. It is noted that the period allowed for testing and commissioning also includes sufficient time for decommissioning of redundant assets, other than those decommissioned at the start of the project.

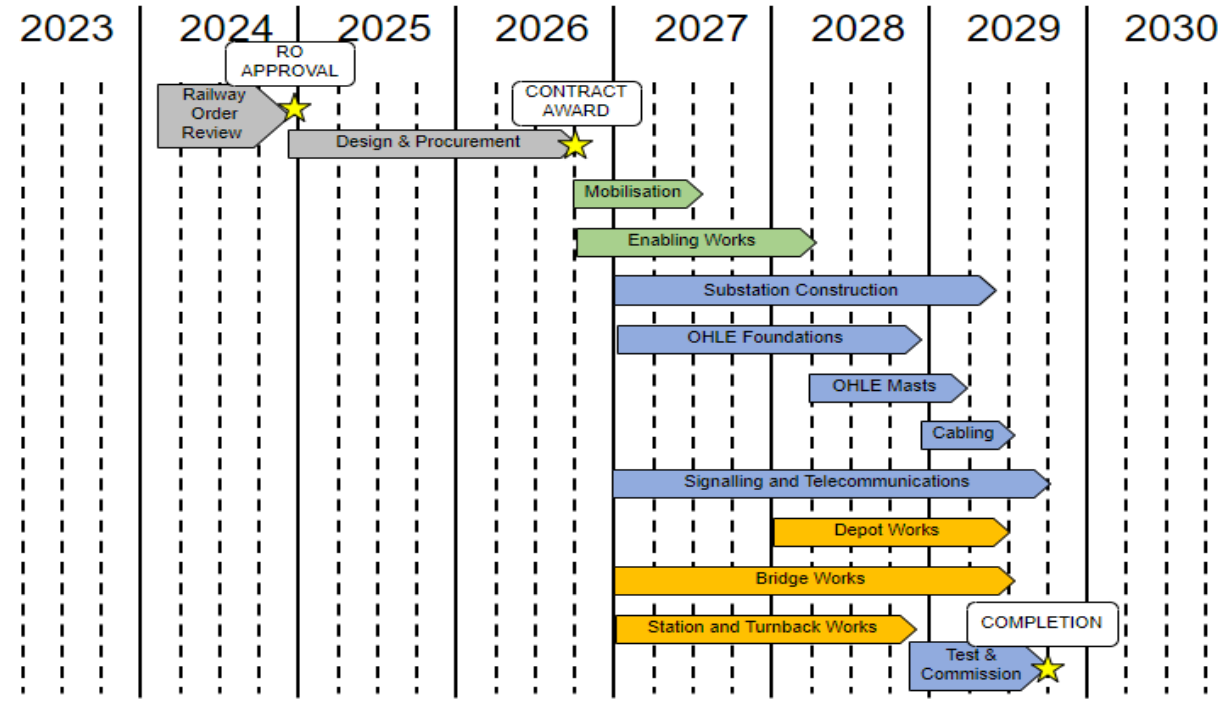


Image 6-29 High-Level Construction Programme

Using the indicative construction programme, the construction works to take place in each zone have been identified. To accommodate the upgrade to the rail line, a number of proposed works are required along the length of the line which could impact upon pedestrians, cyclists, public transport users, and vehicles during the construction period.

6.5.1.2 Construction Compounds

To enable the Proposed Development to be constructed, compounds and work areas would be required along the length of the line. The Construction Compounds comprise line wide compounds and isolated works compounds. Isolated Construction Compounds are generally located adjacent to the site of individual elements of infrastructure constructed, for example, at the depot or where major bridge or station works are required. Line wide Construction Compounds are located at various locations along the development route. Some of the Construction Compounds serve both individual interventions and line wide works.

Construction Compounds will only be in place during the Construction Phase of the Proposed Development and only whilst the work for which they are being used is being undertaken, and therefore not necessarily for the full duration of the construction works. The location of the proposed Construction Compounds is set out in Table 6-18.

Table 6-18 Construction Compounds

Code	Zone	Location	Primary Discipline	Chainage	Within IE property?
CC-2650	A	Fairview Depot South (R834 Entrance car park)	Station	2,650	Yes
CC-2700	A	Fairview Depot Centre (R834 Entrance car park)	Station	2,700	Yes
CC-3000	A	Fairview Depot North (R807 Entrance car park)	Station	3,000	Yes
CC-9000	B	Howth Junction and Donaghmede Station (Donaghmede Entrance)	Station	9,000	No
CC-9050	B	Howth Junction and Donaghmede Station (Kilbarrack Entrance)	Station	9,050	No
CC-9100	B	Howth Junction and Donaghmede Station (Central Access)	Station	9,100	Yes
CC-9200	B	Howth Junction and Donaghmede Station (Baldoyle Industrial Estate)	Station	9,200	No
CC-10600	B	Clongriffin Station	Permanent Way	10,600	No
CC-15900E	B	Malahide Turnback (Strand Court)	Permanent Way	15,900	No
CC-15900W	B	Malahide Turnback (Bissets Strand)	Permanent Way	15,900	No
CC-16100	B	Malahide Turnback (Caves Strand)	Permanent Way	16,100	No
CC-16250	B	Malahide Turnback (Marina Car Park)	Permanent Way	16,250	No
CC-16400	B	UBB30 Malahide Viaduct	Structures	16,400	No
CC-18800	C	Donabate Substation	Substation & SET line-wide works	18,800	No
CC-19800	C	Donabate Station	SET line-wide works	19,800	Yes
CC-23500	C	Rush and Lusk Substation	Substation & SET line-wide works	23,500	No
CC-23772 (E)	C	Rush & Lusk	Utility Diversions	23,772	No
CC-23772 (W)	C	Rush & Lusk	Utility Diversions	23,772	No

Code	Zone	Location	Primary Discipline	Chainage	Within IE property?
CC-25626 (E)	C	Tyrrelstown	Utility Diversions	25,626	No
CC-25626 (W)	C	Tyrrelstown	Utility Diversions	25,626	No
CC-27460 (E)	C	Baldongan	Utility Diversions	27,460	No
CC-27460 (W)	C	Baldongan	Utility Diversions	27,460	No
CC-29000	C	Skerries South Substation	Substation	29,000	No
CC-29140 (E)	C	Golf Links Road	Utility Diversions	29,140	No
CC-29140 (W)	C	Golf Links Road	Utility Diversions	29,140	No
CC-30200	C	Skerries Station	Permanent Way & SET line-wide works	30,200	Yes
CC-31100	C	Skerries	SET local works	31,100	No
CC-32200	C	Skerries North Substation	Substation	32,200	No
CC-34400 (E)	C	Balbriggan	Utility Diversions	34,400	No
CC-34400 (W)	C	Balbriggan	Utility Diversions	34,400	No
CC-36000	C	UBB56 Balbriggan Viaduct	Structures	36,000	No
CC-37700	C	Balbriggan Substation	Substation & SET line-wide works	37,700	No
CC-39720 (E)	D	Gormanston Station	Utility Diversions	39720	No
CC-39720 (W)	D	Gormanston Station	Utility Diversions	39720	No
CC-40200	D	Gormanston Station	Permanent Way & SET line-wide works	40,200	No
CC-41400	D	Gormanston Substation	Substation	41,400	No
CC-44320 (E)	D	Laytown	Utility Diversions	44,320	No
CC-44320 (W)	D	Laytown	Utility Diversions	44,320	No
CC-44500	D	UBB72 Laytown Viaduct (South Abutment)	Structures	44,500	No

Code	Zone	Location	Primary Discipline	Chainage	Within IE property?
CC-44600	D	UBB72 Laytown Viaduct (South Pier)	Structures	44,600	No
CC-44700	D	UBB72 Laytown Viaduct (North Pier)	Structures	44,700	No
CC-44900	D	Laytown Station	SET line-wide works	44,900	No
CC-44920 (E)	D	Laytown	Utility Diversions	44,920	No
CC-46900	D	Bettystown Substation	Substation	46,900	No
CC-49600	D	OBB78 Track Lowering	Permanent Way	49,600	No
CC-50270 (S)	D	Drogheda	Utility Diversions	50,270	No
CC-50270 (N)	D	Drogheda	Utility Diversions	50,270	No
CC-51700 (S)	D	Drogheda	Utility Diversions	51,700	No
CC-51800	E	OBB80 (North)	Structures & SET line-wide works	51,800	No
CC-51900	E	OBB80 (South)	Structures	51,900	Yes
CC-52050	E	Drogheda Substation	Substation	52,050	No
CC-52250	E	Drogheda Station	Station	52,250	Yes
CC-52200	E	UBK01 Dublin Road Overbridge (Car Park)	Structures	52,200	Yes

6.5.1.3 Construction Routing

To limit the impact of the construction of the Proposed Development on the road networks and sustainable transport networks, routing to compounds primarily, construction vehicles will make use of the national and regional road networks with limited use of any residential roads unless there is an absolute requirement to do so.

6.5.1.3.1 Zone A

Fairview Depot Modifications

Areas for Construction Compounds have been identified within the Fairview depot, these will be accessed via the existing depot accesses off the R807 and R834, as shown in Image 6-30.

Image 6-30 Fairview Depot Construction Compounds and Access Routing

6.5.1.3.2 Zone B

Howth Junction and Donaghmede Station works

The nearest road link of strategic importance to these works is the R139 which joins the M1 in the west via the R139. The proposed Construction Compound would be accessed from the R139 via the Baldoyle Industrial Estate, see Image 6-31.

Image 6-31 Howth Junction Proposed Construction Compounds and Access Routes

Clongriffin Station Works

The nearest road link of strategic importance to the proposed Construction Compound is the R123 ("Moyne Road") to the north which joins onto the M1 to the west via the R107 and R139. It currently provides access for a new road leading to the ongoing housing construction adjacent to the station. It is proposed that this road will be shared between the appointed contractors for the Proposed Development and the housing developers. The Construction Traffic Management Plan (CTMP) provided in the Construction Environmental Management Plan (CEMP) in Appendix A5.1 in Volume 4 of this EIAR details the proposals for traffic management and will be further developed by the Contractor prior to construction, in liaison and with the agreement of the local authority.

Construction traffic will be restricted to the regional road network (R-routes) as far as possible. These routes are designed with the functionality of accommodating mobility needs of HGVs in mind. Options to travel along Station Road or Red Arches Road (local roads) are therefore not recommended. General construction access should be along the R123, R106 and R809. Details for appropriate traffic management will be further developed by the Contractor prior to construction. The safe crossing of the Portmarnock Greenway and the safety of the Moyne Park community during construction will be detailed in the Contractor's CTMP.

Underbridge UBB20, where the R123 crosses under the railway, has a clearance of 3.85m. This will restrict larger construction vehicles; in which case such vehicles would access the site via the R106 Coast Road to the east.

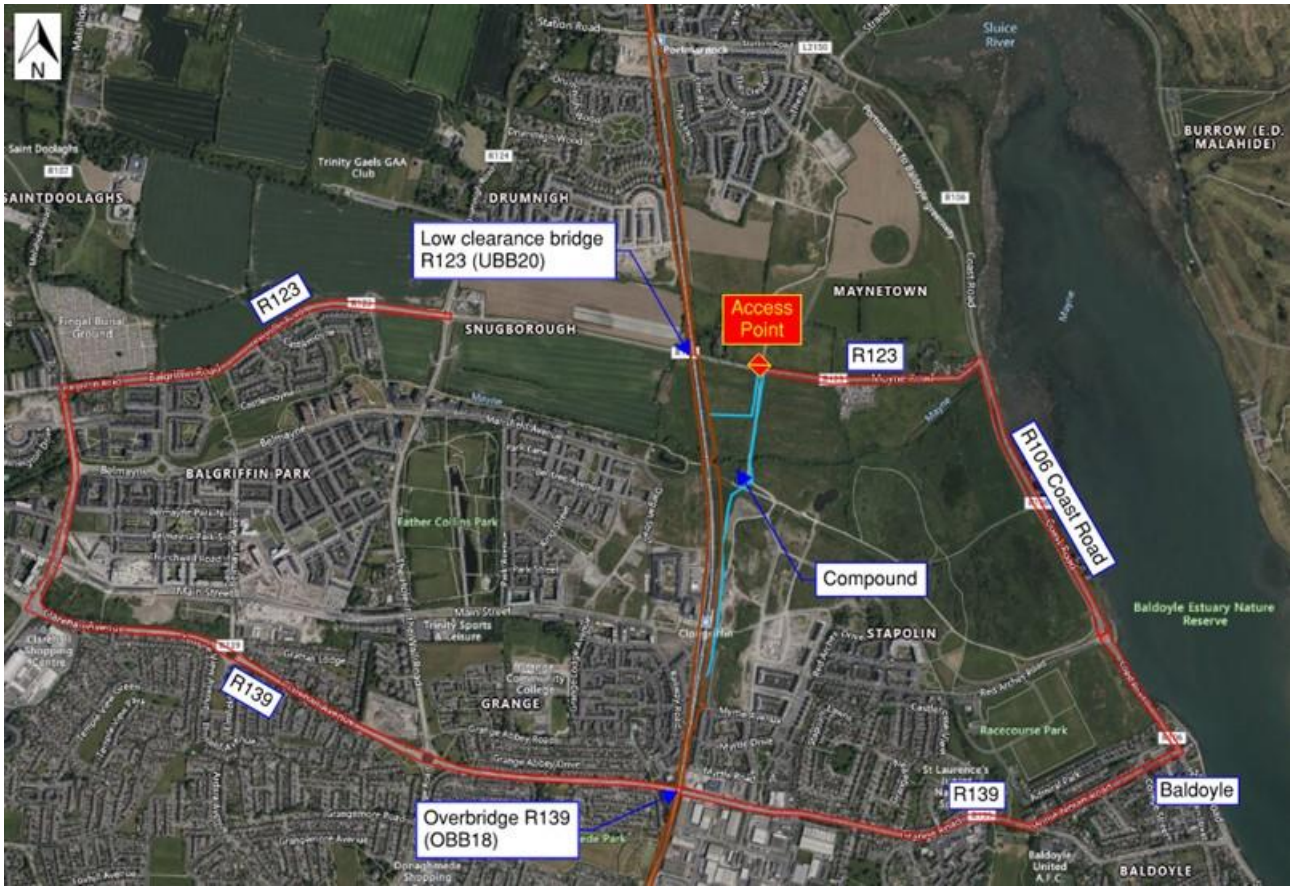


Image 6-32 Clongriffin Construction Compound proposed Construction Access Route

Malahide Turnback and UBB30 Viaduct Works

Construction access by water has been ruled out due primarily to insufficient water depth, poor mooring opportunities for construction marine vessels and level differences.

The nearest road link of regional importance is the R106 Swords Road / Dublin Road / Main Street which joins the M1 to the west via the R132 and R125 at Junction 3. This road provides the best form of access to the site, through the village of Malahide, leading to the Malahide Wastewater Treatment Access Road. A low-clearance underbridge (UBB29) on Bissett's Strand (2.2m headroom) segregates access between the Construction Compounds on the east and west of the railway. Therefore, access to the Construction Compounds on the west of the railway will be accessed from the R106 via the L2130 and L2133 to the proposed site access point on Bissett's Strand.

Options from the R106 to/from the two Construction Compounds on the east of the railway were considered. New Street has Part 8 planning permission for pedestrianisation and is therefore not an option. Townyard Lane (northbound only) is very narrow with a lot of activity around the shop / restaurant area at the northern end. Old Street (northbound only) is relatively wider with on-street paid parking adjacent and is currently accommodating buses and heavy vehicles accessing a treatment plant in the Marina. James' Terrace (southbound only) is relatively wide with on-street paid parking, a bus stop and taxi lay-bye adjacent. It is therefore recommended that the main construction access route will be via Old Street (northbound) and James' Terrace (southbound).

General construction access along the public road will take place between 10 am and 4pm avoiding peak hours and nighttime.

A high level swept path analysis based on aerial photography and OS mapping was carried out along the proposed access routes. It was found that a standard construction vehicle (12m rigid truck) can be accommodated within the current available road cross-section. Larger vehicles, such as a 16.5m articulated truck would require additional traffic management, such as the removal of on-street parking in certain locations in order to be accommodated, especially if being used regularly throughout construction. It is therefore recommended that construction vehicles be restricted to 12m rigid trucks and that larger vehicles follow the permitting requirements for abnormal loads. In the case of abnormal loads, the most appropriate access route will be determined by the contractor for the specific load and the specific vehicle type. The appropriate route for abnormal loads may be James' Terrace, in which case it may temporarily be required to be changed to accommodate two-way traffic, in order to accommodate an occasional articulated truck or abnormal load.

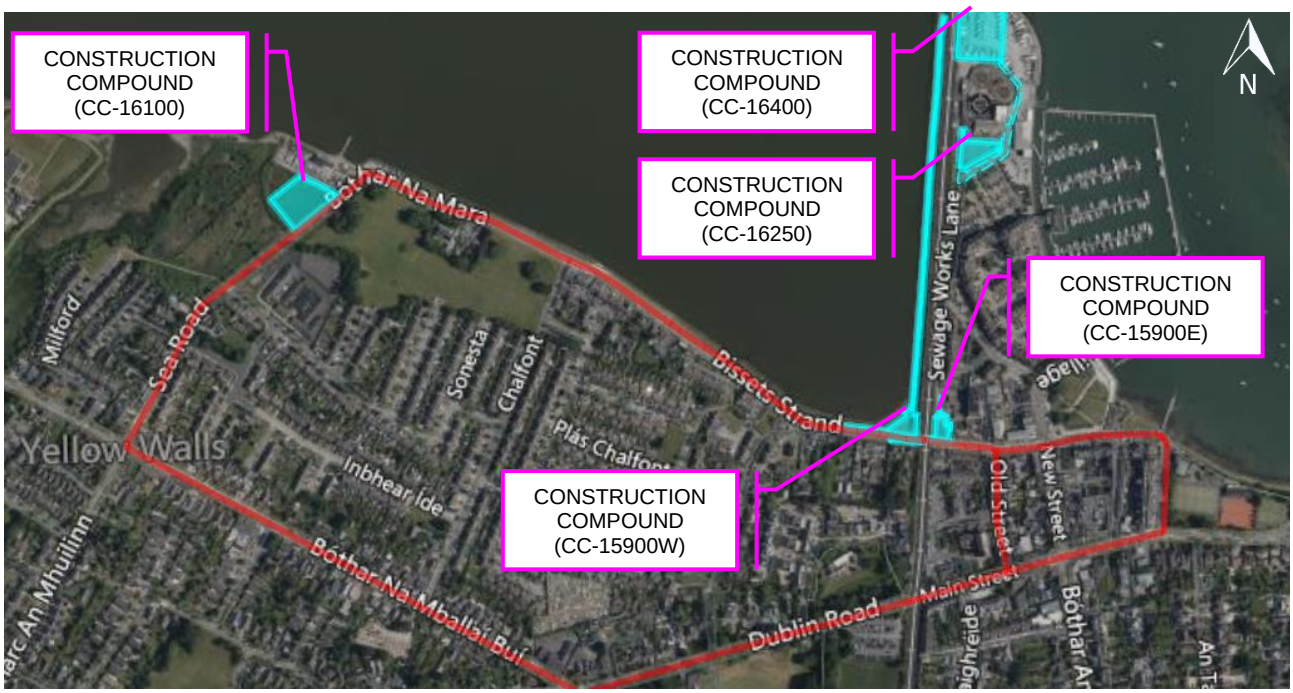


Image 6-33 Malahide Proposed Construction Compound and Access Routes

Image 6-34 Malahide Turnback – Proposed Construction Access Route (Source: ESRI)

6.5.1.3.3 Zone C

Donabate Substation

The nearest road link of strategic importance in this area is the R126 which links with the M1 to the west. Local site access will be a via a new access road off the L6165, this will also form the permanent access to the substation.

Image 6-35 Donabate Substation proposed Construction Compound and Access Route

Rush and Lusk Substation and OHLE Maintenance Compound

The nearest road link of strategic importance in this area is the R127 which links Skerries, Balbriggan and Lusk with the M1. Local site access will be off the R128 (Station Road). The existing access into the station car park requires a sharp right turn, it is planned that this is realigned as part of the permanent works. Once undertaken it will enable improved access for both public and contractors' vehicles.

Image 6-36 Rush and Lusk Substation Construction Compound and Access Route

OBB39 Station Road/R128 track lowering works

Given the proximity of the Road Rail Access Point (RRAP) and proposed line-wide construction compound at Rush and Lusk station a separate Construction Compound to support the track lowering work is not required.

OBB44 Tyrellstown Bridge track lowering works

The proposed Construction Compound for these track lowering works is located to the West of OBB44 in agricultural land outside the IÉ land boundary. The nearest road of strategic importance is the R127 which joins the M1 via the R132 to the south-west. It is noted that Horestown Road and the adjoining lanes that would be used to reach the R127 are narrow and may constrain access to larger construction vehicles.

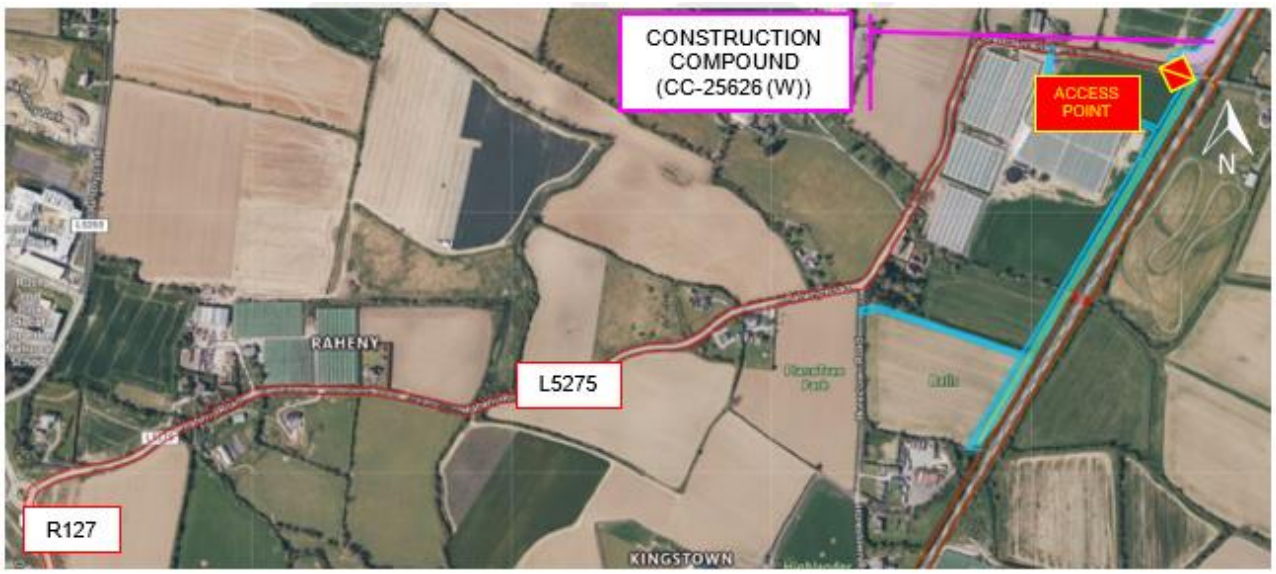


Image 6-37 Proposed access to OBB44 track lowering works Construction Compound

Skerries South Substation

A new access road will be created off the east embankment of the existing overbridge which will serve as the substation access in the permanent case as well. Prior to construction of the new permanent access road, temporary access to the site would initially be via the farm access to the field to the east as shown in Image 6-38.

The nearest road link of strategic importance in this area is the R127 which links Skerries, Balbriggan and Lusk with the M1. Local site access will be off the R127 via Golf Links Road avoiding the town and low clearance bridge to the east.

Image 6-38 Skerries South Substation Construction Compound and Access Route

Skerries Track Paralleling Hut

The extent of the Construction Compound is shown in Image 6-39, with traffic management required for a portion of the Barnageeragh road to enable access during the civil works and equipment installation phases.

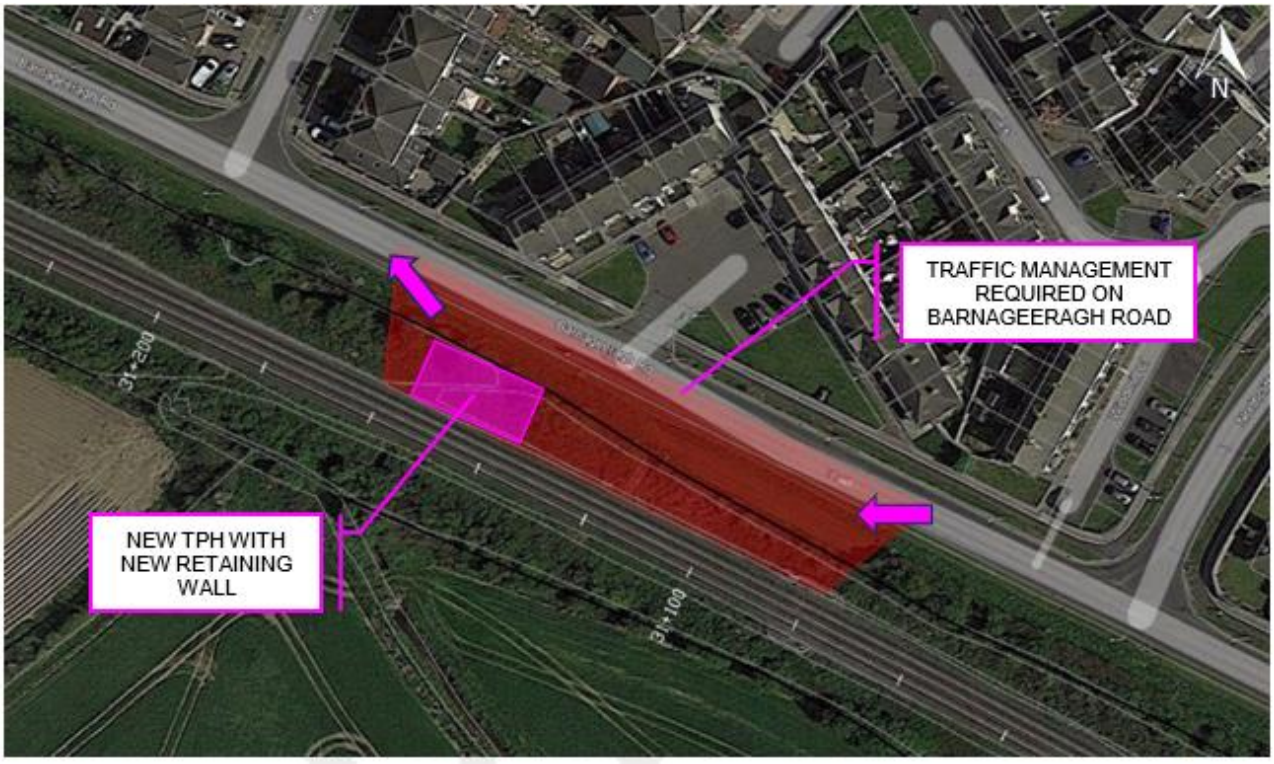


Image 6-39 Skerries Track Paralleling Hut Construction Compound and Access Route

Skerries North Substation

The nearest road link of strategic importance in this area is the R127 which links Skerries, Balbriggan and Lusk with the M1. However, at its nearest point to the site the R127 can only be accessed by passing under a nearby railway underbridge with a low clearance of 3.12m. Therefore, larger vehicles will have to access the Skerries North site via an alternative route to the South via the L1270. Local site access will be via a new section of road off the Barnageeragh Road / L1270, which will also serve as the substation access in the permanent case.

Image 6-40 Skerries North Substation Construction Compound and Access Route

UBB56 Balbriggan Viaduct Modification

Access to the Construction Compound from the M1 would be via the R122. Local access in Balbriggan would follow the one-way system along Quay Street and Mill Street. It is noted that the proposed redevelopment of the car park may alter the existing one-way system.

During construction it will be necessary to close Harbour Road at night on several occasions to site the crane there for the lifts of the individual footway sections. Traffic would need to be diverted west, further into the centre of Balbriggan. There are many one-way roads near Balbriggan Viaduct, so diverting a steady flow of traffic may be difficult outside of night-time possessions. Traffic management may be required for several of the one-way roads fed by Harbour Road to maintain access during the road closure.

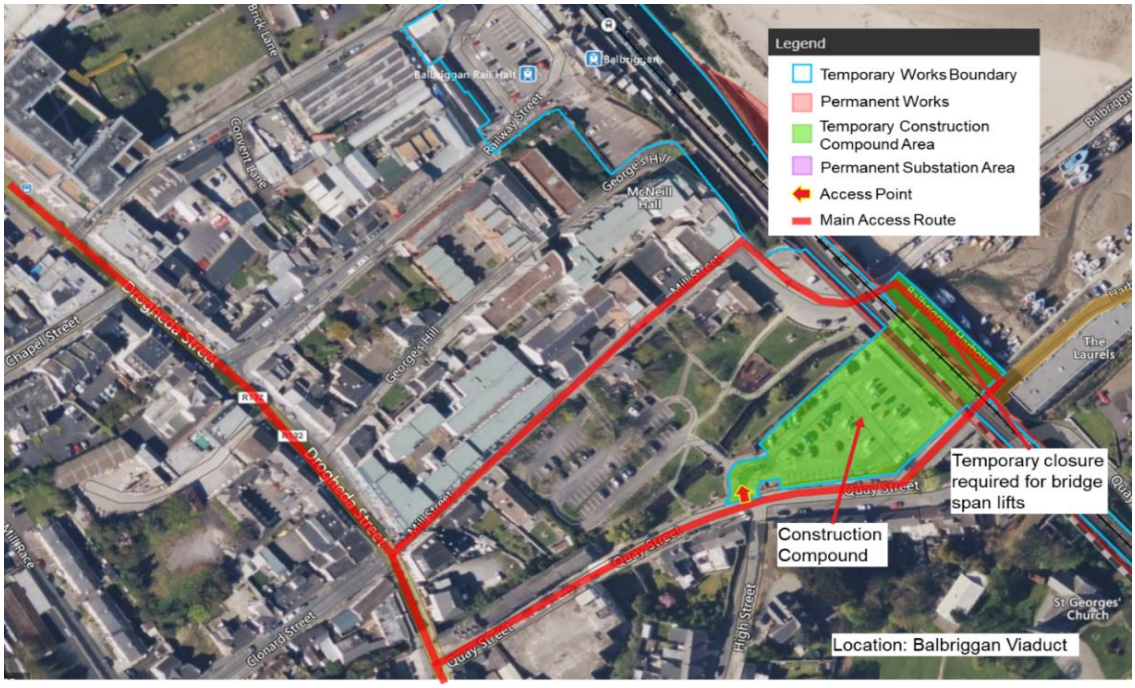


Image 6-41 UBB56 Balbriggan Viaduct Construction Compound and Access Route

Balbriggan Substation

The nearest road link of strategic importance in this area is the R132 which connects with the M1 in the north, avoiding routing through Balbriggan. This road is suitable to serve construction traffic. Site access will be via a new section of road off the R132, which will also serve as substation access in the permanent case.

Image 6-42 Balbriggan Substation Construction Compound and Access Route

Line-wide Construction Compounds

There are some line-wide compounds required within this zone, which will be located at, or adjacent to, existing IÉ maintenance compounds. In Zone C these are at Donabate and Skerries Stations, in addition to those already mentioned at Donabate Substation, Rush and Lusk Substation and Balbriggan Substation. The location and access routes for the Donabate and Skerries Station line-wide compound locations are identified in the following images.

Image 6-43 Donabate Station Line-wide Construction Compound and Access Route

Image 6-44 Skerries Station Line-wide Construction Compound and Access Route

6.5.1.3.4 Zone D

Gormanston Substation

The nearest road link of strategic importance in this area is the R132 which connects with the M1 in the south-west. This road is suitable to serve construction traffic. Site access will be via the new section of road off Irishtown, which will serve as substation access in the permanent case.

Image 6-45 Access to Gormanston Substation Construction Compound

UBB72 Laytown Viaduct Works

The site here is accessible from the regional road (R150) from the north or via Coastview Cottages, a local road from the south. The regional road is approximately 6m wide and the local road is narrow at approximately 3m width. The regional road to the north connects Julianstown and Laytown villages. The nearest road link of regional importance is the R132 Dublin Road that connects with the M1 in the south-west.

Construction access will be required at both the north and south of the viaduct. The southern local access road is narrow and would require additional traffic management measures to accommodate two-way construction traffic volumes. The clearance under the viaduct on this road is 4.26m. Where possible rail would be used as a means for delivering large construction materials such as the steel beams, subject to agreement between IE and the contractor.

Image 6-46 Access for vehicles to UBB72 Construction Compounds

Bettystown Substation

The nearest road link of strategic importance in this area is the R150 which connects with the M1 in the south via Colpe Road and the R132. Site access, will be via a new section of road which would need to be constructed off Narroways Road (L5362) as shown in Image 6-47.

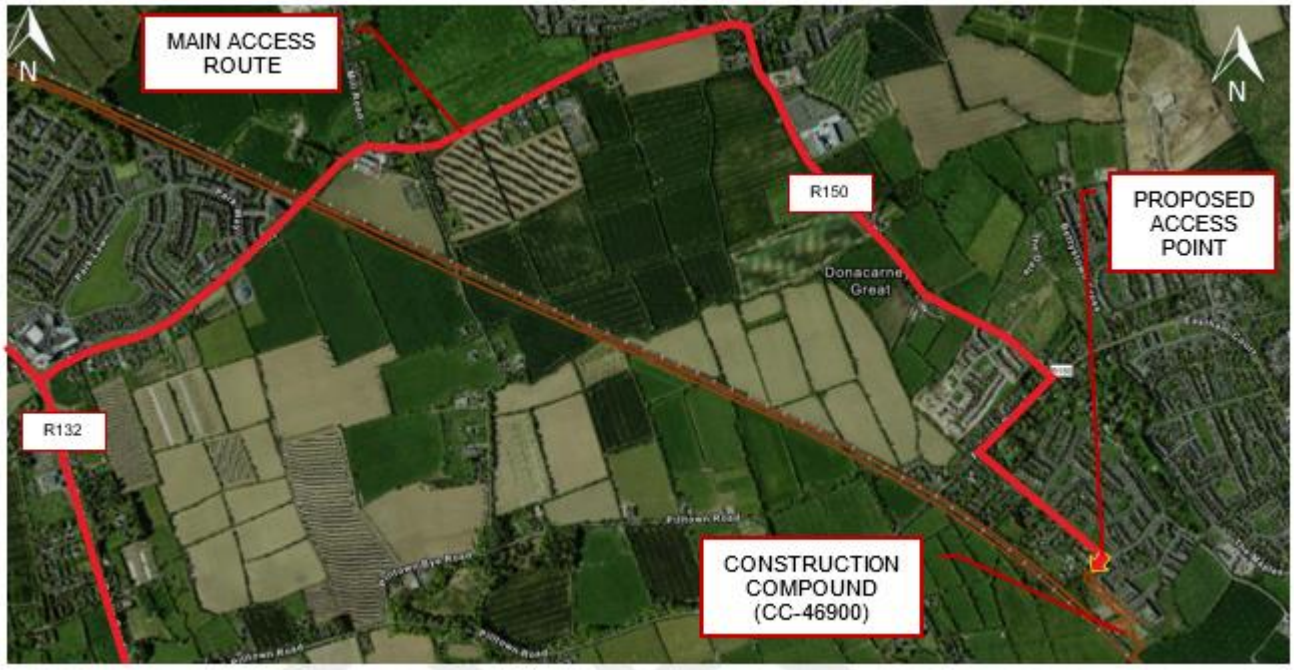


Image 6-47 Bettystown Substation Construction Compound and Access Route

OBB78 Colpe Road Bridge track lowering works

The nearest road of strategic importance is the R132 which joins the M1 to the south-west near Gormanston. The Colpe Road joins the R132 at the small roundabout to the East. The proposed Construction Compound is located to the south-west of OB78 in agricultural land outside the IÉ land boundary. The bridge is surrounded by suitable fields, but the option shown is deemed to minimise the impact to residents to the north of the bridge.

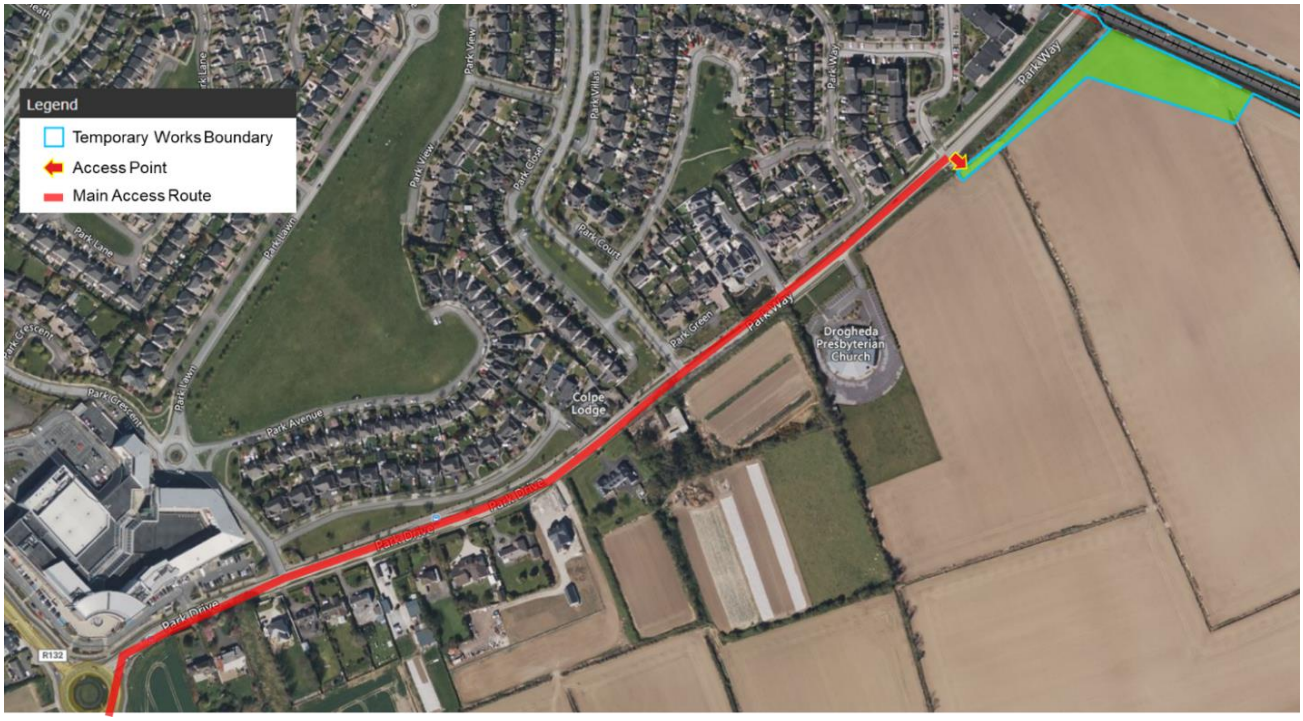


Image 6-48 Access to OBB78 track lowering works Construction Compound

Line-wide Construction Compounds

There are some line-wide compounds located at existing maintenance compounds rather than at isolated works Construction Compounds. In Zone D these are at Gormanston Station (CC-41400) and Laytown Station (CC-44900). Their location and access routes are identified in the following images.

Image 6-49 Gormanston Station Line-wide Construction Compound and Access Route

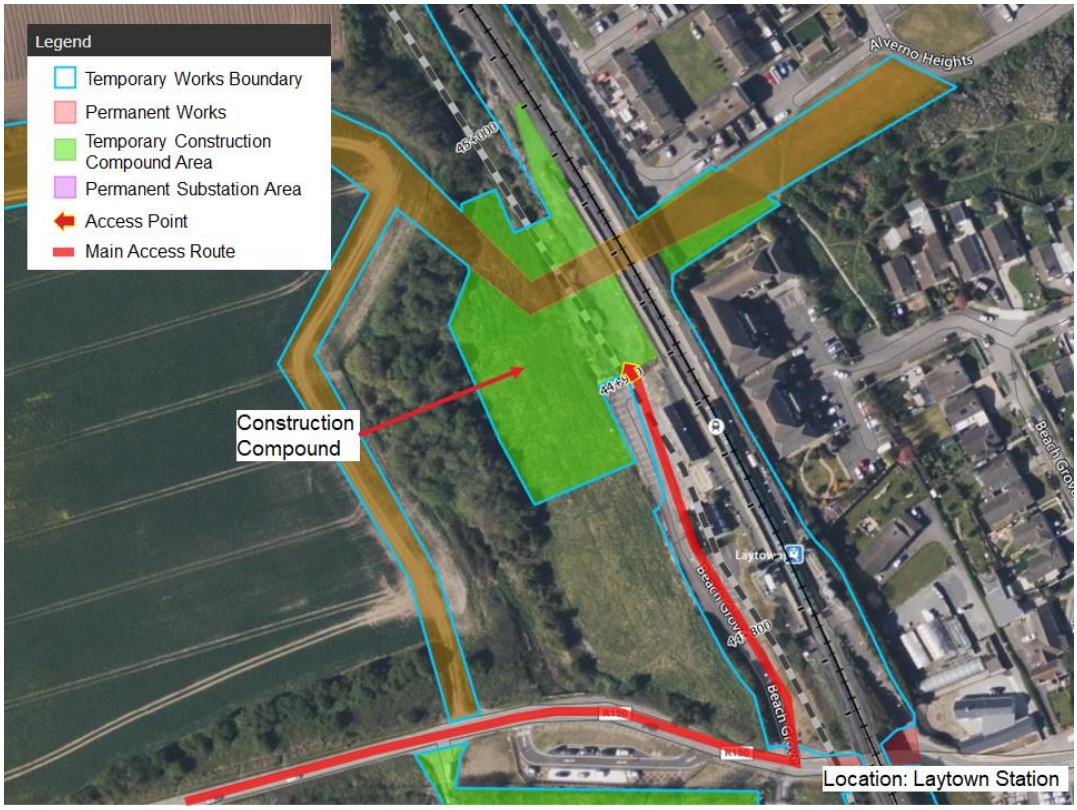


Image 6-50 Laytown Station Line-wide Construction Compound and Access Route

6.5.1.3.5 Zone E

OBB80/80A/80B Railway Terrace/McGraths Lane Bridge

The nearest road link of strategic importance to the McGraths Lane Bridge is the R150 which connects with the M1 in the south via Colpe Road and the R132. Access to the main compound is planned to be via a new temporary road, just westward of a road recently built for a new housing development in the area. Although limited, some construction access is also likely to be required along Railway Terrace, part of this in conjunction with the installation of a signal equipment building (SEB) near the bridge. Construction traffic would approach Railway Terrace via the R132 to the south to avoid traffic routing through the centre of Drogheda.

Access to the two residential properties on the north side of McGrath's Lane and to the rear station depot entrance will be maintained during the replacement of the bridge via a new road link to Marsh Road (R150).

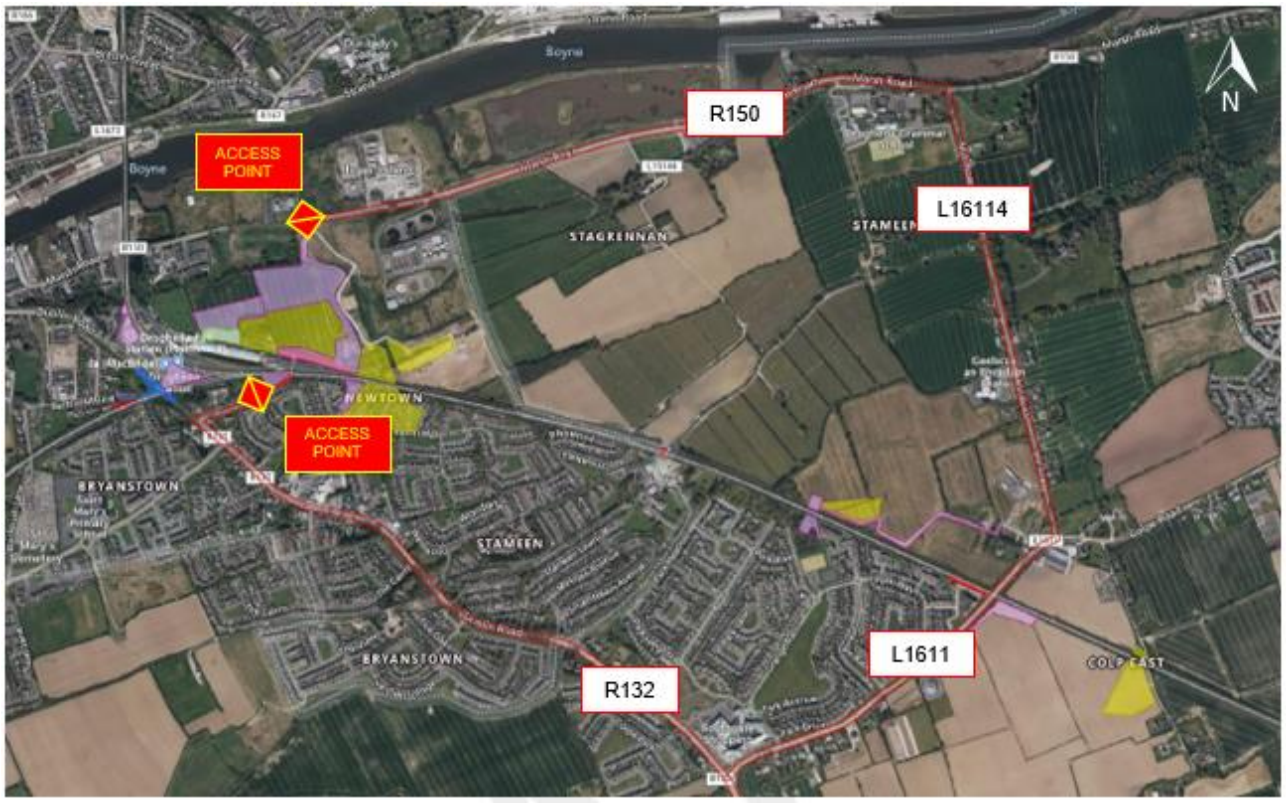


Image 6-51 Main access route to OBB80/80A/80B McGraths Lane Bridge Construction Compounds

UBK01 Dublin Road Bridge/OBB81 Drogheda Station Footbridge/Platform 4, Navan Line

The nearest road link of strategic importance in this area is the R132 which connects with the M1 in the south, avoiding routing construction traffic through the centre of Drogheda. Clearance under UBK01 is 4.78m and hence any traffic needing greater clearance would need to access the site from the M1 in the west via Donore Road and the R132.

The R132 Dublin Road will need to be reduced to a single lane, with bi-directional flow operating under traffic lights throughout much of the works, anticipated to be over several months. At times, such as during demolition, the road will need to be closed completely, during which a traffic diversion will be in place. These periods are likely to be for only a few days at a time, limited to weekends. where traffic flow is maintained, provision will be made for safe pedestrian footways.

Image 6-52 UBK01/OBB81/Platform 4 Construction Compound and Access Routes

Drogheda Substation

Contractors will predominantly use an access route through the west end of the station car park for construction access, Image 6-53, through the constrained tunnel under the railway and then along the north side of the depot building. An alternative route could be from the east, Image 6-54, via McGrath's Lane, though this may not be possible during OBB80 McGrath Lane bridge works.

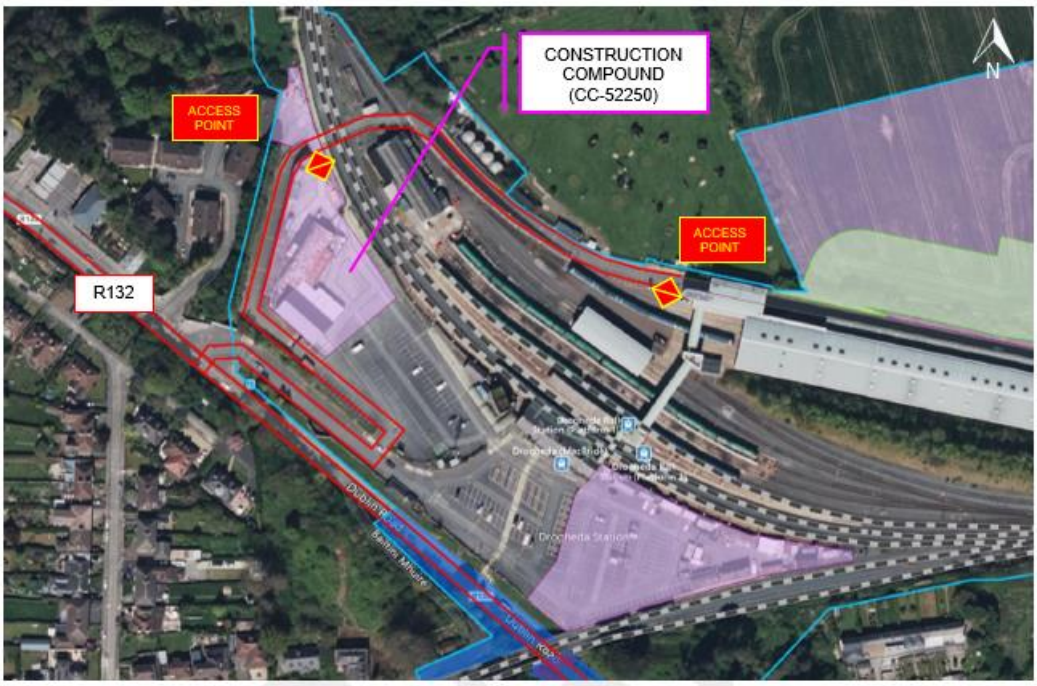


Image 6-53 Drogheda Substation Construction Compound and Access Route

Image 6-54 Drogheda Substation Construction Compound and Alternative Access Route

Depot Light Maintenance Roads and UFC facility

Access to the Depot Construction Compound will be via the same route as shown for the substation.

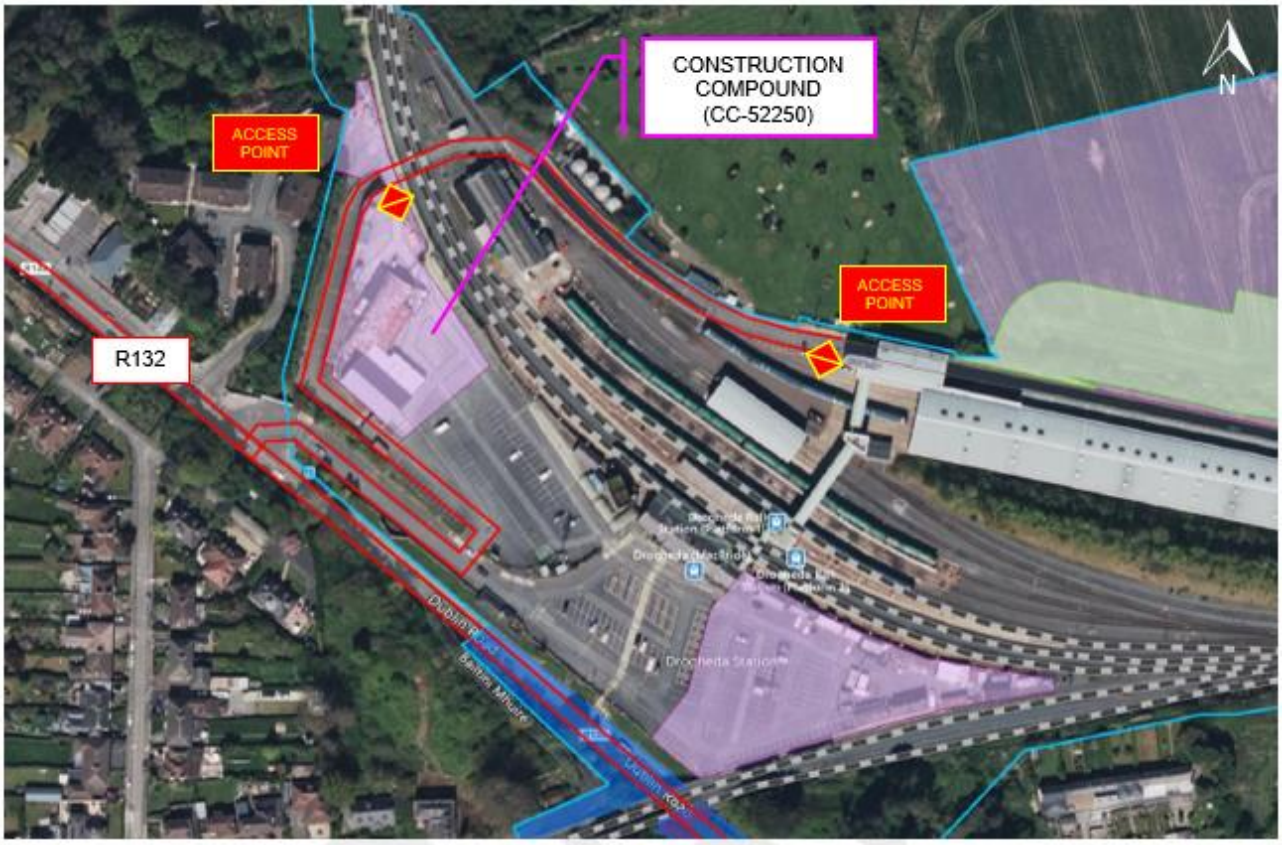


Image 6-55 Depot Construction Compound and Access Routes

6.5.1.4 Abnormal Loads

The M1 and M50 have been identified as a typical construction traffic and abnormal load designated routes, refer to S.I. No. 461/2010 – Road Traffic (Specialised Vehicle Permits) (Amendment) Regulations 2010. From the M1 and M50, Regional Roads (R-Routes) will be the main delivery routes to compounds as far as possible.

A review of the delivery routes to the compounds was carried out. The proposed delivery routes have been analysed, based on the Google maps visuals, OS, and topographical information available, to identify any potential pinch points for both abnormal loads and typical construction traffic.

Vehicle tracking was undertaken where more challenging sites were identified, and additional land was taken where necessary to provide turning points.

The contractor will be required to inspect the delivery routes to identify any issues and propose remedial measures as part of the permitting requirements for abnormal loads. This should include a detailed swept path analyses for the contractor's specific vehicle type and weight (dimensions to be confirmed) to ensure that the specific abnormal load can be transported safely. Permits are managed by An Garda Síochána.

The transportation of abnormal loads will be limited to nighttime hours.

Local temporary access widening into the construction compounds will be incorporated to ensure abnormal loads can exit the public road during delivery.

A designated area for abnormal load parking will be made available within the contractor compound for unloading.

Temporary traffic arrangements will be in place to accommodate wide turning circles at compound access points, such as stop/go road closures or equivalent arrangements to maintain local access and safely accommodate through traffic.

A dry run will be carried out and measures to ensure public safety during abnormal load delivery will be identified.

These measures will be detailed in the contractor's CTMP and agreed by the contractor with the local authority and An Garda Síochána prior to delivery.

6.5.1.5 Construction Activities

Construction activities are required along the length of the rail line. The key activities in each zone are presented in Chapter 5 (Construction Strategy).

6.5.1.6 Construction Working Hours

A key consideration in the design of the construction strategy and programme is the requirement to reduce the impact during construction, on the operation of the railway line and hence, to maintain rail services for passengers. The construction works range from those that are located outside of the railway boundary (thus, having no impact or minimal impact on train operations) to those that will require a temporary closure of a section of railway line (normally during night-time or weekend possessions) to allow construction to proceed and to limit the impact on rail services.

The general construction hours proposed for works outside of the railway boundary are:

- Monday to Friday 07:00 to 19:00 (12 hours);
- Saturday 08:00 to 14:00 (6 hours); and
- Sunday Only when agreed in advance with the local authority and IÉ.

Where required, track possession times would vary across the route. The times listed below are indicative and are likely to be utilised to a greater or lesser degree depending on likely disruption of railway operations. Non-disruptive track possessions are those possessions which occur outside of the general operational timetable for the railway line, whereas disruptive possessions refer to those track possessions where normal railway operations are disrupted.

Any proposed track possession periods would be finalised when detailed design and detailed construction planning is undertaken. This assessment has been undertaken using the reasonable worst case scenario, to ensure that there is a robust assessment.

In general, night-time possessions will be utilised, but is anticipated that a number of daytime and weekend possessions will also be required, to accommodate the construction works. These possessions will be planned with other railway works and peak railway user demand periods in mind. Specific possession hours would be advised nearer the start of construction however, possible types of track possessions are noted in Table 6-19.

Table 6-19 Possession Types and Durations

Possession Type	**Duration / Timings**
Non-disruptive Weekday night	4 hours / 01:00 to 05:00
Non-disruptive Saturday night	6 hours / 01:00 to 07:00
Disruptive Extended Saturday night	10-12 hours
Disruptive Long Weekend (October and Easter)	3-4 days, twice per year
Disruptive Full weekend	52 hours/Saturday morning at 01:00 to Monday morning at 05:00
Disruptive Bank Holiday weekend	72-76 hours/for example Saturday morning at 01:00 to Tuesday morning at 05:00
Disruptive Single Line working at weekends	This may be feasible in specific locations, especially at Malahide, if design and logistics dictate, to retain reasonable schedule and costs.

There are a number of Construction Compounds identified for the Proposed Development. Given that some works need to be undertaken when the railway is closed to train services, these Construction Compounds would often need to be active at night and at weekends. At these times, contractors would be marshalling construction plant and materials via the Construction Compounds, involving both road and rail vehicles. Many deliveries to the compounds can be made during daytime hours, to reduce disturbance at night for the local community and this will be planned and implemented wherever possible during the construction works. Wherever practicable, measures will be taken to minimise impacts in the vicinity of Construction Compounds during night-time works. For example, where night time concrete operations are required, a contractor might obtain their concrete from a local concrete batching plant, or batch it themselves, drive it to a trackside compound, transfer the wet concrete to a suitable vehicle (e.g. RRV dumper) and then transport it along the railway.

6.5.1.7 Construction Trips

The construction materials required at each compound were analysed and this information was used to identify the number of HGV and LV trips required to transport the materials. This trip data was analysed to identify the additional number of heavy goods vehicles (HGV) and light vehicles (LV)/worker trips which would be generated by each compound at their peak trip generation times.

A reasonable worse case assumption in this chapter is that all earthworks deliveries will be via the road, however the option to deliver some material by rail will be considered by the contractor.

The weekday AM and PM peak hours during the peak Construction Phase for each location have been assessed.

Table 6-20 Construction Vehicle Trips

Zone	Compound Code	Compound	Working Hours	Peak Duration	Peak Hour two-way vehicular trips		
					HGV	LV	Total
A	CC-2650	Fairview Depot (R834 Entrance car park)	Night & Day Time	6 months	1	4	5
A	CC-2700	Fairview Depot (R834 Entrance car park)	Night & Day Time	6 months	1	4	5
A	CC-3000	Fairview Depot (R807 Entrance car park)	Night & Day Time	6 months	1	4	5
B	CC-9000	Howth Junction and Donaghmede Station (Donaghmede Entrance)	Night & Day Time	2 years	2	6	8
B	CC-9050	Howth Junction and Donaghmede Station (Kilbarrack Entrance)	Night & Day Time	2 years	2	6	8
B	CC-9100	Howth Junction and Donaghmede Station (Central Access)	Night & Day Time	2 years	2	6	8
B	CC-9200	Howth Junction and Donaghmede Station (Baldoyle Industrial Estate)	Night & Day Time	2 years	2	6	8
B	CC-10600	Clongriffin Station	Night & Day Time	12 months	6	6	12
B	CC-15900E	Malahide Turnback (Strand Court)	Night & Day Time	6 months	6	6	12
B	CC-15900W	Malahide Turnback (Bissets Strand)	Night & Day Time	6 months	6	6	12
B	CC-16100	Malahide Turnback (Caves Strand)	Night & Day Time	6 months	6	6	12
B	CC-16250	Malahide Turnback (Marina Car Park)	Night & Day Time	6 months	6	6	12
B	CC-16400	UBB30 Malahide Viaduct	Night & Day Time	3 months	1	2	3
C	CC-18800	Donabate Traction Substation	Night & Day Time	2 years	4	7	11
C	CC-19800	Donabate Station	Night & Day Time	2 years	4	7	11
C	CC-21500	UBB36 Rogerstown Viaduct	Night & Day Time	3 months	1	2	3

Zone	Compound Code	Compound	Working Hours	Peak Duration	Peak Hour two-way vehicular trips		
					HGV	LV	Total
C	CC-23500	Rush and Lusk Station	Night & Day Time	2 years	3	6	9
C	CC-23772 (E)	Rush & Lusk Utility Diversions	Day Time	1 month	1	5	6
C	CC-23772 (W)	Rush & Lusk Utility Diversions	Day Time	1 month	1	5	6
C	CC-25100	OBB44 Track Lowering	Night & Day Time	1 month	2	3	5
C	CC-25626 (E)	Tyrelstown Utility Diversion	Day Time	1 month	1	5	6
C	CC-25626 (W)	Tyrelstown Utility Diversion	Day Time	1 month	1	5	6
C	CC-27460 (E)	Baldongan Utility Diversion	Day Time	1 month	1	5	6
C	CC-27460 (W)	Baldongan Utility Diversion	Day Time	1 month	1	5	6
C	CC-29000	Skerries South Traction Substation	Day Time	6 months	2	6	8
C	CC-29140 (E)	Golf Links Road Utility Diversion	Day Time	2 weeks	1	5	6
C	CC-29140 (W)	Golf Links Road Utility Diversion	Day Time	2 weeks	1	5	6
C	CC-30200	Skerries Station	Night & Day Time	2 years	6	6	12
C	CC-32200	Skerries North Traction Substation	Day Time	6 months	2	6	8
C	CC-34400 (E)	Balbriggan Utility Diversion	Day Time	1 month	1	5	6
C	CC-34400 (W)	Balbriggan Utility Diversion	Day Time	1 month	1	5	6
C	CC-36000	UBB56 Balbriggan Viaduct	Night & Day Time	3 months	1	2	3

Zone	Compound Code	Compound	Working Hours	Peak Duration	Peak Hour two-way vehicular trips		
					HGV	LV	Total
C	CC-37700	Balbriggan Traction Substation	Night & Day Time	2 years	6	6	12
D	CC-40200	Gormanston Station	Night & Day Time	2 years	6	6	12
D	CC-41400	Gormanston Traction Substation	Day Time	6 months	2	6	8
D	CC-44390 (E)	Laytown Utility Diversion	Day Time	1 month	1	5	6
D	CC-44390 (W)	Laytown Utility Diversion	Day Time	1 month	1	5	6
D	CC-44500	UBB72 Laytown Viaduct (South Abutment)	Night & Day Time	3 months	0	1	1
D	CC-44600	UBB72 Laytown Viaduct (South Pier)	Night & Day Time	3 months	0	1	1
D	CC-44700	UBB72 Laytown Viaduct (North Pier)	Night & Day Time	3 months	1	2	3
D	CC-44900	Laytown Station	Night & Day Time	2 years	6	6	12
D	CC-44920 (E)	Laytown Utility Diversion	Day Time	1 month	1	5	6
D	CC-46900	Bettystown Traction Substation	Day Time	6 months	2	6	8
D	CC-49600	OBB78 Track Lowering	Night & Day Time	1 month	0	3	3
D	CC-50270 (S)	Drogheda Utility Diversion	Day Time	1 month	1	5	6
D	CC-50270 (N)	Drogheda Utility Diversion	Day Time	1 month	1	5	6
D	CC-51700 (S)	Drogheda Utility Diversion	Day Time	1 month	1	5	6
E	CC-51800	OBB80 McGrath's Lane Overbridge (North)	Night & Day Time	1 year	6	6	12
E	CC-51900	OBB80 McGrath's Lane Overbridge (South)	Night & Day Time	3 months	6	6	12
E	CC-52050	Drogheda Traction Substation	Day Time	6 months	2	6	8

Zone	Compound Code	Compound	Working Hours	Peak Duration	Peak Hour two-way vehicular trips		
					HGV	LV	Total
E	CC-52250	Drogheda Depot/Station	Night & Day Time	6 months	6	6	12
E	CC-52200	UBK01 Dublin Road Overbridge (Car Park)	Night & Day Time	2 years	2	6	8

Table 6-20 illustrates that the level of trips generated by each of the compounds would not exceed more than one additional vehicle per minute on the network. It also shows that for a number of the compound locations, peak trip volumes will be generated for a very short time.

Furthermore, it should be noted that not all of the trips identified in the table above would occur at the same time, rather they would be spread across the Construction Phase of the Proposed Development further limiting the impact. The peak hour trips identified in the table above have been distributed across the network as discussed in the following section.

6.5.1.8 Construction Impacts

Due to the length of the proposed programme and the proposed staggering of construction works, not all works will be undertaken at once. However, for a robust assessment of the worst case, the assessment undertaken assumes that the construction impacts would occur at the same time, although this is unlikely to be the case.

The impacts are therefore considered to be less than identified in the assessment discussed below. Undertaking a robust assessment where construction is concerned ensures that any mitigation requirements are not underestimated. On this basis, worst case construction scenarios have been taken forward within the assessments.

6.5.1.8.1 Construction Impact of Construction Trips

The construction year adopted for the purposes of this assessment is 2026 and the traffic data along construction access routes were interpolated between base year (2019) and opening year (2028) to estimate the likely traffic conditions during construction. This data was obtained from the ERM and DLAM models described previously in Section 6.3.3.3. This is the “Do Something” scenario being assessed, as it assumes the commencing of construction of the project in 2026.

The construction year assessed is 2026, as this is when construction is expected to begin and is when it is expected to generate the most trips. For the assessment below, it is assumed that all of the construction work is occurring concurrently, with all of the construction considered to take place over the course of an entire year, even though realistically construction will last for three years. This is a highly conservative assessment scenario as most works items of said nature are estimated to have a duration of less than 12 months; with other compounds serving short duration works that potentially only last 1 month. Phasing of works was shown previously in the high-level construction programme, Image 6-29.

The impact on the road network during the weekday AM and PM peak hours are set out in Table 6-21. It should be noted that where there is a 0% change in traffic flows between the Do Minimum (No Construction) and Do Something (With Construction) scenarios, these have not been included in the table.

Table 6-21 Construction Impact - AM and PM Weekday

			AM Peak (Number of trips)			PM Peak (Number of trips)		
Zone	Junction	Road Name	Do Minimum	Do Something	% change	Do Minimum	Do Something	% change
A	Alfie Byrne Road / Eastpoint	Alfie Byrne Road North	1355	1363	1%	309	316	2%
		Eastpoint	188	195	4%	338	346	2%
		Alfie Byrne Road South	425	433	2%	83	90	9%
A	R807 / Alfie Byrne Road	R807 Clontarf Road West	695	703	1%	252	260	3%
		R807 Clontarf Road East	1351	1358	1%	463	471	2%
		Alfie Byrne Road	355	363	2%	153	161	5%
A	R807 / R105 Howth Road	R105 Howth Road	667	675	1%	455	462	2%
		R807 Clontarf Road East	446	453	2%	1444	1452	1%
		R807 Clontarf Road West	647	654	1%	62	70	12%
A	Verbena Avenue / R104	Verbena Avenue	96	108	13%	~5	12	120%
		R104 Kilbarrack Road East	85	97	14%	89	101	14%
		R104 Kilbarrack Road West	205	217	6%	88	100	14%
A	R104 / Thornville Roadd	R104 Kilbarrack Road West	335	347	4%	18	30	68%
		R104 Kilbarrack Road East	112	124	11%	37	49	32%
		Thornville Road	135	147	9%	13	25	93%
A	Kilbarrack Parade / R104	Kilbarrack Parade	85	97	14%	29	41	41%
		R104 Kilbarrack Road East	243	255	5%	9	21	129%
		R104 Kilbarrack Road West	433	445	3%	5	17	222%
A	St Donagh's Park / R104	St. Donagh's Park	357	369	3%	259	271	5%
		R104 Kilbarrack Road East	318	330	4%	240	252	5%
		R104 Kilbarrack Road West	188	200	6%	214	226	6%
A	R104 / Swan's Nest Avenue	R104 Kilbarrack Road East	242	254	5%	10	22	117%
		Swan's Nest Ave	17	29	72%	253	265	5%
		R104 Kilbarrack Road West	173	185	7%	5	17	227%
A	St Donagh's Road / St. Donagh's Park	St. Donagh's Park	188	200	6%	50	62	24%
		St. Donagh's Road West	1	13	1200%	67	79	18%
		St. Donagh's Road East	357	369	3%	4	16	287%
A	Grange Road / St. Donagh's Road	Grange Road North	440	452	3%	25	37	48%
		St. Donagh's Road	1	13	1200%	189	201	6%
		Grange Rd South	429	441	3%	152	164	8%

			AM Peak (Number of trips)			PM Peak (Number of trips)		
Zone	Junction	Road Name	Do Minimum	Do Something	% change	Do Minimum	Do Something	% change
B	Longfield Road / R139	Longfield Road	225	237	5%	53	65	23%
		R139 Grange Road East	445	457	3%	259	271	5%
		Grange Rise	36	48	33%	~5	12	120%
		R139 Grange Road West	596	608	2%	80	92	15%
B	R106 Coast Road / Red Arches Road	R106 Coast Road South	396	402	2%	969	975	1%
		Red Arches Road	74	80	8%	592	598	1%
		R106 Coast Road North	604	610	1%	835	841	1%
B	R106 Coast Road / R123	R106 Coast Road South	389	395	2%	534	540	1%
		R123 Moyne Road	126	132	5%	188	194	3%
		R106 Coast Road North	500	506	1%	246	252	2%
B	R123 / R124	R123 East	196	202	3%	439	445	1%
		R123 West	425	431	1%	1278	1284	0%
		R124 North / Drumnigh Road	487	493	1%	335	341	2%
B	Park Avenue / Marsfield Avenue	Park Avenue	97	103	6%	216	222	3%
B	R106 / Yellow Walls Road	R106 Dublin Road(ENE)	1268	1280	1%	1255	1267	1%
		R106 Dublin Road(WSW)	883	895	1%	820	832	1%
		Yellow Walls Road	611	623	2%	591	603	2%
B	The Haven / Texas Ln / Caves Strand	The Haven	446	458	3%	474	486	3%
		Texas Lane	176	188	7%	121	133	10%
		Caves Strand	369	381	3%	381	393	3%
B	Sea Road / Yellow Wals Road / Millview Road / Old Yellow Walls Road	Sea Road	633	645	2%	454	466	3%
		Yellow Walls Road	527	539	2%	560	572	2%
		Millview Road	375	387	3%	287	299	4%
		Old Yellow Walls Road	785	797	2%	810	822	1%
B	New Street / Church Street	R106 Main Street	631	644	2%	318	331	4%
		R106 the Mall	346	359	4%	158	171	9%
B	Old Street / R106	Old Street	139	151	9%	166	178	7%
B	James' Terrace / R106	James' Terrace	329	341	4%	357	369	3%
C	Hearse Road / Kilcrea	Hearse Road East	119	125	5%	24	30	23%
		Hearse Road West	80	85	7%	37	42	15%

			AM Peak (Number of trips)			PM Peak (Number of trips)		
Zone	Junction	Road Name	Do Minimum	Do Something	% change	Do Minimum	Do Something	% change
C	Hearse Road / R126	R126 East	451	456	1%	353	358	2%
		Hearse Road	40	45	14%	65	70	8%
		R126 West	369	374	1%	390	395	1%
C	Main St/Chapel View	Main Street	428	433	1%	335	341	2%
		Chapel View	40	45	14%	33	38	17%
		R126	424	430	1%	499	505	1%
C	R127 / Newhaggard	Newhaggard	121	123	1%	1	2	100%
C	R128 / Rogerstown Lane	R128 East	688	692	1%	342	346	1%
		R128 West	300	305	1%	534	539	1%
C	R128 / Effelstown	R128 East	688	692	1%	342	346	1%
		R128 West	300	305	1%	587	592	1%
C	Tyrelstown Big / Whitestown Road	Whitestown Road	70	73	4%	33	35	8%
C	Baldongan / Ballykea	Ballykea	30	34	13%	82	86	5%
C	Golf Links Road / Baldongan	Golf Links Road North	43	47	9%	5	9	80%
C	Golf Links Road / Shenick Road	Golf Links Road South	32	38	19%	46	52	13%
C	Miller's Lane / R127	R127 North	398	404	2%	200	206	3%
C	R127 / Barnageeragh Road	R127 South	185	191	3%	260	266	2%
		Barnageeragh Road	282	288	2%	99	105	6%
C	Barnageeragh Rd/The Green	Barnageeragh Road East	94	100	6%	172	178	3%
		Barnageragh Road West	152	158	4%	66	72	9%
C	Barnageeragh Hill / Grange Lodge Avenue	Barnageeragh Hill East	88	92	5%	41	45	10%
C	Balbriggan Road / Barnageeragh Road	Barnageeragh Road	221	225	2%	182	186	2%
		R127 Skerries Road	287	291	1%	228	232	2%
C	Market Green / Hampton Street	Hampton Street	244	245	1%	198	200	1%

			AM Peak (Number of trips)			PM Peak (Number of trips)		
Zone	Junction	Road Name	Do Minimum	Do Something	% change	Do Minimum	Do Something	% change
C	R132 Dublin Street / Market Green	R132 Dublin Street North	216	217	1%	117	118	1%
C	R132 Dublin Street / The Square	The Square	238	239	1%	219	220	1%
		R132 Dublin Street	159	160	1%	275	276	1%
		Bridge St	459	461	0%	313	315	0%
C	Harry Reynolds Road / Naul Road	Clonard Street	93	95	2%	66	67	2%
C	Bridge Street / Clonard Street	Bridge Street	404	405	0%	499	501	0%
		Clonard Street	53	54	3%	29	30	5%
		Drogheda Street	527	529	0%	348	350	0%
C	R132 Drogheda Street / Chapel Street	Drogheda Street South	430	431	0%	503	504	0%
C	R132 Drogheda Street / Hamlet Lane	Drogheda Street North	376	392	4%	263	279	6%
D	R132 Drogheda At / Flemington Lane	R132 Drogheda Street South	280	296	6%	314	330	5%
		Flemington Lane	81	97	20%	65	81	25%
		R132 Drogheda Street North	396	412	4%	304	320	5%
D	Flemington Lane / Dun Saithne Road	Flemington Lane East	65	81	25%	64	80	25%
D	R132 / Knocknagin Lane	R132 South	325	341	5%	361	377	4%
		R132 North	384	400	4%	305	321	5%
D	R132 / L1616 Flemington Rd	R132 South	329	385	17%	407	463	14%
		R132 North	372	428	15%	277	333	20%
D	R132 / Balbriggan Bypass	R132 East	961	1017	6%	582	623	7%
D	R132 Drogheda Road North / South	R132 Drogheda Road South	309	365	18%	373	429	15%
		R132 Drogheda Road North	372	428	15%	277	333	20%
D	R132 / Balbriggan Bypass	Balbriggan Bypass	661	717	8%	1227	1283	5%
		R132 North	1226	1282	5%	777	833	7%
D	R132 / Moorechurch	R132 South	661	717	8%	1227	1283	5%
D		R132 South	597	653	9%	1011	1067	6%

			AM Peak (Number of trips)			PM Peak (Number of trips)		
Zone	Junction	Road Name	Do Minimum	Do Something	% change	Do Minimum	Do Something	% change
	R132 / Whitecross Glebe	R132 North	1224	1280	5%	709	765	8%
D	R132 Main Street / Duleek Road	R132 Main Street	1092	1148	5%	508	564	11%
		R132 South	629	685	9%	1199	1255	5%
D	R132 Main Street / Laytown Road	R132 Main Street South	491	547	11%	1064	1120	5%
		R150 Laytown Road	522	578	11%	203	259	28%
D	Laytown Road / Ministown Road	R150 Laytown Road West	151	207	37%	551	607	10%
		Ministon Road	321	377	17%	106	162	53%
		R150 Laytown Road East	234	290	24%	118	174	48%
D	Ministown Road / Pilltown Road	Pilltown Road West	12	68	456%	12	68	484%
		Pilltown Road East	335	391	17%	111	167	51%
		Ministown Road	83	139	68%	323	379	17%
D	R150 Triton Road / L5362	L5362	100	156	56%	90	146	62%
		R150 Triton Road	104	160	54%	34	90	165%
D	R150 / Strandview Terrace	R150 Coast Road	11	67	519%	13	69	430%
		R150 Triton Road	104	160	54%	34	90	165%
		Golf Links Road	16	72	351%	6	62	908%
D	R150 Coast Road / L5632	R150 Coast Road North	120	176	47%	40	96	139%
		R150 coast Road South	111	167	51%	103	159	54%
D	R150 Eastham Road / L5615 Pilltown Road	L5615 Pilltown Road	93	149	60%	345	401	16%
		R150 Eastham Road	667	723	8%	305	361	18%
		Bettystown Road	244	300	23%	270	326	21%
D	Colpe Road / Mill Road	Costal Scenic Drive	248	304	23%	336	392	17%
		Colpe Road	317	373	18%	174	230	32%
		Mill Road	44	100	128%	38	94	146%
D	Marsh Road / Mill Road	Marsh Road West	214	270	26%	294	350	19%
		Mill Road	60	116	93%	43	99	132%
E	R132 Dublin Road / Bryanstown Village	R132 Dublin Road South	586	642	10%	536	592	10%
		R132 Dublin Road North	440	496	13%	463	519	12%
		Bryanstown Village	167	223	34%	165	221	34%
E	Meadow View / Blackbush Lane	Blackbush Lane	103	159	54%	79	135	71%
		Meadow View East	222	278	25%	181	237	31%

			AM Peak (Number of trips)			PM Peak (Number of trips)		
Zone	Junction	Road Name	Do Minimum	Do Something	% change	Do Minimum	Do Something	% change
E	Blackbush Lane / Bailtini Mhuire	Blackbush Lane	84	140	66%	85	141	66%
		Sunnyside Cottages	103	159	54%	79	135	71%
E	R132 Dublin Road / Bailtini Mhuire	R132 Dublin Road North	440	496	13%	463	519	12%
		R132 Dublin Road South	465	521	12%	421	477	13%
E	R132 Dublin Road / Sunnyside Cottages	R132 Dublin Road East	465	521	12%	421	477	13%
		Sunnyside Cottages	84	140	66%	85	141	66%
		R132 Dublin Road West	544	600	10%	541	597	10%

In terms of the environmental impact these effects of construction trips can be classified as **negative short-term effects, or temporary** in cases where the duration will be less than a year. In terms of the significance of these impacts the following classification system was applied:

- "Not Significant" for changes between 0% and 5% vehicles; or additional volumes less than 10 vehicles;
- "Slight Effects" for changes between 5% and 10% vehicles;
- "Moderate Effects" for changes between 10% and 25% vehicles; and
- "Significant Effects" for changes over 25% vehicles, only if additional volumes are more than 50 vehicles.

The results set out above illustrate that during the Construction Phase in Zones D and E the Proposed Development will generally have a **negative, moderate effect** on traffic flows. The construction traffic utilises many of the same links to each compound in Zones D and E. This will be a **short-term effect**, as construction will be less than 3 years in total, with some of the activities in these zones lasting under one year.

In Zones A, B and C during the Construction Phase, the Proposed Development will generally have a **negative, slight effect** on traffic flow. Traffic flows are generally below an additional 20 vehicles per link during peak hours. This will be a **short-term effect**, as construction will be less than 3 years in total, with some of the activities in these zones lasting under one year.

The construction traffic, although assessed to occur on the road network in the AM and PM peaks would be managed such that it does not occur at this time where practicable further reducing the impact of the Construction Phase of the Proposed Development. Overall, the construction vehicles on the network represent a **negative, moderate, short-term effect** for the duration of construction, before returning to normal levels once the construction is complete.

6.5.1.8.2 Construction Impact of Road Closures

The proposed working areas, works type, planned road closures, and work durations are provided in this section. The potential effects of the proposed road closures on traffic and transportation are also provided for each work area.

The effect of the temporary partial road closures on road transport will a be **negative, slight, temporary effect**.

However, in the following cases the effect of the temporary full/total road closures on road transport will be a **negative, moderate, temporary effect**:

- Balbriggan Viaduct: Harbour Road closure at night or limited to weekends during fitting of large footbridge elements;
- Drogheda (UBK01): partial road closures and some full road closures limited to weekends of Dublin Road (R132) and diversion of Bus Routes (D4, D5, 101, 101X); and
- Beaverstown Golf Club Access, Rogerstown Lane and L1620 Station Road full road closures during utilities diversion.

In addition, in respect of the location below, the effect of the temporary full road closure on road transport will be a **negative, significant, temporary effect**:

- Drogheda (OBB80): Full road closure of Railway Terrace from demolition of OBB80 until reopening (18 months).

These effects are relevant for private cars, pedestrians, cyclists and buses.

See Table 6-22 for duration of closures and impacts of road closures in Table 6-22.

Table 6-22 Proposed Road Closures due to Construction

Road	Closure Type	Reason	Approximate Duration
R126	Partial	Utility diversion	4 weeks
Donabate Station access (Turvey Avenue)	Partial	Utility diversion	1 week
Beaverstown Golf Club access	Full (local access for pedestrians maintained) Partial	Utility diversion	3 days 1 week
Rogerstown Lane	Full (local access for all modes maintained)	Utility diversion	1 week
R128	Partial	Utility diversion	2 weeks
Horestown Road	Partial	Utility diversion	1 week
L1285	Partial	Utility diversion	2 weeks

Road	Closure Type	Reason	Approximate Duration
L1357 Barnageeragh Road	Partial	New Track Paralleling Hut (TPH)	12 weeks
L1270	Partial	Skerries South substation access	2 weeks
L1270	Partial	Utility diversion	1 week
R127	Partial	Utility diversion	2 weeks
R127	Partial	Utility diversion	4 weeks
R127	Partial	Utility diversion	1 week
Seapoint Lane	Partial	Utility diversion	1 week
Harbour Road	Partial	UBB56 modification	1 week
L1620 Station Road	Partial	Utility diversion	1 week
L1620 Station Road	Full	Utility diversion	3 days
Coastview Cottages	Partial	UBB72 modification	8 weeks
L5615	Partial	Utility diversion	1 week
Local Road	Partial	Utility diversion	1 week
Wheaton Hall Road	Partial	Utility diversion	1 week
McGrath's Lane	Partial	OBB80/80A/80B reconstruction	104 weeks
Railway Terrace beyond houses	Full (local access for all modes maintained through temporary access road)	OBB80/80A/80B reconstruction	104 weeks
R132	Partial	UBK01 widening	26 weeks
R132	Full (local access for all modes maintained)	UBK01 widening	Some weekends
St Mary's Villas	Partial (May have periods of full closure at weekends)	UBK01 widening	26 weeks Some weekends

Table 6-23 Construction Impacts on Road Network

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Fairview depot	Fairview depot	Minor modifications to the depot including new cleaning facilities.	12 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Site setup, transportation of plant and materials via HGV.	Negative	Slight effects	Temporary effects
Howth Junction	Howth Junction and Donaghmede Station	Platform extension, track works, station entrance and footbridge modifications.	24 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Clongriffin	Clongriffin Station	Construction of new turnback on Platform 0 including retaining wall to east of tracks.	12 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Malahide	Malahide Turnback	Construction of a turnback on a widened embankment between the Strand Road underbridge (UBB29) and the Malahide Viaduct (UBB30). Construction of a new modular reinforced earth wall and earthworks slope on the west side of the existing embankment.	18 months	Standard working hours 5.5 days / week. Some work will be performed overnight and in full weekend possessions.	Site setup, transportation of plant and materials via HGV. Broadmeadow Greenway width reduced to a minimum 3m. Access to wastewater treatment to be shared with the contractor with suitable traffic management measures in place.	Negative	Slight effects	Short-term effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Malahide	Malahide Viaduct	Addition of 3No. OHLE supports to viaduct.	3 months	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Donabate	XB001 Level Crossing	Level crossing to be closed.	1 month	Overnight or weekend track possessions.	No impact. Access by rail planned.	Negative	Imperceptible	Temporary effects
Donabate	Traction Substation	Temporary Construction Compound to support line wide OHLE installation and construction of permanent substation.	36 months	Line-wide works in overnight / weekend track possessions, substation works will be standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Donabate	OBB32A	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Donabate	Donabate Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Donabate	OBB33A	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Donabate	OBB35	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Rogerstown	Rogerstown Viaduct	Addition of 2No. OHLE supports to viaduct abutments.	3 months	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Donabate	OBB38	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects
Rush and Lusk	Rush and Lusk Traction Substation	Temporary Construction Compound to support line wide OHLE installation and construction of permanent substation.	36 months	Line-wide works in overnight / weekend track possessions, substation works will be standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Rush and Lusk	OBB38A	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Rush and Lusk	OBB39	Track lowering.	1 month	Weekend track possessions.	Works to be supported from Rush and Lusk line-wide compound.	Negative	Imperceptible	Temporary effects
Donabate	OBB41	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects
Rush and Lusk	OBB44	Track lowering.	1 month	Weekend track possessions.	Transportation of plant and materials via HGV. Supported from local compound or Rush and	Negative	Not significant	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
					Lusk line-wide compound.			
Baldongan	OBB46	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects
Baldongan	OBB47	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects
Skerries	Skerries South Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Skerries	OBB49	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects
Skerries	Golf Links Road UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Skerries	Skerries Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Skerries	OBB51A	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Skerries	Skerries North Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Skerries	Barnageerah UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Skerries	OBB54	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Balbriggan	Skerries Road South UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Balbriggan	Skerries Road North UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Balbriggan	OBB55	Parapet modifications to road overbridge and track lowering.	1 month	Overnight and weekend track possessions.	For parapet modifications, road under traffic management. For track lowering no impact, access by rail planned.	Negative	Slight effects	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Balbriggan	Balbriggan Viaduct	Addition of 2No. OHLE supports to viaduct.	3 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV. Road closure during lifting large footbridge elements.	Negative	Moderate effects	Temporary effects
Balbriggan	OBB57A	Parapet modifications to station footbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Balbriggan	Balbriggan Traction Substation	Temporary Construction Compound to support line wide OHLE installation and construction of permanent substation.	36 months	Line-wide works in overnight / weekend track possessions, substation works will be standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Gormanston	Drogheda Street UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Gormanston	Gormanston Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Gormanston	Station Road UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Gormanston	Gormanston Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Gormanston	OBB68	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Road under traffic management to access parapets, likely one-way traffic lights.	Negative	Slight effects	Temporary effects
Laytown	Delany Cottages South UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Laytown	Delany Cottages North UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days/week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Laytown	Laytown Viaduct	Addition of 2No. OHLE supports to viaduct.	3 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Laytown	Laytown Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effects
Laytown	OBB74A	Parapet modifications to station footbridge.	1 month	Overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Laytown	The Grove UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Bettystown	Bettystown Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Bettystown	Draycott Lodge UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	Colpe East UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	OBB78	Parapet modifications to road overbridge and track lowering.	1 month	Overnight and weekend track possessions.	For parapet modifications, road under traffic management. For track lowering no impact, access by rail planned.	Negative	Slight effects	Temporary effects
Drogheda	Park Wood UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	Weavers Way UTX	Utility under track crossing.	3 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	OBB80	Temporary Construction Compound to support line wide OHLE installation and reconstruction of overbridge.	12 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV. Full road closure from	Negative	Significant effects	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Road Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
					demolition until reopening.			
Drogheda	UBK01	Dublin Road bridge reconstruction.	24 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Site setup, transportation of plant and materials via HGV. One-way traffic and some full road closures of Dublin Road (limited to weekends).	Negative	Moderate effects	Short-term effects
Drogheda	OBB81	Station footbridge reconstruction.	3 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	Drogheda Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	Drogheda Station	New platform 4 on Navan Line.	6 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Temporary effects
Drogheda	Depot and stabling roads	Minor modifications to the depot including new cleaning facilities and stabling roads.	24 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Site setup, transportation of plant and materials via HGV.	Negative	Not significant	Short-term effect

6.5.1.8.3 Construction Impact on Car Parking

In order to provide a number of the compounds over the construction period, there will be a temporary loss of car parking at locations along the length of the railway line, at 6 of the stations. Table 6-24 below sets out the number of spaces lost on a temporary or permanent basis as a result of construction.

Table 6-24 Parking Loss Due to Construction

Code	Location	Temporary		Justification
		Public Access Parking	Private Access Parking	
CC-2650	Fairview Depot (R834 Entrance car park)	none provided	15	Minor modifications to depot for greater output of cleaning for increased fleet. Modifications on east and west platforms for suitable access and services for cleaning staff.
CC-2700	Fairview Depot (R834 Entrance car park)	none provided	5	
CC-3000	Fairview Depot (R807 Entrance car park)	none provided	15	
CC-9050	Howth Junction and Donaghmede Station (Kilbarrack Entrance)	10	none provided	The compounds are required for construction of platform extension, new crossover, and increased station access.
CC-9200	Howth Junction and Donaghmede Station (Baldoyle Industrial Estate)	none provided	80	
CC-15900E	Malahide Turnback (Strand Court)	none provided	10	This current car park will be mostly used as an access route for the construction of a turnback north of Malahide station.
CC-15900W	Malahide Turnback (Bissett's Strand)	10 on-street parking bays	non provided	The Bissett's Strand cross-section will be required for turning movements and access into this compound.
CC-16250	Malahide Turnback (Marina Car Park)	60	none provided	The marina car park will act as the largest compound for the continuation of works for the turnback.
CC-19800	Donabate Station	150	none provided	The Donabate Station car park area is a potential line-wide compound, which supports the new OHLE construction works.
CC-23500	Rush and Lusk Station	30	none provided	Land acquired for access to construction compound at the southern end of the car park on the eastern side of the rail line.

Code	Location	Temporary		Justification
		Public Access Parking	Private Access Parking	
CC-36000	UBB56 Balbriggan Viaduct	20	none provided	Car park will act as a compound for construction taking place to the adjacent viaduct for a pedestrian footway.
CC-52250	Drogheda Depot/Station	30	none provided	The site at the northern end of the Train Station car park will be used throughout the development of the Depot Light Maintenance Roads and UFC facility
CC-52200	UBK01 Dublin Road Overbridge (Car Park)	110	none provided	The Dublin Road Overbridge will be replaced in two phases, with the station car park acting as the main construction compound.

In order to determine if the temporary loss of parking to accommodate the construction works at Howth Junction and Donaghmede Station, Donabate Station, Rush and Lusk Station and Drogheda Station would impact on the users of the car parks, a survey of the number of spaces used at each location was undertaken during the morning peak in January 2020, pre COVID-19 by Iarnród Éireann. The results of the survey are in Table 6-25.

Table 6-25 Station Parking Results

Zone	Station	Existing			During Construction	
		Number of Spaces	Number of Spaces Occupied during AM Peak	Number of Spaces Remaining Available	Number of Spaces Lost	Number of Spaces Remaining Available
B	Howth Junction and Donaghmede Station (Kilbarrack Entrance)	25	22	3	10	**0**
C	Donabate Station	351	143	208	150	**58**
C	Rush and Lusk Station	432	233	199	30	**169**
E	Drogheda Station (Main Carpark (Depot and Overbridge) and Marsh Road)	386[4]	206	180	110	**70**

[4] Drogheda station provides a total of 386 car parking spaces, of which 288 are located in the main car park and 98 in the secondary car park off Marsh Road.

The results set out in the table above illustrate that generally three of the car parks are underutilised with a number of spaces remaining available for use. Once the spaces lost during construction of the Proposed Development are taken into account and assuming the same levels of use as identified during the survey, at Donabate, Rush and Lusk and Drogheda MacBride stations there is still a significant number of spaces remaining available at each car park.

At the Drogheda MacBride station there are two compounds. The Drogheda Depot/Station compound is the site at the northern end of the car park and will be used throughout the development of the Depot Light Maintenance Roads and UFC facility, requiring the removal of 30 spaces for a duration of approximately 11 months. The UBK01 Dublin Road Overbridge compound is the site at the southern end of the car park and will be used for the replacement of the Dublin Road Overbridge (UBK01), requiring the removal of 110 spaces for a duration of approximately 19 months. Pre-Covid surveys have shown that 180 parking spaces are currently underutilised at the station car park (which includes the northern end of the car park, the southern end of the car park and the Marsh Road car park towards the west). However, during the construction of BEMU 53 spaces will be permanently removed from the Marsh Road car park towards the west. In addition, anecdotal evidence exists to suggest that an overspill in parking regularly occurs onto the public road network at the station. This would suggest that the required 140 spaces during construction works cannot be easily accommodated. Therefore, in order to mitigate this potential impact, it is recommended that the contractor be limited to only occupy a maximum of 110 spaces at any one time during the overall period of works, these to be within one or both of the two compounds. It was observed that the Marsh Road car park is currently underutilised, and it will therefore increase in utilisation during construction with proper wayfinding implemented by the contractor during construction.

In terms of impact, this can be classified as a **neutral, slight effect, of short-term duration** on parking at Donabate, Rush and Lusk and Drogheda MacBride Stations.

Howth Junction and Donaghmede Station (Kilbarrack Entrance) will not have any spare capacity during the construction period, as there will be a reduction of 10 car parking spaces from that currently available. In terms of impact, this can be classified as a **negative, moderate effect, of short-term duration** on parking at Howth Junction and Donaghmede Station (Kilbarrack Entrance).

The contractor will minimise the Construction Compound footprint throughout the construction programme and return the maximum number of car spaces back to public use when construction works are completed and the compounds are no longer required.

6.5.1.8.4 Construction Impact on Rail Network

The effects on traffic and transportation of the proposed track possessions are provided at each work area. The track possessions, where required, would take place during weekends and at night time, Table 6-26.

The effect of the temporary track possessions on rail transport, where required, can be classified as **negative, not significant or slight, temporary effects**.

Table 6-26 Rail Possessions

Work Area	Location	Duration	Night-time Possession	Weekend Possession
Fairview depot	Fairview depot	12 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	No weekend possessions.
Howth Junction	Howth Junction and Donaghmede Station	24 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 94 (Saturday) / 60 (Sunday) DART / Irish Rail Services affected.
Clongriffin	Clongriffin Station	12 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	No weekend possessions.
Malahide	Malahide Turnback	18 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 94 (Saturday) / 60 (Sunday) DART / Irish Rail Services affected.
Malahide	Malahide Viaduct	3 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Minimum of six weekend day-time possessions. 94 (Saturday) / 60 (Sunday) DART / Irish Rail Services affected.
Donabate	XB001 Level Crossing	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Donabate	Traction Substation	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Donabate	OBB32A	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Donabate	Donabate Station	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.

Work Area	Location	Duration	Night-time Possession	Weekend Possession
Donabate	OBB33A	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Donabate	OBB35	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Rogerstown	Rogerstown Viaduct	3 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Minimum of four weekend day-time possessions. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Donabate	OBB38	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Rush and Lusk	Rush and Lusk Traction Substation	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Rush and Lusk	OBB38A	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Rush and Lusk	OBB39	1 month	No night-time possessions	Minimum of two weekend day-time possessions. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Donabate	OBB41	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.

Work Area	Location	Duration	Night-time Possession	Weekend Possession
Rush and Lusk	OBB44	1 month	No night time possessions	Minimum of two weekend day-time possessions. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Baldongan	OBB46	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Baldongan	OBB47	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Skerries	OBB49	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Skerries	Skerries Station	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Skerries	OBB51A	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Skerries	OBB54	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Balbriggan	OBB55	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Minimum of two weekend day-time possessions. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.

Work Area	Location	Duration	Night-time Possession	Weekend Possession
Balbriggan	Balbriggan Viaduct	3 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Balbriggan	OBB57A	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Balbriggan	Balbriggan Traction Substation	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Gormanston	Gormanston Station	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Gormanston	OBB68	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Laytown	Laytown Viaduct	3 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Laytown	Laytown Station	36 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Laytown	OBB74A	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Drogheda	OBB78	1 month	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Minimum of two weekend day-time possessions. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.

Work Area	Location	Duration	Night-time Possession	Weekend Possession
Drogheda	OBB80	12 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Weekend day-time possessions for demolition and large lifts. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Drogheda	UBK01	24 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Weekend day-time possessions for demolition and large lifts. 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Drogheda	OBB81	3 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	Some works may occur over weekends, where: 57 (Saturday) / 40 (Sunday) Irish Rail Services affected.
Drogheda	Drogheda Station	6 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	No weekend possessions.
Drogheda	Depot and stabling roads	24 months	Any track work will be performed overnight between 01:00 and 05:00, with no effect on DART / Irish Rail services.	No weekend possessions.

Table 6-27 Construction Work Impacts on Railway

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Fairview depot	Fairview depot	Minor modifications to the depot including new cleaning facilities.	12 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Trackwork likely to be performed during night-time possessions.	Negative	Not significant	Temporary effects
Howth Junction	Howth Junction and Donaghmede Station	Platform extension, track works, station entrance and footbridge modifications.	24 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Weekend day-time possessions may be required for large lifts. Trackwork likely to be performed during night-time possessions.	Negative	Not significant	Short-term effects
Clongriffin	Clongriffin Station	Construction of new turnback on Platform 0 including retaining wall to east of tracks.	12 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Trackwork likely to be performed during night-time possessions.	Negative	Not significant	Temporary effects
Malahide	Malahide Turnback	Construction of a turnback on a widened embankment between the Strand Road underbridge (UBB29) and the Malahide Viaduct (UBB30).	18 months	Standard working hours 5.5 days / week. Some work will be performed overnight and in full weekend possessions.	Weekend day-time possessions may be required for enabling works. Trackwork likely to be performed during night-time possessions.	Negative	Slight effects	Short-term effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
		Construction of a new modular reinforced earth wall and earthworks slope on the west side of the existing embankment.						
Malahide	Malahide Viaduct	Addition of 3No. OHLE supports to viaduct.	3 months	Overnight or weekend track possessions.	Minimum of six weekend day-time possessions likely required along with regular night-time possessions.	Negative	Slight effects	Temporary effects
Donabate	XB001 Level Crossing	Level crossing to be closed.	1 month	Overnight or weekend track possessions.	Likely to be performed during night-time possessions.	Negative	Not significant	Temporary effects
Donabate	Traction Substation	Temporary Construction Compound to support line wide OHLE installation and construction of permanent substation.	36 months	Line-wide works in overnight/weekend track possessions, substation works will be standard working hours 5.5days / week.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects
Donabate	OBB32A	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Donabate	Donabate Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects
Donabate	OBB33A	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Donabate	OBB35	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Rogerstown	Rogerstown Viaduct	Addition of 2No. OHLE supports to viaduct abutments.	3 months	Overnight or weekend track possessions.	Minimum of four weekend day-time possessions likely required along with regular night-time possessions.	Negative	Slight effects	Temporary effects
Donabate	OBB38	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Rush and Lusk	Rush and Lusk Traction Substation	Temporary Construction Compound to support line wide OHLE installation and construction of permanent substation.	36 months	Line-wide works in overnight/weekend track possessions, substation works will be standard working hours 5.5days / week.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Rush and Lusk	OBB38A	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Rush and Lusk	OBB39	Track lowering.	1 month	Weekend track possessions.	Minimum of two weekend day-time possessions likely to be required.	Negative	Slight effects	Temporary effects
Donabate	OBB41	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Rush and Lusk	OBB44	Track lowering.	1 month	Weekend track possessions.	Minimum of two weekend day-time possessions likely to be required.	Negative	Slight effects	Temporary effects
Baldongan	OBB46	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Baldongan	OBB47	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Skerries	Skerries South Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Skerries	OBB49	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Skerries	Golf Links Road UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Skerries	Skerries Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects
Skerries	OBB51A	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Skerries	Skerries North Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Skerries	Barnageerah UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Skerries	OBB54	Parapet modifications to footbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Balbriggan	Skerries Road South UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Balbriggan	Skerries Road North UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Balbriggan	OBB55	Parapet modifications to road overbridge and track lowering.	1 month	Overnight and weekend track possessions.	Minimum of two weekend day-time possessions likely to be required. Parapet modification likely to be during night time possessions	Negative	Slight effects	Temporary effects
Balbriggan	Balbriggan Viaduct	Addition of 2No. OHLE supports to viaduct.	3 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Night-time possessions for large lifts and prep works.	Negative	Not significant	Temporary effects
Balbriggan	OBB57A	Parapet modifications to station footbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Balbriggan	Balbriggan Traction Substation	Temporary Construction Compound to support line wide OHLE installation and construction of permanent substation.	36 months	Line-wide works in overnight/weekend track possessions, substation works will be standard working hours 5.5days / week.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects
Gormanston	Drogheda Street UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Gormanston	Gormanston Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Gormanston	Station Road UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Gormanston	Gormanston Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Gormanston	OBB68	Parapet modifications to road overbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects
Laytown	Delany Cottages South UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Laytown	Delany Cottages North UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Laytown	Laytown Viaduct	Addition of 2No. OHLE supports to viaduct.	3 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Likely night-time possessions for delivering materials to southern pier.	Negative	Not significant	Temporary effects
Laytown	Laytown Station	Temporary Construction Compound to support line wide OHLE installation.	36 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Line-wide work likely to be performed during night-time or weekend possessions.	Negative	Slight effects	Short-term effects
Laytown	OBB74A	Parapet modifications to station footbridge.	1 month	Overnight or weekend track possessions.	Likely to be performed during night time possessions.	Negative	Not significant	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Laytown	The Grove UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Bettystown	Bettystown Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Bettystown	Draycott Lodge UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Drogheda	Colpe East UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Drogheda	OBB78	Parapet modifications to road overbridge and track lowering.	1 month	Overnight and weekend track possessions.	Minimum of two weekend day-time possessions likely to be required. Parapet modification likely to be during night time possessions	Negative	Slight effects	Temporary effects
Drogheda	Park Wood UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Drogheda	Weavers Way UTX	Utility under track crossing	3 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Drogheda	OBB80	Temporary Construction Compound to support line wide OHLE installation and reconstruction of overbridge.	12 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Weekend day-time possessions for demolition and large lifts. Night-time possessions for OHLE/track level works.	Negative	Slight effects	Temporary effects

Work area	Location	Works proposed	Duration	Working hours	Railway Impact	Quality of Effects:	Describing the Significance of effects:	Describing the Duration and Frequency of Effects:
Drogheda	UBK01	Dublin Road bridge reconstruction.	24 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Weekend day-time possessions for demolition and large lifts. Night-time possessions for access to track level works.	Negative	Slight effects	Short-term effects
Drogheda	OBB81	Station footbridge reconstruction.	3 months	Standard working hours 5.5 days / week and overnight or weekend track possessions.	Night time possessions for demolition and reinstatement.	Negative	Not significant	Temporary effects
Drogheda	Drogheda Traction Substation	Construction of permanent substation.	6 months	Standard working hours 5.5 days / week.	No impact. Offline.	Neutral	Imperceptible	Temporary effects
Drogheda	Drogheda Station	New Platform 4 on Navan Line.	6 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Any trackwork likely to be performed during night-time possessions.	Negative	Not significant	Temporary effects
Drogheda	Depot and stabling roads	Minor modifications to the depot including new cleaning facilities and stabling roads.	24 months	Standard working hours 5.5 days / week. Some track work will be performed overnight.	Any trackwork likely to be performed during night-time possessions.	Negative	Not significant	Short-term effects

Drogheda Freight Sidings

The Drogheda Freight Sidings will be impacted by the bridge works at Drogheda station. This railway line will need to be closed for intermittent periods leading up to the installation of a new bridge deck when closure may be required for a small number of weeks. The impact on rail services along the Drogheda Freight Sidings will be **negative, significant and temporary**. Meantime it is planned to retain as much functionality of the railway line as reasonably possible during the works, making use of passing lanes where safe to do so.

6.5.1.8.5 Construction Impact on Bus Network

The existing bus network may be affected by construction works taking place at the bridges listed. These routes are primarily impacted in Drogheda at the Dublin Road Bridge construction works, see Table 6-28.

Table 6-28 Future Bus Routes Affected by Bridge Modification Works

Zone	Structure Name	Road / Bridge	Number of Proposed Bus Routes
Zone A	No structural interventions within this zone	No structural interventions within this zone	No structural interventions within this zone
Zone B	OBB17A & OBQ0	Howth Junction and Donaghmede Footbridge	None
	UBB30 – Malahide Viaduct	Malahide Viaduct	None
Zone C	OBB32A	Donabate Bypass	None
	OBB33A	Donabate Footbridge	None
	OBB35	Beaverstown Golf Club	None
	OBB38	Rogerstown Lane	None
	OBB38A	Rush & Lusk Footbridge	None
	OBB39	Rush & Lusk Roadbridge	L85, X76
	OBB41	Kingstown / Public Road	None
	OBB44	Tyrrelstown / Public Road	None
	OBB46	Baldongan	None
	OBB47	Skerries Golf Club	None
	OBB49	Golf Links Road Skerries	None
	OBB51A	Skerries Footbridge	None
	OBB54	Ladies Stairs	None
	OBB55	County Bridge / Public Road	L85

Zone	Structure Name	Road / Bridge	Number of Proposed Bus Routes
	OBB57A	Balbriggan Footbridge	None
Zone D	OBB68	Irishtown / Public Road	None
	OBB74A	Laytown Footbridge	None
	OBB78	Colpe Bridge / Public Road	910, 912
Zone E	OBB80/80A/80B	McGraths Lane Drogheda	None
	OBB81	MacBride Station	None
	OBB81C	MacBride Station	None
	UBK01	Dublin Road Bridge	D4, D5, 101, 101X

Overall these impacts are considered **negative, slight and temporar**y at Drogheda as during total road closures bus routes D4, D5, 101 and 101X will be diverted and temporary bus stops will need to be used.

6.5.2 Potential Operational Impacts

6.5.2.1 Introduction

This section covers the operational effect of the scheme in place. The detailed analysis of various elements was presented in following sections.

6.5.2.2 Assessment Scenarios and Assumptions

6.5.2.2.1 Demand Scenarios/Assessment Years

The forecast demand scenarios assessed for the strategic modelling and the local area modelling were consistent with the assumptions for other major transport schemes in the GDA, namely the DART+ West, DART + South West and the Dublin BusConnects scheme.

- Opening Year – 2028; and
- Forecast Year – 2043 (opening + 15 years = design year).

The junction modelling was based on baseline data collected in 2023.

6.5.2.2.2 Supply Scenarios/Infrastructure and Service Assumptions

- **Do Nothing (DN)** – The Do-Nothing scenario is also known as the baseline and represents the existing situation of traffic and transport conditions. This scenario will not include any of the committed schemes including DART + Coastal North. In this study, no further analysis was carried out for DN scenario;
- **Do Minimum (DM)** – The Do Minimum scenario represents the likely traffic and transport conditions in the study area and includes any transportation schemes which will have taken place, have been approved or are planned for implementation **without** the proposed scheme (DART + Coastal North) in place, except for BEMU, which is considered to be in place

however has no material impact on the transport assessment in this chapter. This scenario also includes the improvements related to the BusConnects project; and

- **Do Something (DS)** – The Do Something scenario represents the likely traffic and transport conditions in the study area and includes any transportation schemes which will have taken place, have been approved or are planned for implementation **with** the proposed scheme (DART + Coastal North) in place. This scenario also includes the improvements related to the BusConnects project along with the impacts of changes to (as detailed in below sections) level crossing closure times. This scenario is referred as DS1 in the report.

Assessment Assumptions - Improvement of the Rail Service

Strategic infrastructure assumptions were consistent with the assumptions for other major transport schemes in the GDA, namely the DART + West, DART + South West and the Dublin BusConnects scheme. In particular:

- Metro North to Charlemont was included in all 2043 scenarios;
- All elements of BusConnects Dublin were included in all 2028 and 2043 scenarios;
- Metro South was excluded from all scenarios;
- DART + Tunnel Kildare Line to Northern Line was excluded from all scenarios; and
- Demand Management Measure assumptions were included in all scenarios, consistent with the assumptions on demand management included in the BusConnects EIAR:
    - Dublin City Parking Constraint;
    - M50 Demand Management Measures – Variable Speed Limits;
    - M50 Demand Management Measures – Multi-point tolling by 2043;
    - Implement demand management measures to address congestion issues on the radial national routes approaching the M50 motorway by 2043; and
    - Further demand management measures that ensure that a maximum 45% car commuter mode share is achieved by 2043.

The Do Minimum (excl. DART + Coastal North) assumptions were as follows:

- DART + West (Part Maynooth-Bray services are to the Connolly / Grand Canal Dock area only) is operational;
- DART + South West is operational;
- Today's Greater Dublin Area services; and
- DART+ TSS Scenario as shown in Image 6-56 below.

Image 6-56 Do Minimum Scenario Assumptions

The Do Something (incl. DART + Coastal North) assumptions (presented in Image 6-57 and Image 6-56 were as follows:

		Time Period	Mon-Fri				
Route Sector	O&D	Size	2pm-3pm	5am-7am	7am-8am	8am-9am	9am-10am
DART Coastal (Northern & SE Line)	Howth-Howth Junction & Donaghmede	4 EMU	5	6	6	6	5
	Howth Junction & Donaghmede-Howth	4 EMU	5	6	6	6	5
	Dundalk-Connolly	8X29000	1	2	2	2	1
	Connolly-Dundalk	8X29000	1	2	2	2	1
	Drogheda-Bray	8 EMU	2	3	3	3	2
	Bray-Drogheda	8 EMU	2	3	3	3	2
	Drogheda-Connolly	8 EMU	1	2	2	2	1
	Connolly-Drogheda	8 EMU	1	2	2	2	1
	Malahide-Greystones	8 EMU	2	2	2	2	2
	Greystones-Malahide	8 EMU	2	2	2	2	2
	Clongriffin-Bray	8 EMU	1	2	2	2	1
	Bray-Clongriffin	8 EMU	1	2	2	2	1
	Belfast LP - Connolly	*7 ICR*	*1*	*1*	*1*	*1*	*1*
	Connolly-Belfast LP	*7 ICR*	*1*	*1*	*1*	*1*	*1*
	Connolly-Rosslare	*4 ICR*	*1*	*1*	*1*	*1*	*1*
	Rosslare-Connolly	*4 ICR*	*1*	*1*	*1*	*1*	*1*
DART+ South West (full)	Hazelhatch and Celbridge-Grand Canal Dock	8 EMU	2	3	3	3	2
	Grand Canal Dock-Hazelhatch and Celbridge	8 EMU	2	3	3	3	2
	Hazelhatch and Celbridge-Spencer Dock	8 EMU	3	4	4	4	3
	Spencer Dock-Hazelhatch and Celbridge	8 EMU	3	4	4	4	3
	Heuston-Hazelhatch and Celbridge	8 EMU	3	4	4	4	3
	Hazelhatch and Celbridge-Heuston	8 EMU	3	4	4	4	3
	Fast Lines Hatch-Heuston		*10*	*12*	*12*	*12*	*10*
	Heuston-Fast Lines Hatch		*10*	*12*	*12*	*12*	*10*
DART+ West (excl. May-Bray)	Maynooth-Connolly	8 EMU	1	1	1	1	1
	Connolly-Maynooth	8 EMU	1	1	1	1	1
	Maynooth-Grand Canal Dock	8 EMU	1	2	2	2	1
	Grand Canal Dock-Maynooth	8 EMU	1	2	2	2	1
	Maynooth-Docklands	8 EMU	2	3	3	3	2
	Docklands-Maynooth	8 EMU	2	3	3	3	2
	M3 Parkway-Docklands	8 EMU	3	4	4	4	3
	Docklands-M3 Parkway	8 EMU	3	4	4	4	3
	Longford-Connolly	*7 ICR*	*0*	*1*	*1*	*1*	*0*
	Connolly-Longford	*7 ICR*	*0*	*1*	*1*	*1*	*0*
	Sligo-Connolly	*7 ICR*	*1*	*1*	*1*	*1*	*1*
	Connolly-Sligo	*7 ICR*	*1*	*1*	*1*	*1*	*1*

Image 6-57 Do Something Scenario Assumptions

Do Something Scenario assumptions include:

- DART + Coastal North only (excl. plans for DART + Coastal South) is complete;
- Trains south of Grand Canal Dock limited to 9tphpd per the DoMin;
- Bray to Greystones section works not complete – limited to 2 tphpd;
- DART + West services limited without Coastal South completion – Maynooth-Bray's termination in Con/GCD;
- Rosslare Europort service is retained;
- Howth branch service operated as a shuttle;
- Enterprise operated by ICR equivalent;
- Heuston fast lines will reduce in off peak with outer commuter frequency reduced; and
- Outer Heuston service per the previous defined scenario for the Programme Level.

Assessment Assumptions – Changes to Level Crossing Closure Times

There are four level crossings situated along the Howth Branch. They are as follows:

- Kilbarrack Level Crossing (Baldoyle Road) – Rail line across the Baldoyle Road/ Warrenhouse Road;
- Sutton Level Crossing – Rail line across Station Road, adjacent to Sutton Station;
- Cosh Level Crossing – Rail line across Lauder's Lane; and

- Claremont Level Crossing - Rail line across a Private Access Road.

For the purposes of this assessment it was assumed that during the AM peak hour Kilbarrack (Baldoyle Road) Level Crossing closes five times per hour and Sutton Level Crossing closes three times per hour with three trains per hour per direction passing through each one. Table 6-29 shows the closure times across the full one-hour period.

Table 6-29 Baseline Level Crossing Closure Times for 3TPH per direction

Baseline 3TPH per direction	Number of closures per hour	Total baseline closure time per hour	Minimum baseline closure time	Maximum baseline closure time	Assessed Timetable
Kilbarrack (Baldoyle Road) Level Crossing	5	00:14:31	00:01:41	00:04:35	00:02:54
Sutton Level Crossing	3	00:11:08	00:03:22	00:04:23	00:03:43

Under the 6TPH TSS1C scenario, it was assumed, for the purposes of the analysis, that the Howth Branch will run as a DART shuttle service. Six trains per hour per direction was assumed to pass through each of the level crossings, equating to a total of 12 trains passing per hour.

The proposed opening and closure times of the level crossing barriers are calculated based on outputs from a RailSys model. With six trains per direction, this in effect means a train departs each end station every 10 minutes. TSS1C will result in an increased number and duration of level crossing closures. This is presented in Table 6-30.

Table 6-30 Proposed Level Crossing Closure Times for 6TPH per direction.

Proposed 6TPH TSS1C	Number of Closures per hour	Total proposed closure time per hour	Minimum proposed closure time	Maximum proposed closure time	Assessed Timetable
Kilbarrack (Baldoyle Road) Level Crossing	6 or 12	00:12:50 to 00:30:50	00:02:08	00:05:08	00:04:50 6 times per hour
Sutton Level Crossing	6 or 12	00:13:06 to 00:31:30	00:02:11	00:05:11	00:02:11 6 times per hour

The baseline level crossing closure times, based on the modelled 3TPH per direction barrier timings and level crossing closures during the AM peak was assumed for the Do Nothing and Do Minimum scenarios. This was compared to the proposed worst-case Do Something scenario of 6 TPH per direction barrier timings and increased level crossing closures during the AM peak.

For more information on the assessment assumptions on increased level crossing closure times please refer to Appendix A6.1.

Assessment Assumptions - Permanent Loss of Parking Provision

There will be 10 car parking spaces removed on a permanent basis at Rusk and Lusk Station. There is currently capacity in the station car park as discussed in Section 6.6.2.2 or further discussion on car parking loss.

6.5.2.3 Operational Impact of Improvement of the Rail Service

6.5.2.3.1 Study Area

Image 6-58 presents the extent of the DART+ Coastal North scheme through the various geographic zones (A, B, C, D and E) as presented in Table 6-5. To access the mode shares, areas within a 5km buffer alongside the DART + Coastal North line were used. Furthermore, the area along the DART+ Coastal North line was divided by the R139 and reports on mode shares along the rail corridor to the north and south of the R139. This was carried out to know the impact of the scheme in urban and rural areas. Zones where any portion of the area is within 5km of the DART line are assessed as part of the study area.

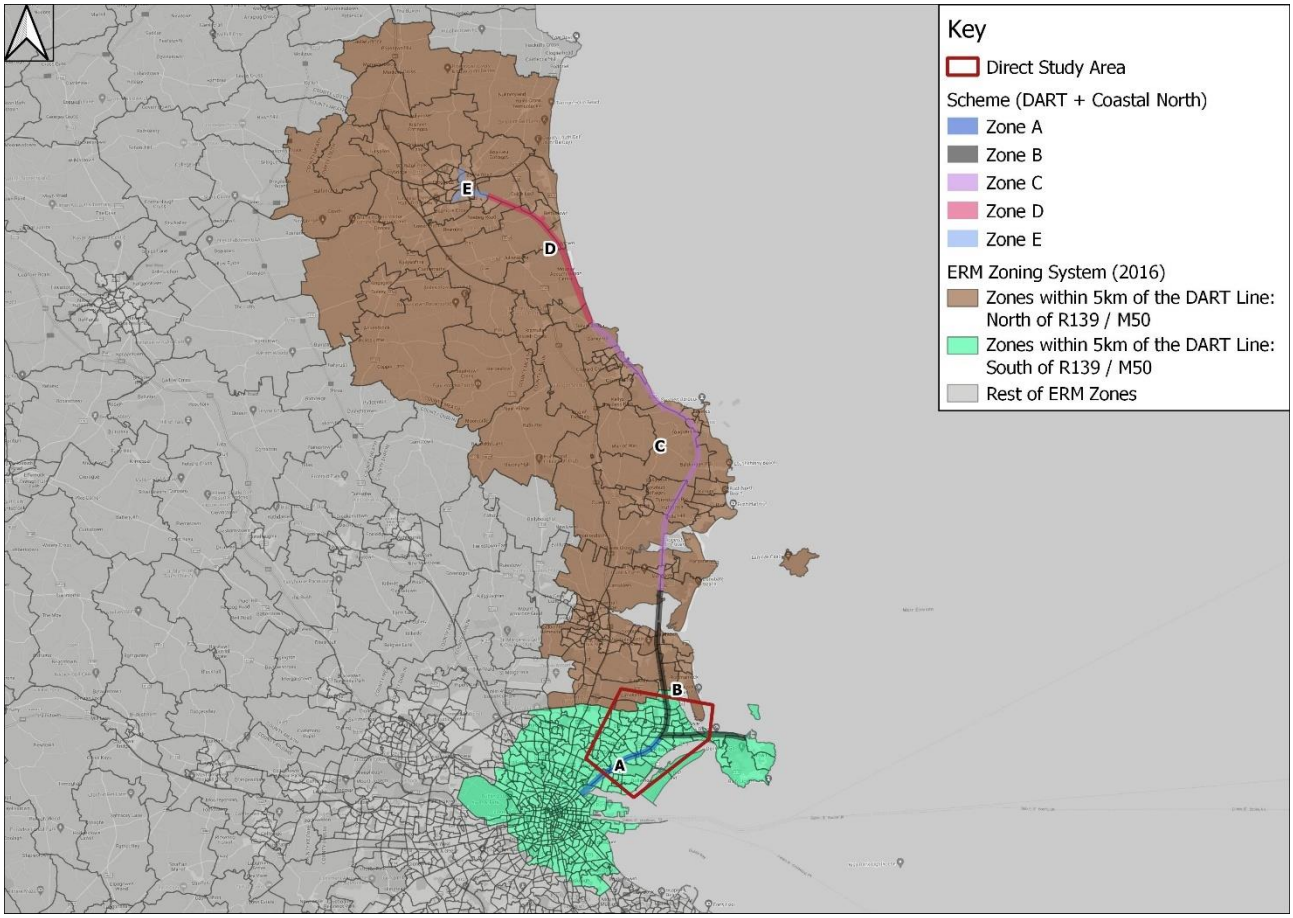


Image 6-58 DART + Coastal North scheme extent

6.5.2.3.2 Strategic Modelling Outputs

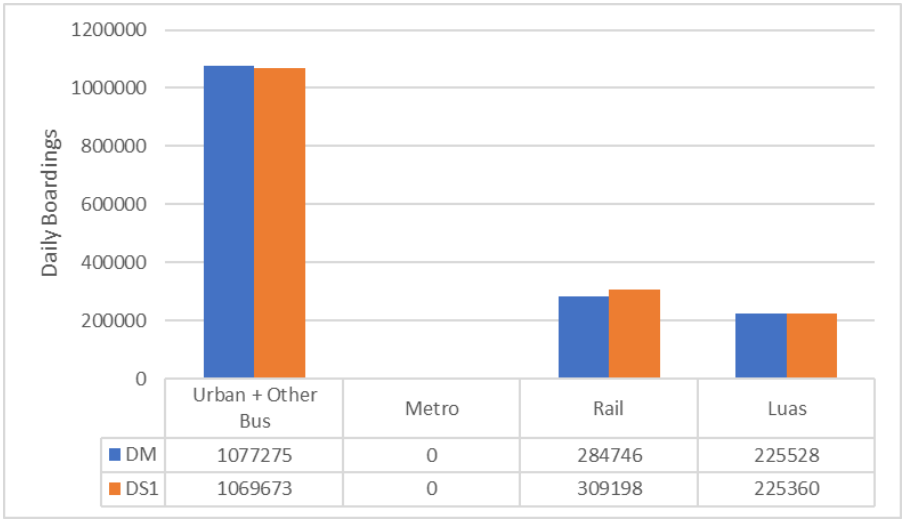
The ERM was used to provide estimates in terms of:

- the potential mode shift to rail transport; and
- the potential re-routing of traffic and impact on network performance.

Impact on Mode Choice

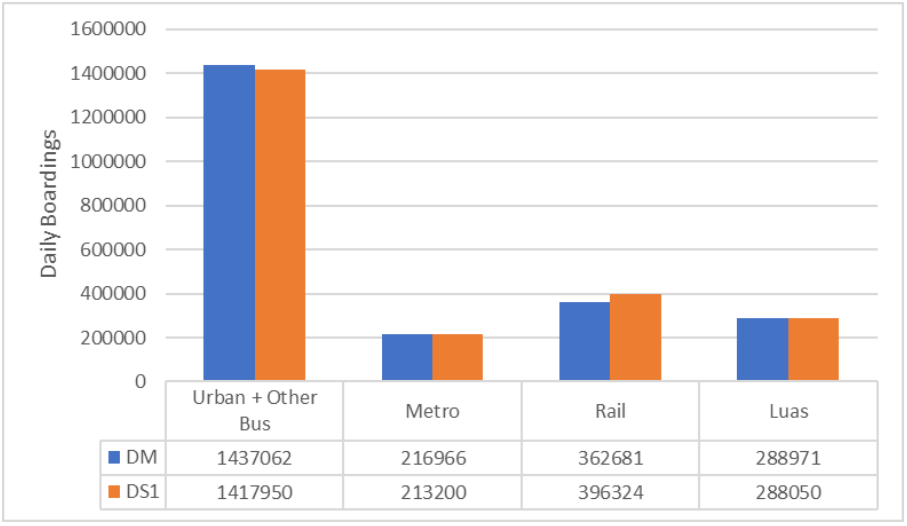
Based on Image 6-59 and Image 6-60 the Proposed Development will enable an increase in passenger numbers due to the increase in capacity and frequency of services on the rail network.

The total boardings show a significant shift towards heavy rail with an increase in the region of 24,500 and 33,700 passenger boardings per day for 2028 and 2043 respectively. As a benchmark DART + West reported 24,700 and 31,000 passenger boardings per day for 2028 and 2043 respectively.



	Urban + Other Bus	Metro	Rail	Luas
DM	1077275	0	284746	225528
DS1	1069673	0	309198	225360

Image 6-59 Daily Boardings (2028)



	Urban + Other Bus	Metro	Rail	Luas
DM	1437062	216966	362681	288971
DS1	1417950	213200	396324	288050

Image 6-60 Daily Boardings (2043)

Table 6-31 to Table 6-34 presents the various mode share comparisons between DM and DS. Public transport mode share increases in the Do Something scenario compared to the Do Minimum scenario in both 2028 and 2043. The most significant change is evident within the 5 km buffer north of the M50 / R139. This area traditionally has a higher car mode share due to the absence of frequent public transport modes and the impact of increased rail frequencies in this area is therefore more pronounced.

In overall ERM zones, daily public transport demand increases by 18,800 in 2028 and 15,800 in 2043 due to the implementation of the DART + Coastal North project. There is a reduction in car demand of 2,400 in 2028 and 4,300 in 2043.

Table 6-31 Mode share: All ERM Zones (2028 and 2043)

Year	Trips - All Zones Total	Road	PT	Walk	Cycle	Total
2028	DM	8439123	2564982	2843393	510442	14357940
	DS1	8436681	2583774	2837314	508374	14366143
	Difference	-2442	18791	-6079	-2068	8203
2043	DM	9036037	3547825	3363156	671773	16618791
	DS1	9031771	3563655	3359125	670066	16624617
	Difference	-4266	15830	-4031	-1707	5826

Table 6-32 Mode share: South of R139 (2028 and 2043)

Year	Trips - South of R139	Road	PT	Walk	Cycle	Total
2028	DM	1367251	1146246	936582	225506	3675585
	DS1	1367021	1151769	935655	224315	3678760
	Difference	-230	5523	-927	-1191	3175
2043	DM	1254044	1487767	1155766	302083	4199660
	DS1	1253650	1492426	1154526	300994	4201596
	Difference	-394	4659	-1240	-1089	1936

Table 6-33 Mode share: North of R139 (2028 and 2043)

Year	Trips - North of R139	Road	PT	Walk	Cycle	Total
2028	DM	808250	140717	202801	21997	1173765
	DS1	806525	151019	199093	21499	1178136
	Difference	-1725	10302	-3708	-498	4371
2043	DM	916048	237884	224011	28608	1406551
	DS1	914209	247168	220979	28106	1410462
	Difference	-1838	9284	-3033	-502	3911

Table 6-34 All zones within 5km buffer (2028 and 2043)

Year	Trips - All buffer	Road	PT	Walk	Cycle	Total

2028	DM	2175500	1286963	1139384	247503	4849350
	DS1	2173545	1302788	1134749	245814	4856896
	Difference	-1955	15825	-4635	-1689	7546
2043	DM	2170092	1725651	1379777	330691	5606211
	DS1	2167860	1739595	1375505	329100	5612058
	Difference	-2232	13943	-4273	-1591	5847

The scheme is an important component to achieve the objectives of the overall DART+ programme as reported in the business case. The effect on traffic and transportation from mode choice is therefore a **positive, moderate, medium-term effect**.

Impact on Route Choice and Overall Network Performance

A comparison is provided of the road traffic assignment between the Do Minimum and Do Something scenarios for the entire model based on the ERM for 2028 and 2043 respectively. These network wide effects on road network operations are relevant for both private car and bus modes.

From the traffic assignments we can see that decreased road-based traffic demand is expected along key strategic north-south corridors within the study area (refer to Image 6-56, Image 6-57 and Image 6-58).

The resulting relief at key congestion points will release bottlenecks elsewhere. This localised relief will lead to the M1 and M50 becoming attractive for strategic traffic movements, leading to small increases in traffic along the M1 and M50 along certain northbound sections as presented in Image 6-61 for the 2028 AM scenario only. A more in-depth analysis has shown the highest increases to be:

- Section 1: A 5% increase along the M1 northbound between the M1 & R125 interchange (Junction 3) and the M1 & R132 interchange (Junction 4) in the 2028 AM peak hour; and
- Section 2: A 7% increase along the M1 northbound between the M1 & R132 interchange (Junction 4) and the M1 & R132 interchange (Junction 5) in the 2028 AM peak hour.

The change in the Volume over Capacity Ratio (V/C) along these two sections are:

- Section 1: An increase from 38% in the Do Minimum Scenario to 40% in the Do Something scenario; and
- Section 2: An increase from 45% in the Do Minimum Scenario to 49% in the Do Something scenario.

Both sections will continue to operate below 80% capacity. Traffic will mostly decrease along the remaining motorways in the 2028 PM peak hour and the 2043 AM and PM peak hours, by around 1% to 4%.

The impact on the national road network will be **neutral, slight and medium term**.

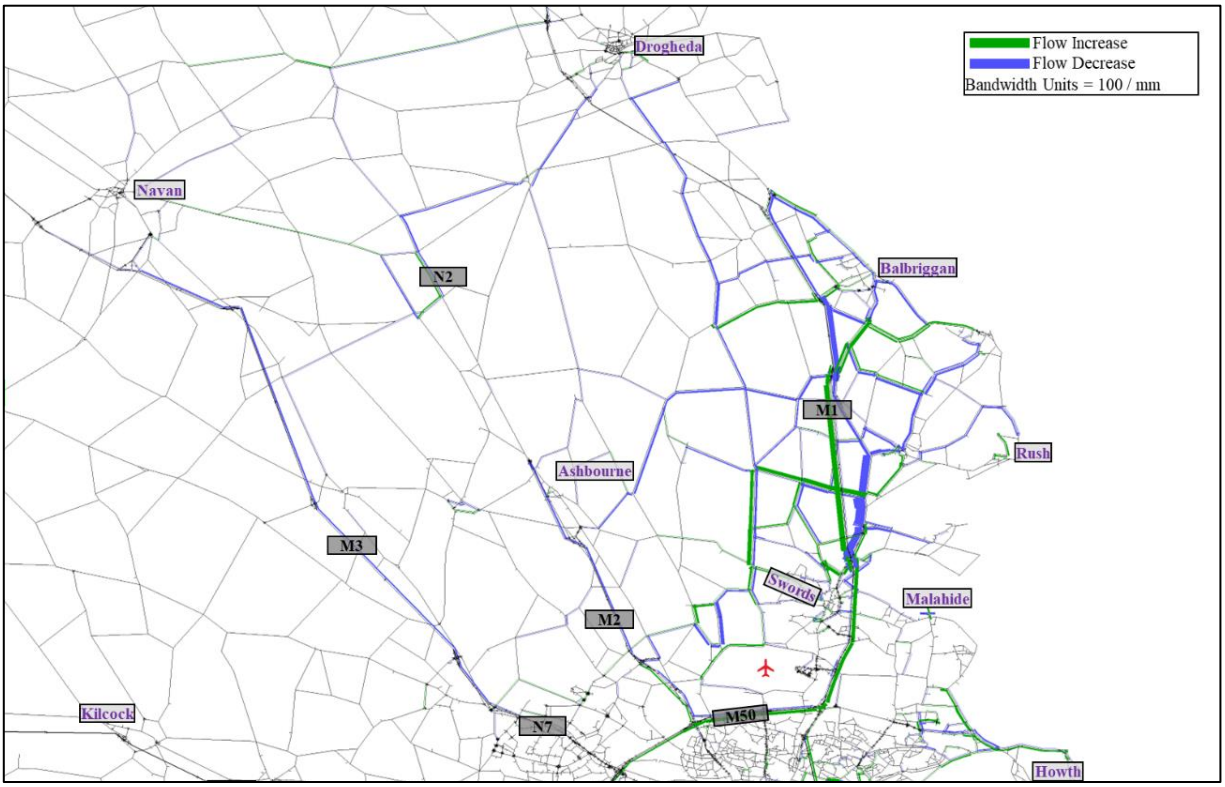


Image 6-61 Actual Flow Difference Plot (ERM) – 2028 AM (DS1 vs DM)

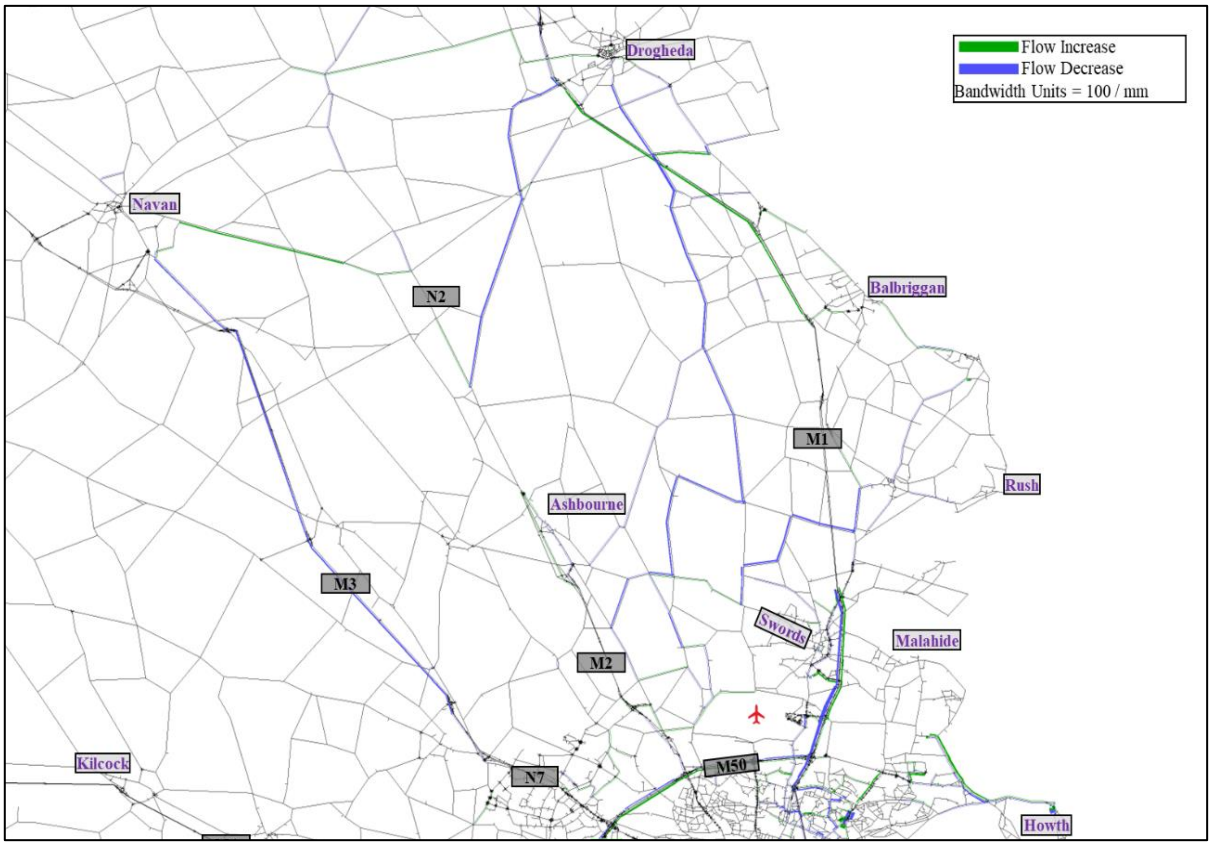


Image 6-62 Actual Flow Difference Plot (ERM) – 2028 PM (DS1 vs DM)

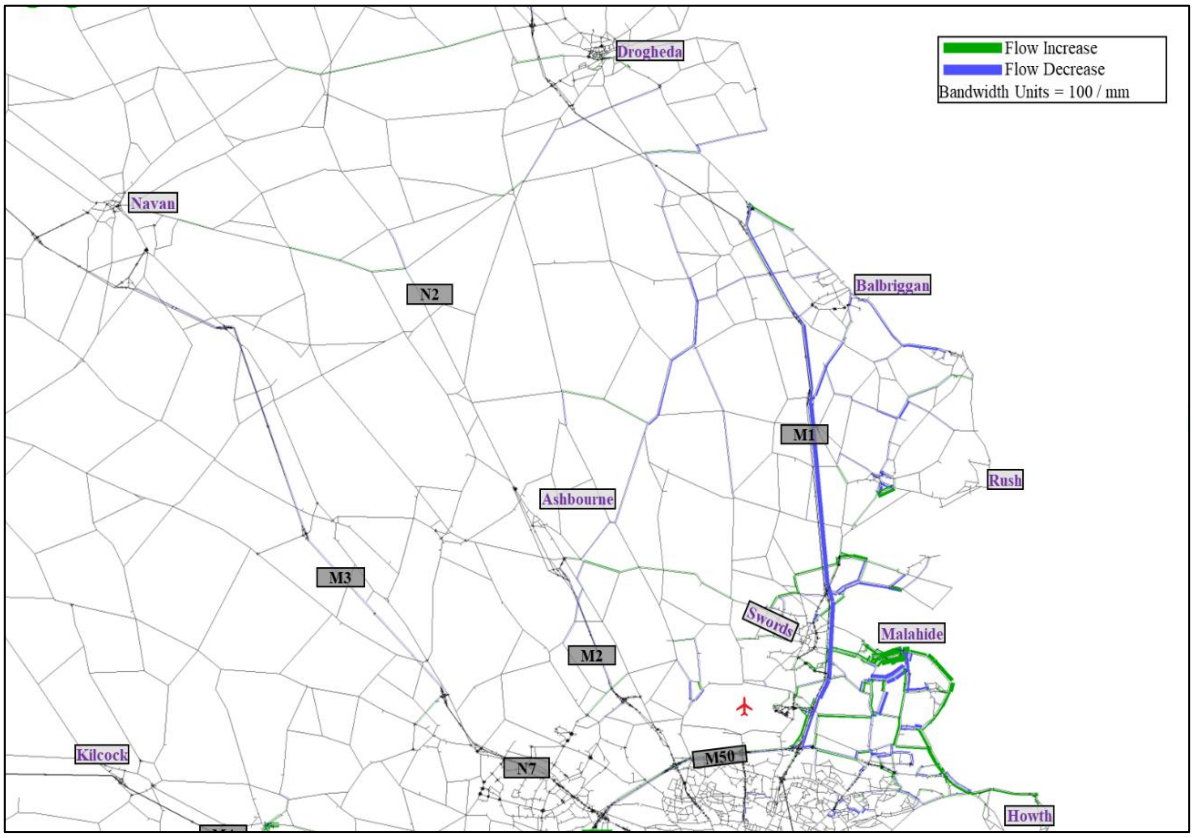


Image 6-63 Actual Flow Difference Plot (ERM) – 2043 AM (DS1 vs DM)

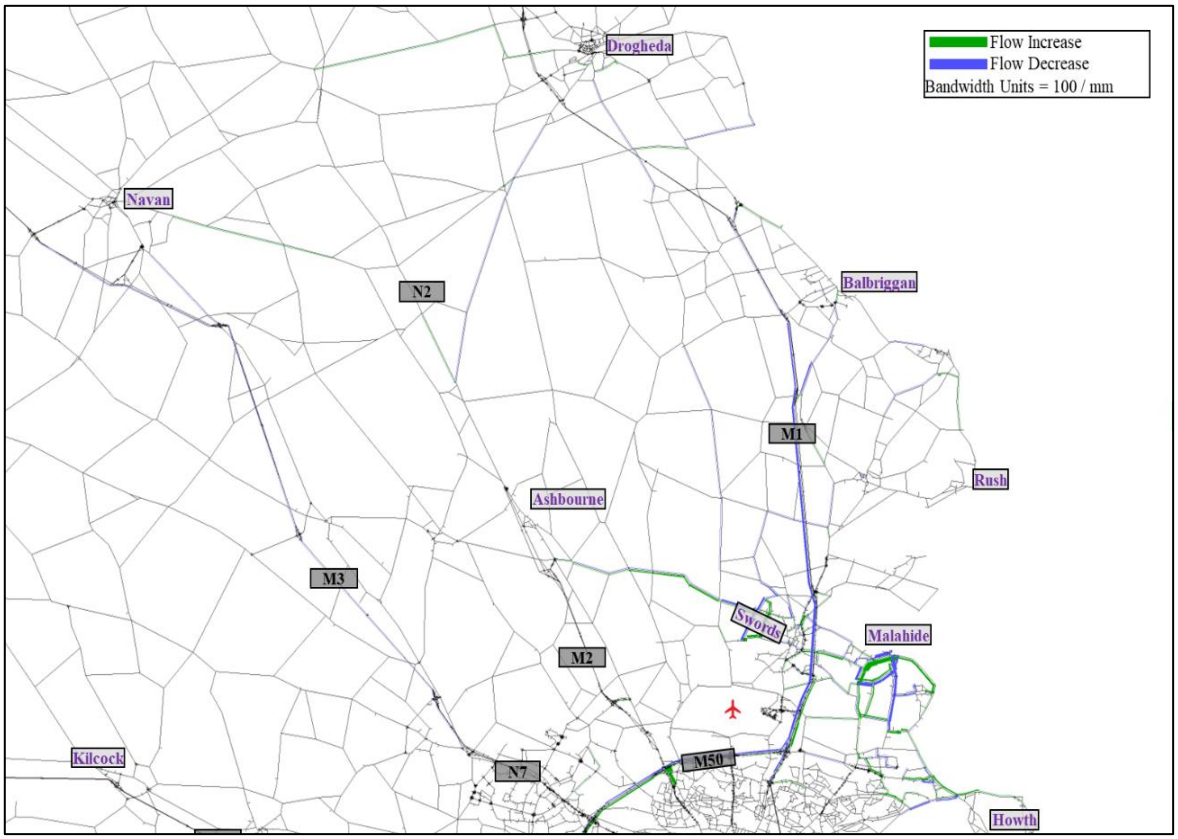


Image 6-64 Actual Flow Difference Plot (ERM) – 2043 PM (DS1 vs DM)

A more in-depth analysis was carried out using the DLAM for the direct study area, which was focused on the area surrounding the proposed increased level crossing closure times and this is discussed in Section 6.5.2.4.

The comparison of Total Demand, Queuing, Travel Time, Travel Distance and Average Speed between Do Minimum and Do Something for the entire model based on the ERM for 2028 and 2043 respectively is provided. These network wide effects on road network operations are relevant for both private car and bus modes.

There are marginal changes in queueing, travel time, travel distance and travel speeds in the ERM study area as shown in Table 6-35 and Table 6-36.

Table 6-35 Operational Impact 2028 (ERM) - AM and PM Peak Hour

Indicator	AM Peak			PM Peak		
	Do Minimum	Do Something 1	% Change	Do Minimum	Do Something 1	% Change
Queuing (pcu/hr)	28,463	28,372	-0.3%	25,659	25,597	-0.2%
Travel Time (pcu/hr)	95,395	95,021	-0.4%	93,838	93,606	-0.2%
Travel Distance (pcu/km)	3,168,912	3,161,672	-0.2%	3,095,348	3,087,808	-0.2%
Average Speed (kph)	33.2	33.3	0.3%	33.0	33.0	0.0%

Table 6-36 Operational Impact 2043 (ERM) - AM and PM Peak Hour

Indicator	AM Peak			PM Peak		
	Do Minimum	Do Something 1	% Change	Do Minimum	Do Something 1	% Change
Queuing (pcu/hr)	29,002	28,977	-0.1%	26,273	26,287	0.1%
Travel Time (pcu/hr)	100,860	100,632	-0.2%	99,945	99,488	-0.5%
Travel Distance (pcu/km)	3,262,121	3,255,628	-0.2%	3,163,902	3,157,699	-0.2%
Average Speed (kph)	32.3	32.4	0.3%	31.7	31.7	0.0%

It is clear therefore, that the effect on traffic and transportation in respect of route choice and overall ERM network performance is a **neutral, imperceptible, medium-term effect**.

6.5.2.4 Operational Impact of Increased Level Crossing Closure Times

6.5.2.4.1 Study Area

There are five level crossings throughout the length of the Proposed Development. A level crossing south of Donabate is used for farm access and will be closed. The four remaining level crossings are utilised by the public for vehicle, public transport, pedestrian and cycle access along the Howth Branch are subject to additional analyses.

This section covers the impact of Proposed Development on the road network within the direct study area of the model based on DLAM. The direct study area was established based on various test runs to assess the impact of increased level crossing closures. Only the junctions located within this study area were identified for further analysis.

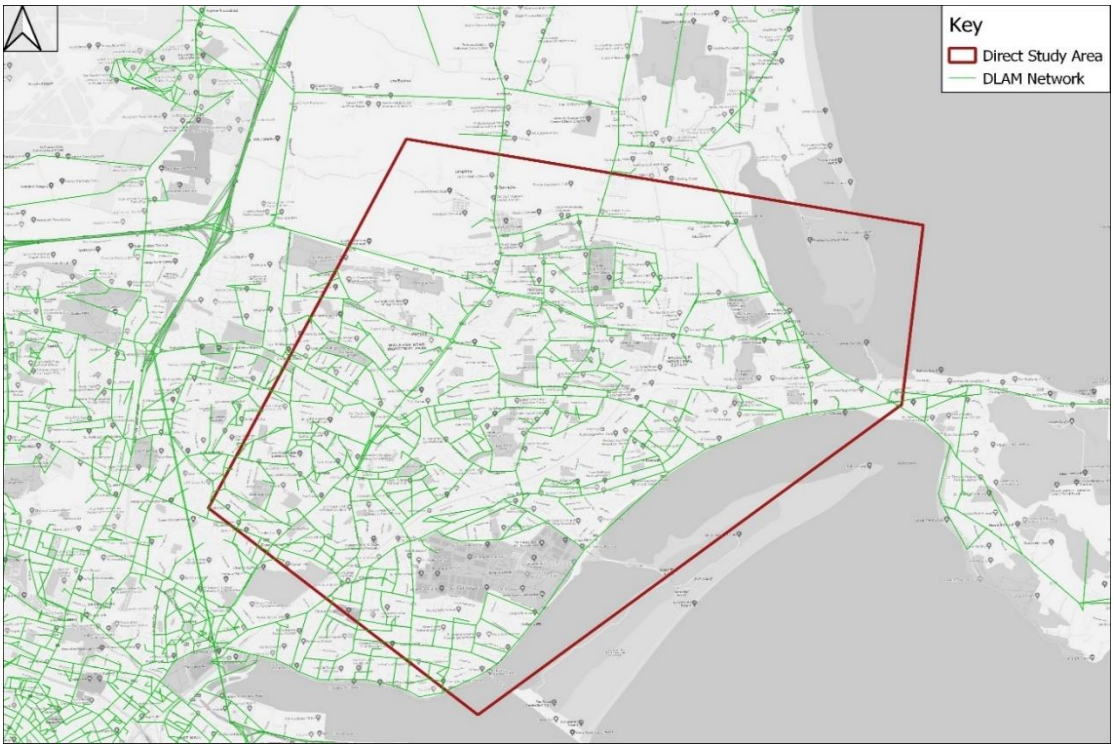


Image 6-65 Direct Study Area from DLAM

6.5.2.4.2 Local Area Modelling Outputs

The DLAM was used to provide estimates in terms of the potential re-routing of traffic and impact on overall network and junction performance.

This traffic assessment shows the degree to which car demand at the level crossings might change in future due to changes in trip distribution, mode choice or route choice as a result of the improvement of the rail service and the increased level crossing closure times. For this local assessment no changes in car demand as a result of demand management or climate action plan measures were assumed.

Impact on Overall Network Performance

For this impact assessment the study area covered the entire local area based on the DLAM for both 2028 and 2043 respectively – i.e., across the Greater Dublin Area. This study area is considered appropriate as in future, it would allow comparison of similar outputs against other potential schemes or scenarios, for example the proposed DART + Coastal South project. The network wide effects on road network operations are relevant for both private car and bus modes.

The Do Minimum scenario along with two sub-scenarios for the Do Something scenario are presented in Table 6-37 and

Table 6-38, as follows:

- Do Something 1A (originally DS1): DART + Coastal North with Increased Level Crossing Closure Times (Proposed Development); and
- Do Something 1B: DART + Coastal North without Increased Level Crossing Closure Times (Theoretical test to illustrate the impact of increased Level Crossing Closure Times).

Table 6-37 Operational Impact 2028 (DLAM) - AM and PM Peak Hour

Indicator	AM Peak				PM Peak			
	DM	DS1 [A]	% Change [A]	DS 1 [B]	DM	DS 1 [A]	% Change [A]	DS 1 [B]
Total Demand	194,365	194,108	-0.1%	194,108	178,904	178,751	-0.1%	178,750
Queuing (pcu/hr)	22,083	22,155	0.3%	22,121	21,434	21,407	-0.1%	21,422
Travel Time (pcu/hr)	69,789	69,569	-0.3%	69,548	67,244	67,161	-0.1%	67,142
Travel Distance (pcu/km)	2,078,184	2,076,678	-0.1%	2,076,803	1,999,471	1,998,336	-0.1%	1,998,234
Average Speed (kph)	29.8	29.9	0.3%	29.9	29.7	29.8	0.3%	29.8

Table 6-38 Operational Impact 2043 (DLAM) - AM and PM Peak Hour

Indicator	AM Peak				PM Peak			
	DM	DS1 [A]	% Change [A]	DS 1 [B]	DM	DS 1 [A]	% Change [A]	DS 1 [B]
Total Demand	196,514	196,147	-0.2%	196,147	181,765	181,509	-0.1%	181,509
Queuing (pcu/hr)	22,741	22,710	-0.1%	22,625	22,842	22,774	-0.3%	22,909
Travel Time (pcu/hr)	73,668	73,160	-0.7%	72,992	73,991	73,732	-0.4%	73,520
Travel Distance (pcu/km)	2,196,341	2,191,240	-0.2%	2,190,933	2,104,642	2,099,981	-0.2%	2,099,838
Average Speed (kph)	29.8	30.0	0.7%	30.0	28.4	28.5	0.4%	28.6

The outputs show marginal changes for all the indicators for both the AM and PM peak of 2028 and 2043. The overall impact of increased level crossing closures is shown to be marginal (Do Something 1B vs Do Something 1A). The effect on traffic and transportation therefore of route choice and local area network performance is a **neutral, imperceptible, medium-term effect**.

Impact on Journey Time (JT)

Journey times along various routes were compared between the Do Something and Do Minimum scenarios. Journey time data was extracted from the DLAM for the 2028 and 2043 forecast scenarios. The journey time routes were selected based on potential alternative routes or corridors which carry larger traffic volumes within the direct study area (as shown in Image 6-66).

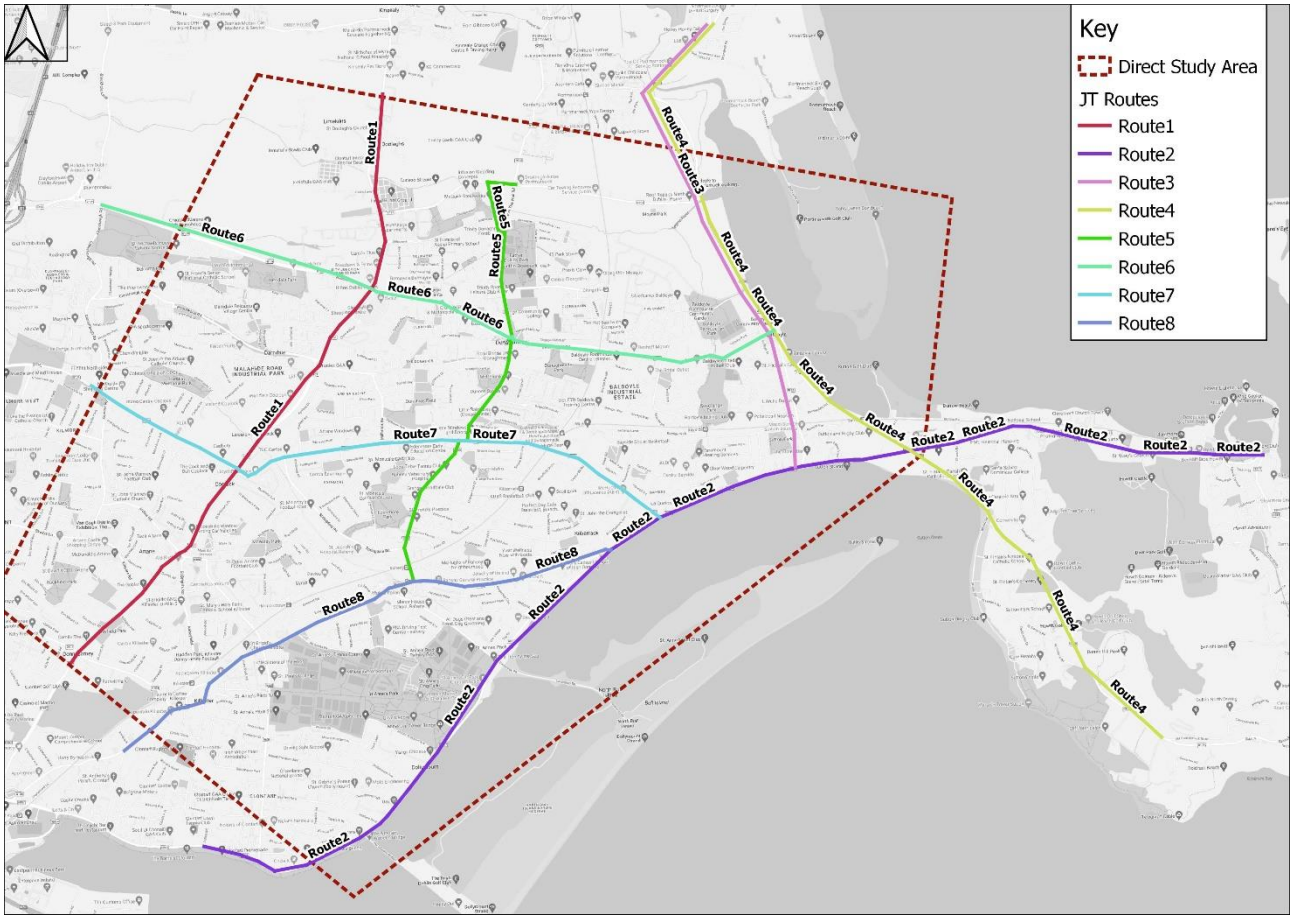


Image 6-66 Journey Time Route

Table 6-39 and Table 6-40 present the comparison of journey times between DS 1 (as explained in section 6.5.2.2.2) and DM for 2028 and 2043 respectively. The changes between DS 1 and DM are slight with the highest increase being 7% to 8% for Route 3 and 4 NB in the 2028 AM peak – an approximate additional 30 to 50 seconds. Other routes show slight decreases in journey time.

Table 6-39 Operational Impact – Journey Time 2028 (DLAM)

Route	Direction	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
Route1	NB	17:04	17:07	0%	30:53	30:41	-1%
	SB	24:20	24:09	-1%	17:19	17:33	1%
Route2	EB	17:34	17:27	-1%	22:50	22:44	0%
	WB	21:21	21:48	2%	17:37	17:34	0%
Route3	NB	06:14	06:41	7%	08:42	08:38	-1%
	SB	10:46	10:08	-6%	07:03	07:20	4%
Route4	NB	11:27	12:19	8%	13:42	13:49	1%
	SB	13:40	13:24	-2%	11:05	11:32	4%
Route5	NB	11:05	11:20	2%	17:51	17:33	-2%
	SB	15:34	15:08	-3%	11:55	11:59	1%
Route6	EB	11:16	11:12	-1%	12:05	11:35	-4%
	WB	21:15	21:18	0%	19:16	19:04	-1%
Route7	EB	13:37	13:44	1%	21:08	21:01	-1%
	WB	17:22	17:33	1%	16:56	16:46	-1%
Route8	NB	11:19	11:17	0%	16:52	16:44	-1%
	SB	15:29	15:45	2%	12:10	12:07	0%

Table 6-40 Operational Impact – Journey Time 2043 (DLAM)

Route	Direction	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
Route1	NB	18:20	18:34	1%	27:09	27:02	0%
	SB	22:24	22:40	1%	18:40	18:45	0%
Route2	EB	16:36	16:33	0%	21:55	21:58	0%
	WB	19:07	19:21	1%	17:06	17:01	0%
Route3	NB	06:43	07:12	7%	08:14	08:29	3%
	SB	11:45	10:54	-7%	08:27	08:49	4%
Route4	NB	11:23	12:10	7%	12:54	13:26	4%
	SB	13:40	13:13	-3%	12:34	13:10	5%
Route5	NB	11:33	11:47	2%	19:37	19:26	-1%
	SB	15:33	15:27	-1%	13:20	13:29	1%
Route6	EB	11:39	11:37	0%	15:04	14:40	-3%
	WB	20:36	20:20	-1%	20:22	20:16	0%
Route7	EB	13:11	13:14	0%	15:16	15:17	0%

Route	Direction	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	WB	16:03	16:13	1%	16:40	16:43	0%
Route8	NB	10:31	10:30	0%	16:35	16:31	0%
	SB	13:04	13:10	1%	11:03	10:58	-1%

The effect on traffic and transportation in respect of journey time therefore is a **neutral, imperceptible, medium-term effect**.

Impact on Route Choice and Junction Performance

A comparison is provided of the road traffic assignment between Do Minimum and Do Something scenarios for the DLAM for 2028 and 2043 respectively. These network wide effects on road network operations are relevant for both private car and bus modes.

From the traffic assignments we can see that there is a mixture of increases and decreases in traffic along Baldoyle Road, Coast Road, Dublin Road and Grange Road. These differences are minimal and due to rerouting of traffic within the local area network as a result of the Proposed Development which includes the increased DART + Coastal North service frequency and the associated increased level crossing closure times. Image 6-67 Image 6-70 present the various flow comparisons between DM and DS1 for 2028 and 2043.

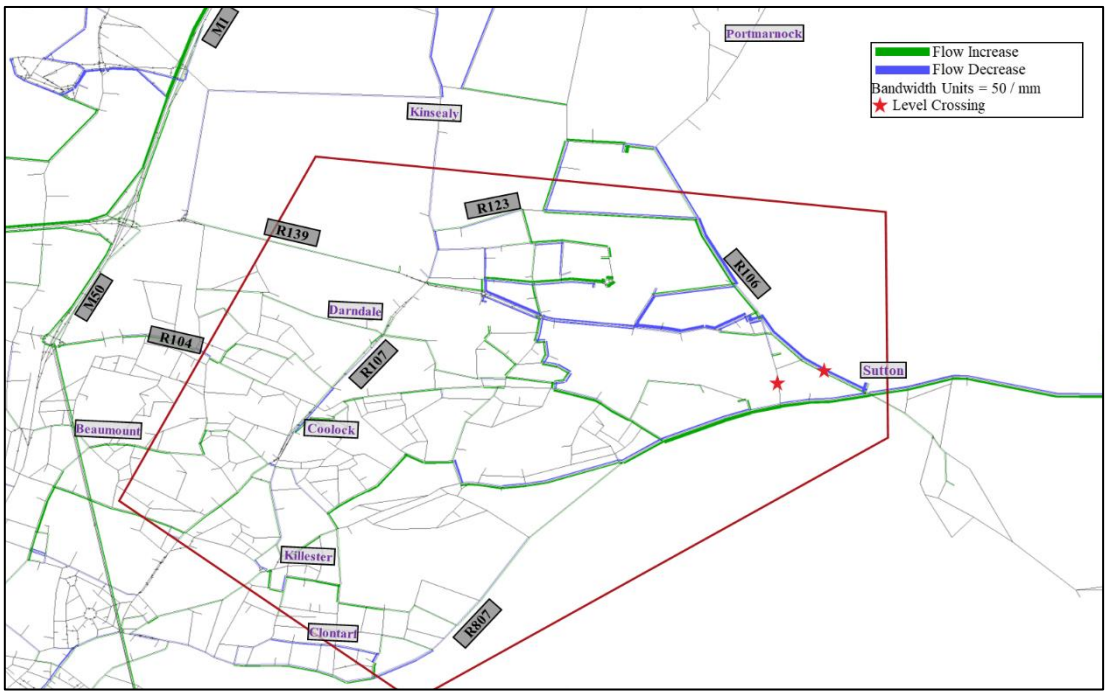


Image 6-67 Actual Flow Difference Plot (DLAM) – 2028 AM (DS1 vs DM)

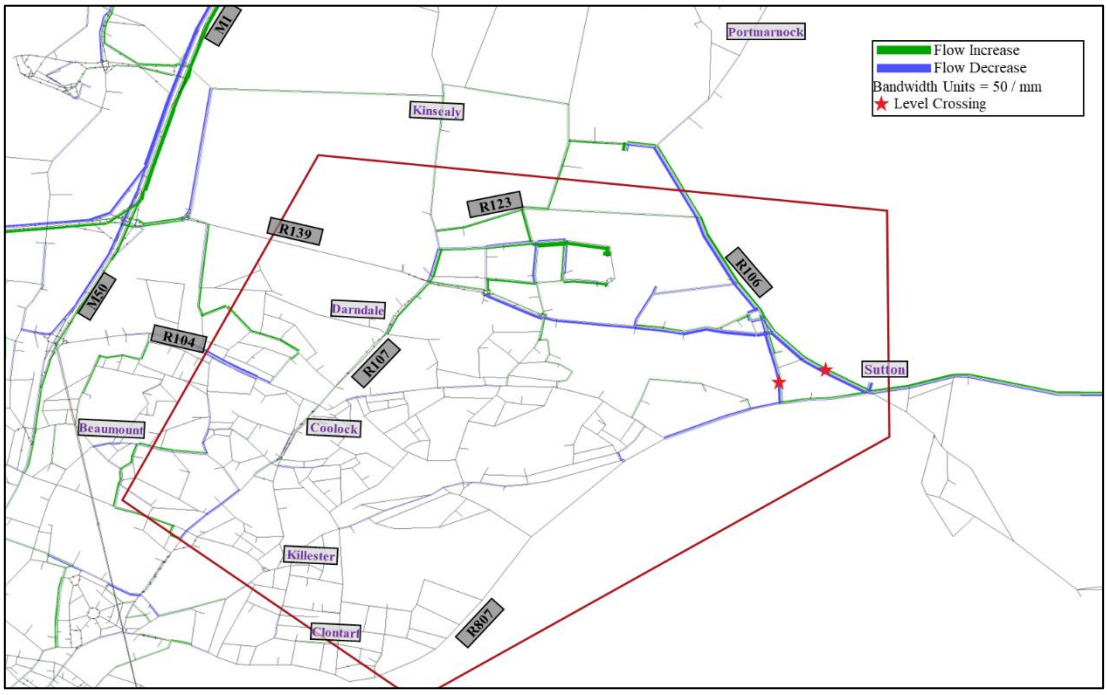


Image 6-68 Actual Flow Difference Plot (DLAM) – 2028 PM (DS1 vs DM)

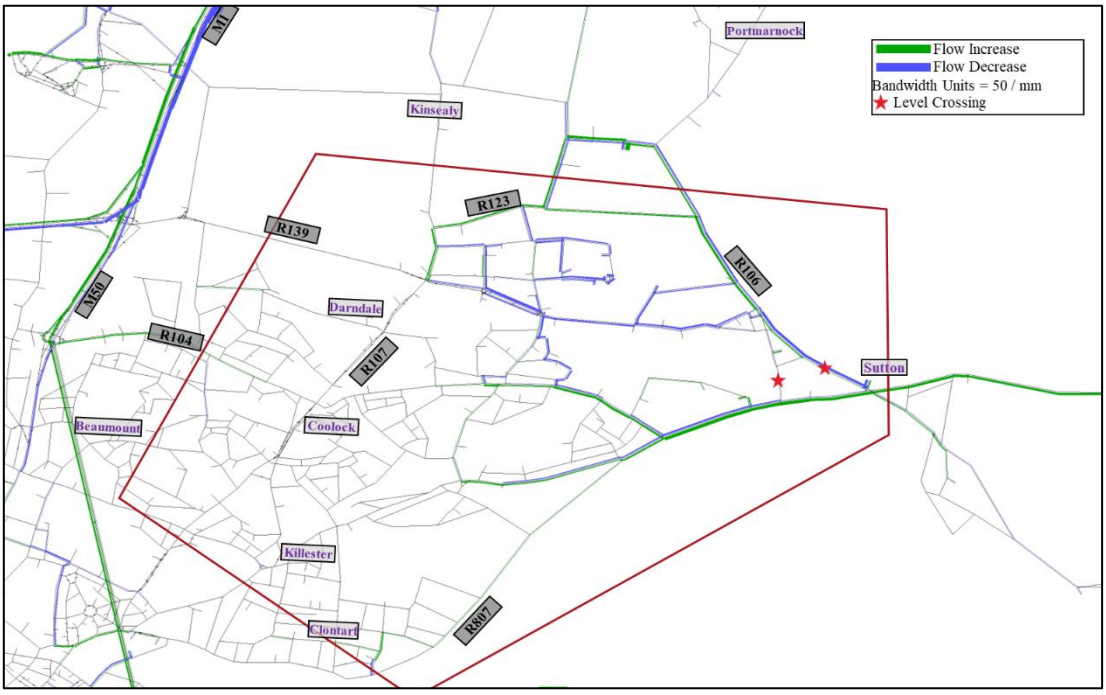


Image 6-69 Actual Flow Difference Plot (DLAM) – 2043 AM (DS1 vs DM)

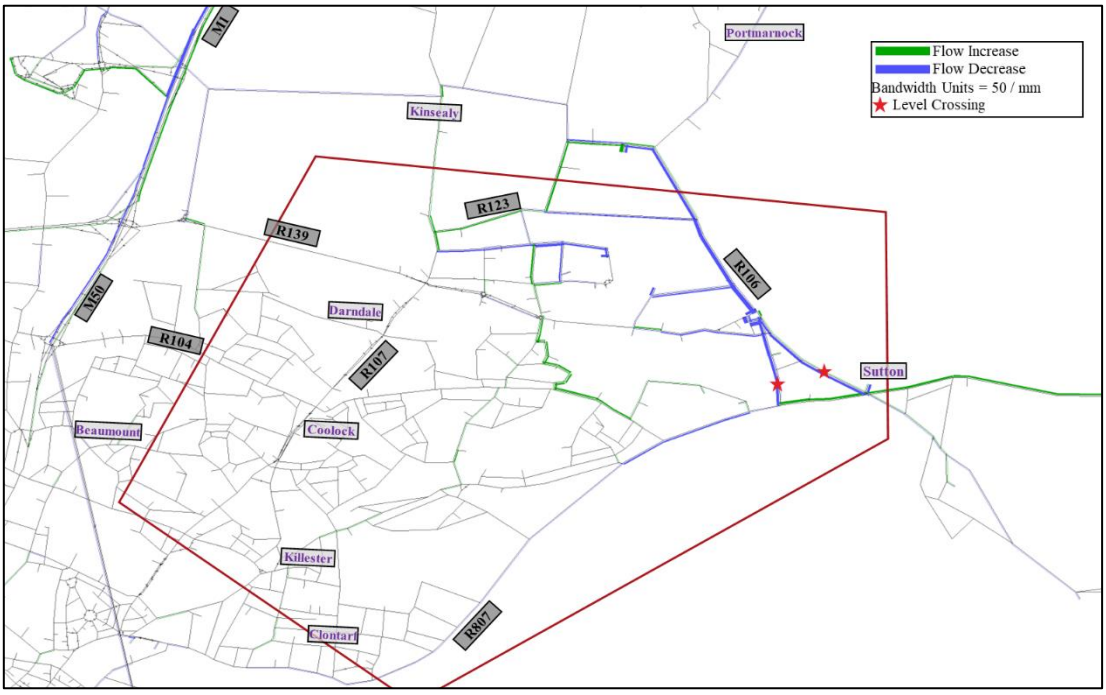


Image 6-70 Actual Flow Difference Plot (DLAM) – 2043 PM (DS1 vs DM)

In order to select junctions to be monitored for any potential impact on performance due to changes in route choice, the following criteria were established:

a. Level of Service (LoS) – The various categories based on delay and its LoS are presented in Table 6-41. Junctions with LoS of E and F either in the Do Minimum (DS0) or Do Something (DS1) were considered locations where significant impacts may be experienced.
b. Volume to Capacity (VoC) – Junctions which are unstable either in Do Minimum or Do Something were selected. The junctions having VoC greater than 85% were considered as unstable locations where significant impacts may be experienced.
c. Link Flow Changes – Junctions with traffic flow changes higher than +/-10% for approaching arms in Do Something were considered locations where significant impacts may be experienced.

Table 6-41 Delay and Level of Service (LoS) Criteria

LoS	Signalised Intersection	Unsignalised Intersection	Clarification
A	≤10 sec	≤10 sec	Low delay and good progression
B	10-20 sec	10-15 sec	Generally good progression
C	20-35 sec	15-25 sec	Fair progression
D	35-55 sec	25-35 sec	Congestion becoming noticeable
E	55-80 sec	35-50 sec	Poor progression
F	>80 sec	>50 sec	Oversaturated

Based on the above set of criteria, the junctions listed in Table 6-42 and Table 6-43 were selected within the direct study area, to be monitored for any potential significant impacts. The change in traffic flow (passenger car unit - PCU) at these junctions before and after the implementation of the Proposed Development is also provided in Table 6-42 and Table 6-43 for 2028 and 2043 respectively.

Table 6-42 Operational Impact 2028 – Traffic Flow Change

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
R107(Malahide Road) / R139	R107 North	716	716	0%	915	931	2%
	R139 East	775	776	0%	494	491	0%
	R107 South	726	729	0%	875	867	-1%
	R139 West	1137	1141	0%	1323	1325	0%
	Overall	**3353**	**3361**	**0%**	**3608**	**3615**	**0%**
R139 / R809 (Grange Road)	R139 East	611	598	-2%	662	634	-4%
	R809 South	821	838	2%	951	951	0%
	R139 West	1304	1268	-3%	922	930	1%
	The Hole in the Wall Road	485	483	0%	406	413	2%
	Overall	**3221**	**3187**	**-1%**	**2940**	**2928**	**0%**
R809 / R104 (Kilbarrack Road)	R104 East	411	407	-1%	132	133	1%
	R104 West	605	613	1%	700	700	0%
	Grange Road	490	495	1%	516	519	1%
	Overall	**1506**	**1514**	**1%**	**1349**	**1352**	**0%**
R104 / R809 (Raheny Road)	R104 East	840	853	2%	587	585	0%
	Raheny road	650	659	1%	649	650	0%
	R104 West	149	148	-1%	281	277	-1%
	Overall	**1639**	**1660**	**1%**	**1517**	**1512**	**0%**
R809 / Springdale Road	Raheny Road North	646	648	0%	498	499	0%
	Raheny Road South	618	628	1%	617	613	-1%
	Springdale Road	38	37	-1%	69	67	-2%
	Overall	**1302**	**1313**	**1%**	**1183**	**1179**	**0%**
R809 / R105 (Howth Road)	R105 East	450	476	6%	294	288	-2%
	Main Street	20	20	1%	57	56	-2%
	R105 West	647	643	-1%	799	794	-1%
	Station Road	588	566	-4%	505	506	0%
	Overall	**1705**	**1704**	**0%**	**1656**	**1644**	**-1%**
	R105 Dublin Road	1042	1094	5%	710	700	-1%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
R104 / R105 (Howth Road)	R105 Howth Road	596	578	-3%	863	862	0%
	R104 Kilbarrack Road	227	223	-2%	328	327	0%
	Overall	**1866**	**1896**	**2%**	**1901**	**1889**	**-1%**
R106 (Station Road) / R105	Howth Road	374	403	8%	380	368	-3%
	Greenfield Road	329	337	2%	317	314	-1%
	R105 Dublin Road	341	340	0%	387	396	2%
	R106 Station Road	517	513	-1%	506	517	2%
	Overall	**1561**	**1592**	**2%**	**1590**	**1595**	**0%**
R809 / R105 (Dublin Road)	R105 Dublin Road East	580	621	7%	461	452	-2%
	R105 Dublin Road West	773	763	-1%	1205	1190	-1%
	Baldoyle Road	581	578	0%	435	443	2%
	Overall	**1934**	**1962**	**1%**	**2100**	**2086**	**-1%**
R106 / Sutton Level Crossing	R106 Station Road	360	371	3%	538	497	-8%
	R106 Strand Road	584	551	-6%	456	474	4%
	Overall	**944**	**922**	**-2%**	**994**	**971**	**-2%**
R809 / Baldoyle Level Crossing	Baldoyle Road	407	402	-1%	766	737	-4%
	Warrenhouse Road	581	578	0%	435	443	2%
	Overall	**988**	**980**	**-1%**	**1200**	**1180**	**-2%**
R106 / The Mall	R106 Strand Road South	359	370	3%	541	500	-8%
	The Mall	0	0		0	0	
	R106 Strand Road North	578	545	-6%	450	468	4%
	Overall	**937**	**915**	**-2%**	**991**	**968**	**-2%**
R809 / Dublin Street	Main Street	523	515	-2%	454	466	3%
	The Mall	0	15		176	148	-16%
	Warrenhouse Road	450	450	0%	658	623	-5%
	Dublin Street	0	0		0	0	
	Overall	**974**	**980**	**1%**	**1287**	**1237**	**-4%**
Verbena Avenue / R104	Verbena Avenue	98	104	6%	62	59	-5%
	R104 Kilbarrack Road East	151	170	13%	185	189	2%
	R104 Kilbarrack Road West	262	259	-1%	323	326	1%
	Overall	**510**	**533**	**4%**	**570**	**574**	**1%**
R104 / Thornville Road	R104 Kilbarrack Road West	401	395	-1%	439	442	1%
	R104 Kilbarrack Road East	179	205	15%	122	122	0%
	Thornville Road	138	140	2%	126	125	-1%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	Overall	**717**	**740**	**3%**	**687**	**689**	**0%**
Kilbarrack Parade / R104	Kilbarrack Parade	80	82	2%	69	68	-1%
	R104 Kilbarrack Road East	312	341	9%	218	217	0%
	R104 Kilbarrack Road West	500	492	-2%	515	519	1%
	Overall	**893**	**915**	**2%**	**802**	**804**	**0%**
St. Donagh's Park / R104	St. Donagh's Park	492	476	-3%	314	322	3%
	R104 Kilbarrack Road East	383	413	8%	282	281	0%
	R104 Kilbarrack Road West	193	191	-1%	315	309	-2%
	Overall	**1068**	**1081**	**1%**	**911**	**912**	**0%**
R104 / Swan's Nest Avenue	R104 Kilbarrack Road East	488	483	-1%	204	205	1%
	Swan's Nest Avenue	17	16	-3%	26	22	-17%
	R104 Kilbarrack Road West	176	175	-1%	290	289	-1%
	Overall	**681**	**674**	**-1%**	**520**	**515**	**-1%**
St. Donagh's Road / St. Donagh's Park	St. Donagh's Park	80	105	33%	192	188	-2%
	St. Donagh's Road West	0	0		0	0	
	St. Donagh's Road East	492	476	-3%	314	322	3%
	Overall	**572**	**582**	**2%**	**506**	**510**	**1%**
Grange Road / St. Donagh's Road	Grange Road North	730	725	-1%	721	725	0%
	St. Donagh's Road	20	33	64%	9	9	-2%
	Grange Road South	654	655	0%	715	724	1%
	Overall	**1404**	**1413**	**1%**	**1445**	**1458**	**1%**
Longfield Road / R139	Longfield Road	288	250	-13%	59	60	2%
	R139 Grange Road East	443	438	-1%	367	336	-8%
	Grange Rise	35	34	-2%	397	393	-1%
	R139 Grange Road West	707	688	-3%	461	465	1%
	Overall	**1473**	**1410**	**-4%**	**1283**	**1254**	**-2%**
R106 Coast Road / Red Arches Road	R106 Coast Road South	446	465	4%	867	834	-4%
	Red Arches Road	118	131	11%	207	197	-5%
	R106 Coast Road North	840	806	-4%	504	530	5%
	Overall	**1403**	**1401**	**0%**	**1577**	**1561**	**-1%**
R106 Coast Road / R123	R106 Coast Road South	436	458	5%	903	869	-4%
	R123 Moyne Road	118	105	-11%	71	78	11%
	R106 Coast Road North	719	699	-3%	407	425	4%
	Overall	**1273**	**1262**	**-1%**	**1381**	**1372**	**-1%**

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
R123 / R124	R123 East	163	177	8%	285	281	-2%
	R123 West	399	401	1%	349	360	3%
	R124 North / Drumnigh Road	517	505	-2%	235	246	5%
	Overall	**1079**	**1083**	**0%**	**869**	**887**	**2%**
Park Avenue / Marsfield Avenue	Marsfield	140	162	15%	111	96	-13%
	Marsfield Avenue	30	29	-5%	120	171	43%
	Park Avenue	202	191	-5%	83	98	18%
	Overall	**373**	**382**	**2%**	**314**	**365**	**16%**
R808 / Kincora Road	R808 North	0	0		0	0	0%
	Kincora Road East	233	222	-5%	47	46	-1%
	R808 South	0	0		0	0	
	Kincora Road West	50	48	-3%	138	143	4%
	Overall	**282**	**270**	**-4%**	**185**	**190**	**3%**
Seafield Rd East / Seapark Rd	Seafield Road East (East)	203	212	4%	56	56	0%
	Seapark Road	57	57	-1%	68	69	2%
	Seafield Road East (West)	34	34	0%	57	53	-7%
	Overall	**294**	**303**	**3%**	**180**	**178**	**-1%**
R808 / Mount Prospect Avenue	R808 North	90	90	-1%	203	204	0%
	Mount Prospect Avenue	236	248	5%	80	81	1%
	R808 South	13	13	0%	118	117	0%
	Overall	**339**	**351**	**4%**	**401**	**402**	**0%**
R105 / R808	R105 East	842	842	0%	613	607	-1%
	R808 South	94	95	2%	153	152	-1%
	R105 West	580	580	0%	719	719	0%
	R808 North	417	430	3%	381	382	0%
	Overall	**1932**	**1947**	**1%**	**1866**	**1860**	**0%**
R105 / The Meadows	R105 East	887	888	0%	616	611	-1%
	The Meadows	30	30	-1%	76	73	-3%
	R105 West	682	681	0%	835	833	0%
	Overall	**1599**	**1598**	**0%**	**1527**	**1518**	**-1%**
R107 / R103	R107 North	628	639	2%	519	523	1%
	R103 East	219	222	1%	141	140	0%
	R107 South	663	666	0%	737	720	-2%
	R103 West	227	227	0%	142	142	0%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	Overall	**1737**	**1754**	**1%**	**1537**	**1525**	**-1%**
R107 / R808	R107 South	650	657	1%	648	641	-1%
	R808 West	316	312	-1%	414	414	0%
	R107 North	587	586	0%	558	565	1%
	R808 East	313	314	0%	354	353	0%
	Overall	**1866**	**1869**	**0%**	**1974**	**1974**	**0%**
Watermill Road / Watermill Drive	Watermill Road East	33	30	-10%	17	16	-5%
	Watermill Drive	84	83	-1%	127	123	-3%
	Watermill Road West	115	114	-2%	69	69	0%
	Overall	**232**	**227**	**-2%**	**213**	**208**	**-2%**
Watermill Road / All Saints Road	Watermill Road East	37	34	-6%	17	16	-5%
	All Saints Road	0	0		0	0	
	Watermill Road West	5	4	-10%	8	8	0%
	Overall	**41**	**39**	**-6%**	**24**	**24**	**-3%**
R105 / R807	R105 Howth Road North	994	1021	3%	691	694	0%
	R807 Howth Road	462	458	-1%	802	802	0%
	R105 South	198	183	-8%	225	214	-5%
	Overall	**1655**	**1663**	**0%**	**1718**	**1709**	**0%**
Ennel Avenue /St. Brendan's Park	Ennel Avenue North	34	30	-11%	35	34	-2%
	Ennel Avenue South	15	15	1%	39	35	-10%
	St. Brendan's Park	0	0	0%	1	1	-2%
	Overall	**49**	**45**	**-7%**	**74**	**70**	**-6%**
Moatfield Road / Ennel Avenue	Moatfield Road	24	23	-3%	25	23	-8%
	Ennel Avenue	14	14	1%	39	35	-10%
	Moatfield Avenue	10	7	-29%	10	11	12%
	Overall	**48**	**44**	**-7%**	**74**	**69**	**-6%**
Moatfield Road / Moatfield Avenue	Moatfield Road South	10	10	2%	35	31	-11%
	Moatfield Avenue	1	1	-9%	6	5	-2%
	Moatfield Road North	151	160	6%	106	101	-5%
	Overall	**162**	**171**	**6%**	**146**	**137**	**-6%**
R104 / Moatfield Road	R104 North	451	461	2%	376	370	-2%
	Moatfield Road	11	11	0%	40	37	-9%
	R104 South	284	282	-1%	481	479	0%
	Overall	**746**	**755**	**1%**	**898**	**886**	**-1%**

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
R107 / R104	R107 North	540	526	-2%	709	714	1%
	R104 East	312	314	0%	286	285	0%
	R107 South	830	839	1%	841	838	0%
	R104 West	270	268	-1%	288	286	-1%
	Overall	**1952**	**1947**	**0%**	**2124**	**2123**	**0%**
R107 / Greencastle Road	R107 North	635	628	-1%	671	679	1%
	Tonlegee	9	9	0%	84	83	-1%
	R107 South	610	618	1%	637	634	0%
	Greencastle Road	167	166	0%	285	284	0%
	Overall	**1420**	**1422**	**0%**	**1676**	**1680**	**0%**
Kilmore Road / R104	R104 East	911	924	1%	1047	1037	-1%
	Kilmore Road	483	483	0%	539	537	0%
	R104 West	542	530	-2%	186	163	-12%
	Overall	**1935**	**1937**	**0%**	**1772**	**1737**	**-2%**
R107 / Priorswood Road	R107 North	737	743	1%	943	958	2%
	Blunden Drive	516	522	1%	295	293	-1%
	R107 South	460	471	2%	851	848	0%
	Priorswood Drive	144	141	-2%	176	174	-1%
	Overall	**1857**	**1877**	**1%**	**2265**	**2274**	**0%**
Ardara Avenue / Kilfenora Drive	Grangemore Road	32	31	-2%	29	30	3%
	Ascaill Ard an Raha	1	14	13%	9	14	48%
	Kilfenora Drive	7	6	-1%	123	122	-1%
	Overall	**39**	**52**	**31%**	**161**	**166**	**3%**
Grangemore Road / Grangemore Crescent	Grangemore Road East	0	0	0%	0	0	
	Grangemore Road West	8	21	163%	133	136	2%
	Grangemore Crescent	32	31	-2%	29	30	3%
	Overall	**39**	**52**	**31%**	**161**	**166**	**3%**
Grange Road / Grangemore Road	Grange Road North	1398	1383	-1%	1080	1092	1%
	Grange Road South	821	838	2%	930	930	0%
	Grangemore Road	0	0		55	55	-2%
	Overall	**2219**	**2220**	**0%**	**2066**	**2077**	**1%**
Main Street / Belmayne Avenue	Belmayne Avenue North	187	175	-7%	4	4	0%
	Main Street East	191	181	-5%	75	97	30%
	Belmayne Avenue South	302	325	8%	474	468	-1%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	Main Street West	363	365	1%	133	133	0%
	Overall	**1043**	**1046**	**0%**	**685**	**701**	**2%**
Main Street / Hole in the Wall Road	Main Street East	284	273	-4%	280	288	3%
	Hole in the Wall Road South	315	333	6%	365	368	1%
	Main Street West	192	214	11%	125	126	0%
	Hole in the Wall Road North	251	250	-1%	140	146	4%
	Overall	**1042**	**1070**	**3%**	**910**	**928**	**2%**
Baldoyle Road / Burrowfield Road	Burrowfield Road	10	10	5%	6	6	-2%
	Baldoyle Road South	407	402	-1%	766	737	-4%
	Warrenhouse Road	587	584	0%	440	449	2%
	Overall	**1004**	**997**	**-1%**	**1212**	**1192**	**-2%**
R139 / Main Street	Main Street South	555	576	4%	657	649	-1%
	R139	60	56	-7%	215	185	-14%
	Main Street North	784	778	-1%	564	589	4%
	Overall	**1399**	**1410**	**1%**	**1436**	**1424**	**-1%**

Table 6-43 Operational Impact 2043 – Traffic Flow Change

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
R107 (Malahide Road) / R139	R107 North	751	764	2%	846	848	0%
	R139 East	760	756	-1%	507	506	0%
	R107 South	623	625	0%	667	667	0%
	R139 West	1011	1007	0%	1274	1278	0%
	Overall	**3145**	**3151**	**0%**	**3294**	**3299**	**0%**
R139 / R809 (Grange Road)	R139 East	589	570	-3%	497	493	-1%
	R809 South	741	749	1%	804	814	1%
	R139 West	1086	1050	-3%	857	859	0%
	The Hole in the Wall Road	342	341	0%	404	409	1%
	Overall	**2758**	**2709**	**-2%**	**2563**	**2575**	**0%**
R809 / R104 (Kilbarrack Road)	R104 East	251	265	5%	142	146	3%
	R104 West	581	579	0%	664	665	0%
	Grange Road	422	424	1%	424	429	1%
	Overall	**1253**	**1268**	**1%**	**1230**	**1240**	**1%**

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
R104 / R809 (Raheny Road)	R104 East	658	674	2%	550	554	1%
	Raheny Road	536	542	1%	575	577	0%
	R104 West	221	219	-1%	308	312	1%
	Overall	**1415**	**1435**	**1%**	**1433**	**1443**	**1%**
R809 / Springdale Road	Raheny Road North	555	553	0%	474	484	2%
	Raheny Road south	448	456	2%	525	527	0%
	Springdale Road	34	32	-4%	48	49	2%
	Overall	**1037**	**1041**	**0%**	**1047**	**1060**	**1%**
R809 / R105 (Howth Road)	R105 East	325	341	5%	246	244	-1%
	Main Street	46	46	0%	82	82	-1%
	R105 West	479	476	-1%	665	666	0%
	Station Road	557	551	-1%	489	498	2%
	Overall	**1407**	**1414**	**1%**	**1483**	**1490**	**0%**
R104 / R105 (Howth Road)	R105 Dublin Road	847	894	6%	691	675	-2%
	R105 Howth Road	515	499	-3%	824	822	0%
	R104 Kilbarrack Road	196	185	-6%	289	291	1%
	Overall	**1559**	**1579**	**1%**	**1804**	**1789**	**-1%**
R106 (Station Road) / R105	Howth Road	307	340	11%	272	269	-1%
	Greenfield Road	291	301	4%	284	277	-2%
	R105 Dublin Road	256	257	0%	346	373	8%
	R106 Station Road	449	441	-2%	439	439	0%
	Overall	**1303**	**1339**	**3%**	**1342**	**1358**	**1%**
R809 / R105 (Dublin Road)	R105 Dublin Road East	479	526	10%	380	377	-1%
	R105 Dublin Road West	672	655	-2%	1091	1090	0%
	Baldoyle Road	397	394	-1%	444	439	-1%
	Overall	**1547**	**1576**	**2%**	**1916**	**1906**	**0%**
R106 / Sutton Level Crossing	R106 Station Road	322	331	3%	436	401	-8%
	R106 Strand Road	521	488	-6%	413	423	2%
	Overall	842	819	-3%	849	824	-3%
R809 / Baldoyle Level Crossing	Baldoyle Road	373	369	-1%	685	654	-5%
	Warrenhouse Road	397	394	-1%	444	439	-1%
	Overall	**770**	**763**	**-1%**	**1130**	**1093**	**-3%**
R106 / The Mall	R106 Strand Road South	325	336	3%	441	407	-8%
	The Mall	0	0		0	0	

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	R106 Strand Road North	516	483	-6%	409	418	2%
	Overall	**842**	**819**	**-3%**	**850**	**826**	**-3%**
R809 / Dublin Street	Main Street	261	260	0%	351	344	-2%
	The Mall	0	0		145	136	-7%
	Warrenhouse Road	413	415	0%	586	546	-7%
	Dublin Street	89	84	-5%	112	115	3%
	Overall	**763**	**759**	**-1%**	**1193**	**1140**	**-4%**
Verbena Avenue / R104	Verbena Ave	63	67	6%	64	63	-2%
	R104 Kilbarrack Road East	97	119	22%	122	125	3%
	R104 Kilbarrack Road West	222	212	-4%	297	314	6%
	Overall	**382**	**398**	**4%**	**482**	**501**	**4%**
R104 / Thornville Road	R104 Kilbarrack Road West	314	302	-4%	390	408	5%
	R104 Kilbarrack Road East	113	139	23%	102	106	4%
	Thornville Road	101	102	1%	90	91	1%
	Overall	**528**	**543**	**3%**	**582**	**605**	**4%**
Kilbarrack Parade / R104	Kilbarrack Parade	49	49	0%	44	46	5%
	R104 Kilbarrack Road East	213	239	13%	166	173	4%
	R104 Kilbarrack Rd West	379	367	-3%	449	467	4%
	Overall	**641**	**656**	**2%**	**659**	**687**	**4%**
St Donagh's Pk/R104	St. Donagh's Pk	355	337	-5%	316	333	5%
	R104 Kilbarrack Road East	257	284	11%	207	217	5%
	R104 Kilbarrack Road West	140	134	-4%	224	226	1%
	Overall	**752**	**755**	**0%**	**747**	**775**	**4%**
R104 / Swan's Nest Avenue	R104 Kilbarrack Road East	301	313	4%	199	203	2%
	Swan's Nest Ave	11	10	-6%	20	17	-15%
	R104 Kilbarrack Road West	130	125	-4%	205	210	2%
	Overall	**442**	**448**	**1%**	**424**	**429**	**1%**
St. Donagh's Road / St. Donagh's Park	St. Donagh's Park	72	75	4%	99	105	6%
	St. Donagh's Road West	0	0		0	0	0%
	St. Donagh's Road East	355	337	-5%	316	333	5%
	Overall	**428**	**413**	**-4%**	**415**	**438**	**6%**
Grange Road / St. Donagh's Road	Grange Road North	595	587	-1%	638	644	1%
	St Donagh's Road	0	0		0	0	
	Grange Road South	545	551	1%	625	628	0%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	Overall	**1139**	**1138**	**0%**	**1262**	**1272**	**1%**
Longfield Road / R139	Longfield Road	265	243	-9%	100	104	4%
	R139 Grange Road East	381	375	-1%	260	252	-3%
	Grange Rise	31	30	-2%	275	275	0%
	R139 Grange oaRd West	600	597	0%	496	495	0%
	Overall	**1277**	**1245**	**-3%**	**1131**	**1126**	**0%**
R106 Coast Road / Red Arches Road	R106 Coast Road South	458	485	6%	800	742	-7%
	Red Arches Road	178	174	-3%	261	251	-4%
	R106 Coast Road North	648	630	-3%	575	579	1%
	Overall	**1284**	**1289**	**0%**	**1635**	**1572**	**-4%**
R106 Coast Road / R123	R106 Coast Road South	477	503	5%	864	819	-5%
	R123 Moyne Road	127	126	-1%	91	87	-4%
	R106 Coast Road North	518	501	-3%	441	448	2%
	Overall	**1122**	**1130**	**1%**	**1396**	**1354**	**-3%**
R123 / R124	R123 East	205	216	5%	316	304	-4%
	R123 West	516	538	4%	286	279	-3%
	R124 North / Drumnigh Road	390	376	-4%	377	396	5%
	Overall	**1112**	**1130**	**2%**	**979**	**979**	**0%**
Park Avenue / Marsfield Avenue	Marsfield	148	133	-10%	267	258	-3%
	Marsfield Avenue	49	46	-7%	141	116	-18%
	Park Avenue	352	334	-5%	106	91	-14%
	Overall	**549**	**512**	**-7%**	**514**	**466**	**-9%**
R808 / Kincora Rd	R808 North	21	21	-3%	4	4	-1%
	Kincora Road East	159	165	4%	19	19	0%
	R808 South	0	0		0	0	
	Kincora Road West	8	8	1%	131	133	2%
	Overall	**189**	**194**	**3%**	**154**	**157**	**2%**
Seafield Rd East / Seapark Road	Seafield Road East (East)	128	136	6%	51	51	0%
	Seapark Road	35	35	1%	81	82	1%
	Seafield Road East (West)	26	26	0%	47	46	-3%
	Overall	**188**	**197**	**4%**	**180**	**179**	**0%**
R808 / Mount Prospect Avenue	R808 North	88	87	-1%	165	166	0%
	Mount Prospect Avenue	139	143	3%	70	70	0%
	R808 South	12	12	1%	31	31	2%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	Overall	**239**	**242**	**1%**	**266**	**267**	**0%**
R105 / R808	R105 East	825	828	0%	663	668	1%
	R808 South	85	86	1%	173	173	0%
	R105 West	456	456	0%	613	612	0%
	R808 North	294	290	-1%	297	298	0%
	Overall	**1660**	**1660**	**0%**	**1746**	**1751**	**0%**
R105 / The Meadows	R105 East	861	864	0%	678	683	1%
	The Meadows	24	23	-1%	48	48	-1%
	R105 West	564	562	0%	800	801	0%
	Overall	**1449**	**1449**	**0%**	**1526**	**1532**	**0%**
R107 / R103	R107 North	561	559	0%	463	463	0%
	R103 East	182	184	1%	126	126	0%
	R107 South	499	499	0%	835	833	0%
	R103 West	206	205	0%	135	135	0%
	Overall	**1449**	**1447**	**0%**	**1559**	**1558**	**0%**
R107 / R808	R107 South	520	524	1%	676	678	0%
	R808 West	268	265	-1%	335	337	1%
	R107 North	553	551	0%	518	518	0%
	R808 East	280	281	0%	320	320	0%
	Overall	**1622**	**1622**	**0%**	**1849**	**1853**	**0%**
Watermill Road / Watermill Drive	Watermill Road East	23	23	2%	17	18	3%
	Watermill Drive	63	63	-1%	80	79	-1%
	Watermill Road West	74	73	0%	60	59	0%
	Overall	**159**	**159**	**0%**	**157**	**156**	**-1%**
Watermill Road /All Saints Road	Watermill Road East	23	23	2%	17	18	3%
	All Saints Road	0	0		0	0	
	Watermill Road West	9	8	-1%	6	6	0%
	Overall	**31**	**32**	**1%**	**23**	**24**	**2%**
R105 / R807	R105 Howth Road North	830	851	3%	673	655	-3%
	R807 Howth Road	398	395	-1%	735	733	0%
	R105 South	166	151	-9%	163	163	0%
	Overall	**1393**	**1397**	**0%**	**1571**	**1551**	**-1%**
Ennel Avenue / St. Brendan's Park	Ennel Avenue North	13	13	0%	34	34	3%
	Ennel Avenue South	10	10	0%	20	21	3%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
	St. Brendan's Park	0	0	0%	0	0	0%
	Overall	24	24	0%	54	55	3%
Moatfield Road / Ennel Avenue	Moatfield Road	7	7	2%	27	28	3%
	Ennel Avenue	10	10	1%	20	21	3%
	Moatfield Avenue	6	6	-2%	6	6	1%
	Overall	**23**	**23**	**0%**	**53**	**55**	**3%**
Moatfield Road / Moatfield Avenue	Moatfield Road South	7	7	1%	18	18	4%
	Moatfield Avenue	1	1	3%	4	4	0%
	Moatfield Road North	36	39	8%	46	46	-1%
	Overall	**44**	**47**	**7%**	**68**	**68**	**0%**
R104 / Moatfield Road	R104 North	319	320	0%	319	319	0%
	Moatfield Road	8	8	1%	22	23	3%
	R104 South	264	262	0%	411	410	0%
	Overall	**590**	**591**	**0%**	**752**	**751**	**0%**
R107 / R104	R107 North	565	564	0%	654	656	0%
	R104 East	297	295	-1%	284	284	0%
	R107 South	661	666	1%	800	799	0%
	R104 West	270	270	0%	271	271	0%
	Overall	**1794**	**1796**	**0%**	**2009**	**2010**	**0%**
R107 / Greencastle Road	R107 North	596	599	0%	613	614	0%
	Tonlegee	9	9	0%	48	48	0%
	R107 South	506	510	1%	608	609	0%
	Greencastle Road	156	154	-1%	268	268	0%
	Overall	**1267**	**1272**	**0%**	**1536**	**1539**	**0%**
Kilmore Road / R104	R104 East	650	659	1%	681	681	0%
	Kilmore Road	621	619	0%	497	497	0%
	R104 West	550	550	0%	743	741	0%
	Overall	**1821**	**1827**	**0%**	**1921**	**1919**	**0%**
R107 / Priorswood Road	R107 North	656	657	0%	903	906	0%
	Blunden Drive	413	417	1%	226	227	0%
	R107 South	429	431	1%	777	780	0%
	Priorswood Drive	131	130	-1%	146	146	0%
	Overall	**1628**	**1635**	**0%**	**2052**	**2058**	**0%**
	Grangemore Road	22	21	-5%	27	32	18%

Junction	Approach	AM Peak			PM Peak		
		DM	DS1	% Change	DM	DS1	% Change
Ardara Avenue / Kilfenora Drive	Ascaill Ard an Raha	0	0	0%	0	0	
	Kilfenora Drive	4	9	130%	25	25	0%
	Overall	**26**	**30**	**15%**	**52**	**57**	**9%**
Grangemore Road / Grangemore Crescent	Grangemore Road East	0	0	-33%	0	0	
	Grangemore Road West	4	9	130%	25	25	0%
	Grangemore Cres	22	21	-5%	27	32	18%
	Overall	**26**	**30**	**15%**	**52**	**57**	**9%**
Grange Road / Grangemore Road	Grange Road North	1110	1087	-2%	1002	1018	2%
	Grange Road South	741	749	1%	804	814	1%
	Grangemore Road	0	0		0	0	
	Overall	**1851**	**1835**	**-1%**	**1806**	**1832**	**1%**
Main Street / Belmayne Avenue	Belmayne Avenue North	124	109	-12%	73	74	2%
	Main Street East	151	151	0%	169	174	3%
	Belmayne Avenue South	345	350	1%	198	197	-1%
	Main Street West	414	412	-1%	141	140	-1%
	Overall	**1034**	**1022**	**-1%**	**581**	**585**	**1%**
Main Street /Hole in the Wall Road	Main Street East	191	191	0%	304	317	5%
	Hole in the Wall Road South	275	269	-2%	194	200	3%
	Main Street West	252	245	-3%	58	56	-3%
	Hole in the Wall Road North	173	173	0%	227	230	1%
	Overall	**891**	**878**	**-2%**	**783**	**803**	**3%**
Baldoyle Road / Burrowfield Road	Burrowfield Road	5	4	-26%	4	3	-38%
	Baldoyle Road South	373	369	-1%	685	654	-5%
	Warrenhouse Road	401	399	-1%	449	443	-1%
	Overall	**779**	**772**	**-1%**	**1138**	**1100**	**-3%**
R139 / Main Street	Main Street South	545	558	2%	592	591	0%
	R139	180	176	-2%	207	167	-19%
	Main Street North	628	617	-2%	610	613	0%
	Overall	**1353**	**1351**	**0%**	**1409**	**1371**	**-3%**

The effect on traffic and transportation from route choice and junction performance at most junctions is therefore a **neutral, imperceptible, medium-term effect**.

Junctions where the overall increase in traffic flow exceeded 5% were selected for potential further analyses (highlighted red in Table 6-42 and Table 6-43).

This is in accordance with Transport Infrastructure Ireland's Traffic and Transport Guidelines (PE-PDV-02-045, May 2015) that recommends that locations where projected traffic will exceed 5% of the traffic flow on the road network, where congestion exists or the location is sensitive, be subject to further analyses.

The following junctions were identified for further analysis:

1. Park Ave/Marshfield Ave – overall flow increases of about 16% (51 additional passenger car units (pcus)) observed during 2028 PM peak.
2. St Donagh's Rd/St Donagh's Pk – overall flow increases of 6% (23 additional pcus) observed during 2043 PM peak.
3. Moatfield Rd/Moatfield Ave, Ardara Ave/Kilfenora Dr, Grangemore Rd/Grangemore Cres – these junctions were highlighted in 2028 and 2043 based on the percentage changes whereas the actual additional pcu increases are minimal.

Having considered the low actual additional pcu increases, the effect of the Proposed Development on traffic and transportation with respect of route choice and junction performance at the junctions identified for potential further analysis is a **negative, slight or moderate, medium-term effect**.

6.5.2.4.3 Junction Modelling and Qualitative Assessment Outputs

Junction modelling combined with a qualitative assessment was used to provide estimates in terms of the potential change in queueing in the vicinity of the level crossings and resulting network performance. For more information on the junction modelling and qualitative assessment please refer to Appendix A6.1.

Vehicular Impacts

General Traffic

Queuing depends on two factors – the duration of the closure and the frequency of the closure. An increase in frequency of the closure will not necessarily result in an increase in queueing as the duration of these closures may be shorter and therefore will prevent long queues forming; if the volume of traffic is able to dissipate within the available opening times. In general, more frequent, shorter openings are likely to perform better than less frequent, longer openings, even if the total open time within the hour decreases.

The frequency of level crossing closures at Kilbarrack (Baldoyle Road) Level Crossing will increase from approximately four or five times per hour to six or 12 times per hour. The performance of Kilbarrack (Baldoyle Road) Level Crossing will deteriorate slightly for vehicles as the likelihood of vehicles incurring delay at the level crossing will increase due to the increased frequency of level crossing closures here. The duration of these closures may also increase to varying degrees, depending on the operational timetable adopted in the future. Observed closure times ranged between two and five minutes during the AM Peak Hour and around four minutes during the PM Peak Hour. The closure times are likely to be between three and five minutes in the future during both the AM Peak Hour and the PM Peak Hour.

Comparing the mean maximum queue lengths at Kilbarrack (Baldoyle Road) Level Crossing and at the Dublin Road/Baldoyle Road Junction, the assessed TSS1C timetable for 6TPH per direction shows an increase in most queues, however all remain within the available queueing capacity. The sensitivity analyses show that queue lengths are dependent on the timetable and may increase further depending on the offset but will mostly remain within the available queueing capacity. Queues may occasionally block back along the Kilbarrack northbound arm in the PM peak in some timetable scenarios.

The frequency of level crossing closures at Sutton Level Crossing will increase from approximately three or four times per hour to six or 12 times per hour. The performance of Sutton Level Crossing will deteriorate slightly for vehicles as the likelihood of vehicles incurring delay at the level crossing will increase due to the increased frequency of level crossing closures here. The duration of these closures may also increase to varying degrees, depending on the operational timetable adopted in the future. Observed closure times ranged between four and six minutes during the AM Peak Hour and between 2.5 and 5.5 minutes during the PM Peak Hour. The closure times are likely to be between two and four minutes in the future during both the AM Peak Hour and the PM Peak Hour.

Comparing the mean maximum queue lengths at Sutton Level Crossing and at the Sutton Cross Junction, the assessed TSS1C timetable for 6TPH per direction shows a decrease in most queues, with all remaining within the available queueing capacity. The sensitivity analyses show that queue lengths are dependent on the timetable and may increase depending on the offset but will remain within the available queueing capacity.

It is anticipated that the performance of Cosh and Claremont Level Crossings will deteriorate slightly for vehicles as the likelihood of vehicles incurring delay at the level crossing will increase due to the increased frequency of level crossing closures here. However, it is not expected to have a significant impact in terms of queueing due to the low volumes of vehicles that cross at these level crossings.

The effect of the Proposed Development on traffic and transportation in terms of general traffic is therefore a **negative, moderate, medium-term effect** on the whole. On highly trafficked days, for example during the summer months, queues are more likely to block back at Kilbarrack (Baldoyle Road) and Sutton Level Crossings. On these days the effects on abnormally high levels of traffic can be classified as a **negative, significant, medium-term effect**.

The DART+ Coastal North level crossings on the Howth Branch are currently closed for approximately 25% of the AM peak hour. In comparison, DART+ West level crossings are currently closed for 40-70% of the AM peak hour and in the case of DART+ Coastal South, the level crossings are currently closed for 45-65% of the AM peak hour.

With the implementation of the DART+ Coastal North project, the Howth Branch level crossing closure durations are predicted to increase to just over 50% of the AM peak hour. This correlates with existing closure times for other level crossings within the network, such as Porterstown (55%) and Clonsilla (52%) on the DART+ West network, as well as Sydney Parade (53%), Sandymount Ave (55%) and Strand Road (45%) on the DART+ Coastal South network.

Traffic volumes at the level crossings across the Howth Branch are currently approximately 1,700 vehicles in the AM peak hour, with the level crossings currently closed for approximately 25% of the time within this peak period. By comparison, at the level crossings along the DART+ Coastal South line, traffic volumes are currently approximately 2,800 vehicles in the AM peak hour, with the level crossing currently closed for approximately 55% of the time within this peak period. With the implementation of DART+ Coastal North, it is envisaged that the traffic volumes would remain relatively the same, but with level crossing closure durations increasing to approximately 50% of the peak hour.

Currently the level crossings on the Howth Branch are closed up to six times in the AM peak hour. The level crossings on the DART+ West network are currently closed up to nine times in the AM peak hour and the level crossings on the DART+ Coastal South network are closed up to 12 times in the AM peak hour.

With the implementation of DART+ Coastal North, the Howth Branch level crossings are estimated to increase level crossing closure frequencies to between six and 12 times in the AM peak hour, equivalent to current level crossing operations on the DART+ Coastal South line.

Approximately 1,700 vehicles currently cross the Howth Branch level crossings which currently close approximately six times in the AM peak hour. The implementation of the DART+ Coastal North project will mean that 1 700 vehicles may continue to cross; and closure frequencies may increase to up to 12 times in the AM peak hour in future. This corresponds to current operations on the DART+ Coastal South network, where two 800 vehicles currently cross; and where level crossings currently close up to 12 times in the AM peak hour.

While the proposed increased level crossing closure frequency and duration will increase, it will remain in line with, and below, current level crossing closure durations and frequencies in other parts of the network.

Emergency Vehicles

In terms of emergency services - the areas to the north and south of the rail line are normally served by the Kilbarrack fire station and the requirement to cross the rail line will therefore be rare. Queues may occasionally block back along the Kilbarrack northbound arm in the PM peak in some timetable scenarios and may on rare occasions overspill onto Dublin Road. In such an event, emergency services (fire, ambulance and garda) are able to bypass a general traffic queue to serve areas along Baldoyle Road or Station Road.

The effect of the Proposed Development on traffic and transportation in terms of emergency vehicles is a **neutral, imperceptible, medium-term effect**.

Image 6-71 Emergency Service Access

Public Transport Impacts

Table 6-44 Level Crossings & Affected Bus Routes

Level Crossing Name	Code	Current Affected Bus Routes	Future Affected Bus Routes	Frequency
Baldoyle Road Level Crossing	XQ001	H2	H2	Every 30 minutes Monday -Friday
			X78	4 times daily Monday - Friday
Sutton Level Crossing	XQ002	102		Every 30 minutes Monday – Friday
		102A		Once daily, Monday – Friday
		102C		Once daily, Monday – Friday
		102T		Once daily, Monday – Friday
			L81	Every 20 mins Monday - Friday Every 30 mins Saturday - Sunday
Cosh Level Crossing	XQ003	N/A	N/A	N/A
Claremont Level Crossing	XQ004	N/A	N/A	N/A
User Worked Level Crossing	XB001	N/A	N/A	N/A

The likelihood of buses incurring delay at the level crossing will increase due to the increased frequency of level crossing closures. It was also found that there will be an impact on queue lengths in the study area – in some cases queue lengths may reduce, however, in some cases queue lengths may increase. The sensitivity analysis has shown that queue lengths are likely to remain within the available queueing capacity, in all of these cases. Queues may occasionally block back along the Kilbarrack northbound arm in the PM peak in some timetable scenarios.

The assessment concludes that the crossings can continue to operate and provide an appropriate level of cross connectivity and accessibility whilst still meeting the increased DART service frequency requirement.

The effect of the Proposed Development on traffic and transportation in terms of general traffic is therefore a **negative, moderate, medium-term effect** on the whole. On highly trafficked days, for example during the summer months, queues are more likely to block back at Kilbarrack (Baldoyle Road) and Sutton Level Crossing. On these days the effects of abnormally high levels of traffic can be classified as a **negative, significant, medium-term effect**.

Pedestrian and Cycle Impacts

The effect of changes to the operating conditions of the Howth Branch line and associated level crossings on pedestrians and cyclists has been assessed. The baseline service of 3 trains per hour per direction (3TPH) and level crossing closures has been compared to the proposed worst-case scenario of 6 trains per hour per direction (6TPH TSS1C). All four level crossings were assessed using qualitative analysis methods, refer to Appendix A6.1 in Volume 4 of this EIAR.

The assessment looked at the changes to the quality of service for pedestrians and cyclists using the level crossings.

Level crossing closures will increase from three to six times per hour to six or 12 times per hour and therefore the likelihood for a pedestrian incurring delay at the level crossing will increase. The wait time at these level crossings is likely to continue to be between two minutes and five minutes.

The effect of the Proposed Development on traffic and transportation in terms of pedestrian and cyclists is a **negative, moderate, medium-term effect** on the whole. On highly trafficked days, for example during the summer months, pedestrian and cyclist volumes are more likely to increase at Cosh Level Crossing near Burrow Beach. On these days the effects of abnormally high levels of traffic can be classified as a **negative, significant, medium-term effect**.

6.5.2.5 Operational Impact of Permanent Loss of Parking Provision

Of the 19 stations included within the DART+ North Coastal project area, 14 stations provide car parking facilities for commuters. The four train stations that offer no car parking facilities include Harmonstown, Raheny, Kilbarrack, Clongriffin (underground carpark currently closed) and Howth Junction & Donaghmede Stations. Harmonstown and Kilbarrack, as well as Clongriffin Station also lack bicycle parking facilities, while bicycle parking is 250m distant from Killester station. A number of these stations are located within highly populated residential areas, where walking is mostly expected to serve as the last mile transport solution.

A study was conducted in the first quarter of 2020 to determine the occupancy rates of certain train station car parking facilities across the country. 12 car parks associated with the DART+ North Coastal were explored. The occupancy rates for the car parks varied between 9% and 99% in January 2020. Gormanston, recorded an average of 10.25 occupied parking spaces from the total 116. Clontarf Road station had the highest recorded occupancy rate with an average of 104.25 of the total 105 parking spaces being used.

The majority of parking facilities associated with zones C, D and E have sufficient capacity for the needs of commuters. Generally, in areas with greater residential density, the designated train station car parks have a greater occupancy.

When the scheme is operational the only permanent loss of parking will be at Rush and Lusk station where 10 car parking spaces will be removed. The survey data found that out of the 432 parking spaces currently available, only 233 were used. Reducing the available number of spaces to 422 will therefore have very little impact.

The effect of the Proposed Development at Rush and Lusk station on traffic and transportation in terms of car parking provision therefore, is a **negative, moderate, medium-term effect**. In all other areas the Proposed Development on traffic and transportation in terms of car parking provision is a **neutral, imperceptible, medium-term effect**.

6.6 Mitigation Measures

6.6.1 Construction Phase

The Construction Phase of the Proposed Development will generate an increased volume of related traffic at each of the Construction Compounds and work areas. This section sets out a series of mitigation measures and initiatives to reduce the impact of construction on traffic and transportation throughout the Construction and Operational Phase of development. The impact on delivery of rail services is to be agreed in conjunction with the NTA under the current gross contract arrangements that are in place.

6.6.1.1 Impact of Construction Trips

Construction Traffic Management Plan (CTMP)

No significant impacts are foreseen due to the generation of construction trips, due to the planned embedded mitigation through design and the development of a Construction Traffic Management Plan (CTMP). The CTMP is included within the Construction Environmental Management Plan (Appendix A5.1 of this EIAR) and will be further developed by the Contractor prior to construction, in liaison and with the agreement of the relevant local authorities. The CTMP includes a series of measures to manage the construction traffic and reduce the potential impacts throughout the Construction Phase. There are several mitigation measures to be introduced throughout the construction period to reduce the overarching impact of construction vehicles on commuters, both on rail and by car. These mitigation measures include:

- Routing of heavy goods vehicles (HGVs) away from sensitive areas such as schools, residential areas, and areas sensitive in terms of air quality;

- Use of sufficient clear signage to ensure that construction vehicles use only designated routes, such that HGVs refrain from using New Street within Malahide;
- Scheduled arrival of bulk deliveries and large loads to ensure that traffic congestion does not result from vehicles arriving simultaneously;
- Provision of holding areas to reduce congestion impacts along local roads;
- Scheduling deliveries before AM peak traffic times, or throughout the day between AM and PM peak traffic periods;
- Encouraging construction workers to access sites via sustainable modes of transport to reduce the capacity of cars on street and surrounding the compounds, especially in rural construction areas with reduced availability of car parking;
- Facilitating on-site recycling of materials to reduce vehicle movements for importing and exporting;
- Keeping access routes clear of construction debris that may create trip hazards for workers and pedestrians;
- Implementation of wheel washing facilities to prevent deposition of materials and construction related dirt to be deposited on the surrounding road network;
- Implementation of appropriate traffic management measures to ensure that compound access does not create major disruption;
- Ensure appropriate vehicles for importing and exporting goods are acquired to minimise environmental impacts and vehicular capacity on the surrounding access roads;
- A reduction in speed limits in the vicinity of the site may be managed with the use of appropriate signage and will maintain a consistent flow of traffic, especially within the areas of Malahide, Donabate and Drogheda MacBride Stations;
- All vehicles should be suitably serviced and maintained to avoid leaks of spillages of oil, petrol, diesel, as well as other carbon emissions and combustible materials; and
- Provision of safe footways and cycleways where current infrastructure has been impacted by construction works and vehicular access. Physical barriers and segregated pedestrian movements should be retained throughout the construction process.

The above mitigation measures will ensure that the presence of construction traffic will not lead to an increase in environmental issues and concerns related to local vehicular and pedestrian mobility. Delivery of goods and movement of construction traffic will be managed accordingly to ensure that traffic congestion is kept to a minimum.

Mobility Management Plan (MMP)

A MMP will be implemented for the duration of construction and the measures detailed below and will be further developed by the Contractor, in liaison and with the agreement of the relevant local authorities. The Construction Traffic Management Plan (CTMP) (included in the CEMP in Appendix A5.1 of Volume 4 of this EIAR) references the need for a detailed MMP. This MMP will manage trips associated with construction staff. The MMP is set out to achieve the following objectives:

- To reduce and discourage the use of the private car as the primary means of travel when accessing the Construction Compounds as far as possible within daytime working hours;
- Promote the use of sustainable modes of transport such as walking, cycling and public transport when travelling to and from the Construction Compounds;

- To liaise with the Local Authorities, National Transport Authority and Iarnród Éireann to encourage and facilitate staff active travel take up;
- To create a unified network of stakeholders to support the constraints outlined within the mitigation measures while accessing the Construction Compounds; and
- To Coordinate with adjacent construction projects in relation to forming a combined and supported Mobility Management Plan.

In order to achieve the MMP objectives, initiatives have been proposed for each of the modes of transport. These initiatives are based on current infrastructure and public transport routes and facilities. The initiatives will be developed for each of the Construction Compounds, where a best practice guide will be applied accordingly.

In order to maintain staff awareness of sustainable transport modes, campaigns will be run throughout the Construction Phase. The benefits of active travel modes will be promoted for both personal health and the health of the environment.

A Coordinator will be appointed to manage the implementation of the Mobility Management Plan measures, setting targets with respect to sustainable transport, and ensuring targets are achieved through a series of initiatives.

Table 6-45 presents a list of recommended measures and actions.

Table 6-45 Recommended Mobility Management Initiatives and Actions

Mode	Initiatives	Responsibility/Ownership	Timescale
Walking	Communicate safe walking routes and provision of bus stop/train station and services	Action Plan Coordinator	At start of construction and ongoing
	Encourage lunch time walks to encourage mode travel rather than use of the private car		
	Offer health checks for employees interested in becoming more active		
Cycling	Highlight safe cycle routes and bicycle parking facilities in the vicinity of the compounds	Action Plan Coordinator	At start of construction and ongoing
	Create a Staff Cycle group to encourage users to cycle together		
	Survey and provide a sufficient amount of cycle parking to encourage cycling		
	Explore the need of ancillary facilities such as showers and changing areas where possible.		
Public Transport	Highlight available public transport stations and route maps and timetables in a prominent location on site.	Action Plan Coordinator	At start of construction and ongoing
	Publicise real-time passenger information apps and website where relevant.		
Car Sharing	Initiate a car sharing scheme for contractors and staff that live along the same route.	Action Plan Coordinator	

Mode	Initiatives	Responsibility/Ownership	Timescale
	Provide incentives to car share by allocating car parking spaces to those car sharing.		At start of construction and ongoing
Parking	Monitor parking and ensure that there is no overspill of car parking into neighbouring car parks and local roads.	Action Plan Coordinator	At start of construction and ongoing
	Ensure that staff parking within the compounds is set up most effectively to provide sufficient parking for the needs of workers		
Other Measures	Inform staff of health and fitness benefits of walking and cycle on noticeboards and through staff mailing list.	Action Plan Coordinator	At start of construction and ongoing
	Include travel information sustainable transport modes in staff induction packs		

6.6.1.2 Impact of Road Closures

The impact of the Construction Phase will vary across each compound. Operations will be in place from between one month and two years, depending on the Construction Compound. The impact of construction traffic flow must be managed and monitored throughout the Construction Phase to ensure that impacts on all modes are limited. The measures listed previously will contribute to traffic management in the surrounding road networks, including routing, hours of work, and compound locations. Construction vehicles will make use of the main highway network with limited interference with residential areas unless there is an absolute requirement. The construction traffic management plan (CTMP) will be further developed and fully implemented to ensure adequate measures are taken to minimise traffic delays, disruption and maintain access to properties in the surrounding areas where modifications are taking place.

Beaverstown Golf Club Access

An existing Eir cable crosses the railway just to the south of the overbridge (OBB35) carrying the access road for Beaverstown Golf Club. This needs to be diverted underground. A temporary work area is required to either side of the bridge. The road will need to be temporarily closed (full road closure) under traffic management for the duration of the diversion, likely for approximately 3 days, and temporarily closed (partial road closure) for approximately 1 week.

Pedestrian access to the golf club will be maintained during both full and partial closures. Upon agreement with Eir, it may also be possible to carry out these works at nighttime to minimise disruption to the Beaverstown Golf Club.

Rogerstown Lane

The existing overhead line, OH-DV5 that crosses the railway line is planned to be diverted along Rogerstown Lane over OBB38. Rogerstown Lane will need to be temporarily closed (full road closure) under traffic management for the duration of the diversion in that area, approximately a week. The existing field accesses would be used to access the agricultural land areas.

Local access for all modes will be maintained throughout the road closure and construction period.

Harbour Road Closure

It will be necessary to close Harbour Road over-night on several occasions, or over a small number of weekend days, to site a crane for lifting large structural sections onto or off the Balbriggan viaduct. Traffic would need to be diverted away from the area during these periods. A site specific traffic management plan (TMP) will be established to coordinate this process once relevant consultation has taken place with interested parties.

L1620 Station Road

An existing Eir cable crosses the railway at Gormanston Station and is planned to be diverted underground. A temporary work area is required to either side of the bridge, OBB 66. The road will need to be temporarily closed (full road closure) under traffic management for the duration of the diversion, likely for approximately for 3 days. A partial road closure for 1 week will also be required to undertake these works. Pedestrian access will be maintained during both full and partial closures.

Access to Gormanston station will be maintained throughout the road closure and partial closure.

R132 Dublin Road

For the replacement works at the Dublin Road bridge, there will be some weekends where full closure of the road will be required and other extended periods where the road will be reduced to a single lane under a traffic light contra-flow system. Removal and installation of bridge deck units is when total closure will be required; work on abutments is when single lanes will need to be put into operation.

Traffic management will be established based on latest regulations to ensure the safety of all road users (including cyclists), pedestrians and mobility impaired people. Where footpaths or off-road cycle tracks are affected by construction, a safe route will be provided past the works area where practicable. Arrangements will be detailed in a subsequent construction traffic management plan.

During demolition, the road will need to be closed completely, during which a traffic diversion will be in place. These periods are likely to be for only a few days at a time, limited to weekends. Whenever there is at least one lane of traffic open under the bridge it is planned that there will be a public footpath too. This will be closed when the road is fully closed, for safety reasons. Access to the station car park will be maintained during full road closures.

St Mary's Villas

St. Mary's Villas may have periods of closure where it leads down onto the R132 Dublin Road, depending on later design, methodology planning and traffic management layouts. These periods are likely to be for only a few days at a time, probably over weekends. Residents of St. Mary's Villas will maintain access to their properties throughout the duration of the works and during periods of road closures.

Railway Terrace

Railway Terrace, at Drogheda, will become a temporary cul-de-sac whilst the OBB80/A/B bridge is replaced. A temporary access road will be constructed to the north linking to Marsh Road (R150) to facilitate access to properties on McGraths Lane, to support the northern compound and to provide road vehicular access to the bridge site.

6.6.1.3 Impact on Car Parking

The contractors and construction workers' vehicles will be parked within the designated areas associated with each compound. While the use of sustainable modes of transport is encouraged, the Mobility Management Plan (MMP) will establish initiatives to manage parking throughout the construction period. It must be ensured that there is no construction related parking on public roads or in areas designated for use by the public.

In order for train stations to maintain parking efficiency for rail users, Iarnród Éireann will continue to monitor the amount of parking, where there will be an increased capacity for public parking at the latter stages of construction. Public car parking spaces will be lost at a number of stations, with this temporary loss of car parking primarily in the areas of the railway to be electrified between Malahide and Drogheda. The greatest loss of commuter car parking will occur at Donabate station followed by Drogheda MacBride Station as a result of the Construction Compounds in these facilities. At the Drogheda MacBride Station it is recommended that the contractor be limited to only occupy a maximum of 110 spaces at any one time during the overall period of works, these to be within one or both of the two compounds.

The contractor will make every effort to reduce the footprint of the compound as the construction programme progresses in order to maximise the number of car parking spaces available to the public.

6.6.1.4 Impact on Rail Network

No significant impacts are foreseen on the Belfast – Dublin line as works will take place at night-time or over weekends. Replacement bus services will be provided where rail services are impacted during these times.

The impact on rail services along the Drogheda-Navan Rail Line will be **negative, significant and temporary**. Meantime it is planned to retain as much functionality of the railway line as reasonably possible during the works, making use of passing lanes where safe to do so.

6.6.1.5 Impact on Bus Network

Bus routes impacted in Drogheda (D4, D5, 101, 101X) will be impacted as a result of the proposed bridge modification works and subsequent road closures. Where relevant, bus stops will be temporarily relocated to continue the bus service. The impact on bus services in Drogheda along R132 Dublin Road will be **negative, slight and temporary.**

6.6.2 Operational Phase

6.6.2.1 Impact of Increased Level Crossing Closure Times

Along the Howth Branch, significant effects on vehicular traffic and public transport may be experienced during abnormal highly trafficked days, as a result of increased level crossing closure times, for example during the summer months. In order to mitigate against potential blocking back of queues from Kilbarrack (Baldoyle Road) and Sutton Level Crossing it is proposed to provide yellow box markings at the Dublin Road & Sutton Road junctions to prevent the junction from being blocked and impacting on vehicular and public transport movements. Yellow box markings are already provided at all other major junctions along Sutton Road and Baldoyle Road.

Significant effects may also be experienced by pedestrians and cyclists during abnormal highly trafficked days, for example at Cosh Level Crossing near Burrow Beach. Law enforcement officials will continue to man the level crossing on highly trafficked days, to ensure efficient operations.

6.6.2.2 Impact of Permanent Loss of Parking Provision

It should be encouraged that commuters living in close proximity to the railway station will travel to and from via sustainable transport modes. The promotion of sustainable transport must be assisted by good quality infrastructure. An increase in cycle parking facilities, as well as bike lockers should install confidence in its users. The retention and addition of car parking at train stations should only be provided as a last resort, when all other options have been explored.

6.7 Residual Effects

6.7.1 Construction Phase

The Construction Phase of the Proposed Development has been developed to minimise the impact on all users in its vicinity. The likely overall effects are considered to be **neutral and slight negative** and mitigation measures have therefore been proposed. The residual effects, with the implementation of mitigation measures, are summarised in Table 6-46.

Table 6-46 Summary of Residual Effects (Construction)

	Description of Change	Significance of Effect Without Mitigation	Mitigation/ Enhancement Measure	Potential Residual Effects After Mitigation
Vehicle Traveller – Driver Delay	Limited increase in traffic on the surrounding road due to construction traffic network during the peak hours.	Moderate Negative	Implementation of a CTMP and Mobility Management Plan	Slight Negative
Pedestrians and Cyclists – Severance and delay	Closure of Dublin Road during bridge lifts	Moderate Negative	Alternative routes and reopening of the facilities as quickly as possible	Slight Negative

	Description of Change	Significance of Effect Without Mitigation	Mitigation/ Enhancement Measure	Potential Residual Effects After Mitigation
Public Transport Users	Route changes will be required to bus services during full road closures. Temporary closure of the railway line for short periods of times.	Moderate Negative	Re-routing of buses and provision of rail replacement services	Slight Negative
Car Parking	Loss of car parking during the construction period at some stations and private car parks	Slight negative	Car parking will be returned to use as soon as possible once works are completed and safe to do so.	Neutral

6.7.2 Operational Phase

The Proposed Development has been developed to minimise the impact on all users in its vicinity. The overall impact is considered to be **neutral and slight negative** and mitigation measures have therefore been proposed. The residual effects, with the implementation of these mitigation measures are summarised in Table 6-47.

Table 6-47 Summary of Residual Effects (Operational)

	Description of Change	Significance of Effect Without Mitigation	Mitigation/ Enhancement Measure	Potential Residual Effects After Mitigation
Rail Capacity and Mode Share	Increased service/frequency	Moderate Positive	N/A	Moderate Positive
Vehicular Traffic (route choice and network performance)	Decreased road-based traffic demand	Neutral	N/A	Neutral
Junction Performance and Bus Services at Level Crossings	Increased queuing and delay at level crossing	Moderate Negative Significant Negative (in summer)	Provide yellow box markings at the Dublin Road & Sutton Road junctions Promotion of sustainable transport	Moderate Negative Significant to Moderate Negative (in summer)
Car Parking	Permanent Loss of 10 car parking spaces	Moderate Negative	Promotion of sustainable transport	Neutral
Journey Time (JT)	Slight Increase in journey time along LC closure routes whereas other routes show slight reduction of JT.	Neutral	N/A	Neutral

	Description of Change	Significance of Effect Without Mitigation	Mitigation/ Enhancement Measure	Potential Residual Effects After Mitigation
Pedestrian and Cycle	Delay at level crossing	Moderate Negative Significant Negative (in summer)	N/A	Moderate Negative Significant Negative (in summer)

6.8 Cumulative Effects

The cumulative assessment of relevant plans and projects is undertaken separately in Chapter 26 (Cumulative Effects) in Volume 2 of this EIAR.