DART+ Coastal North

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME 1: NON-TECHNICAL SUMMARY

JULY 2024

NTA Údarás Náisiúnta Iompair National Transport Authority

Rialtas na hÉireann Government of Ireland | Tionscadal Éireann Project Ireland 2040

Iarnród Éireann Irish Rail

ARUP

CONTENTS

VOLUME 1: NON-TECHNICAL SUMMARY

1. INTRODUCTION

This Non-technical Summary (NTS) is prepared for the Environmental Impact Assessment Report (EIAR) for the DART+ Coastal North project ("the Proposed Development").

The DART+ Coastal North Project is part of the wider DART+ programme which is a key transportation improvement programme to form a high quality and integrated public transport system in the Greater Dublin Area (GDA), bringing benefits for new and existing communities. It will assist in providing a sustainable transport system and a societal benefit for current and future generations.

The Proposed Development is the third of the infrastructural projects to launch as part of the DART+ Programme, which consists of five projects in total.

The DART+ Coastal North project, 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 railway line. The extents of the DART+ Coastal North project are presented in Image 1-1.

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. In addition, the DART+ Coastal North project requires that some track modifications be implemented, including the provision of turnback facilities at Malahide, Clongriffin and Howth Junction & Donaghmede Stations. These modifications are essential to facilitate the increase in train services by improving operational flexibility, allowing trains to be turned back clear of continuing services and to allow for a higher frequency and a more reliable service.

The majority of proposed works and interventions are expected to be carried out within the existing railway corridor boundary. Some works and interventions, however, will be required outside of Iarnród Éireann (IÉ) / Córas Iompair Éireann (CIÉ) land such as:

- Bridge modifications/improvements to facilitate extended electrification;
- Construction of substations (to facilitate the provision of power to the line); and
- Use of land for temporary construction/storage compounds.

Detailed drawings of the Proposed Development are provided in the Railway Order application.

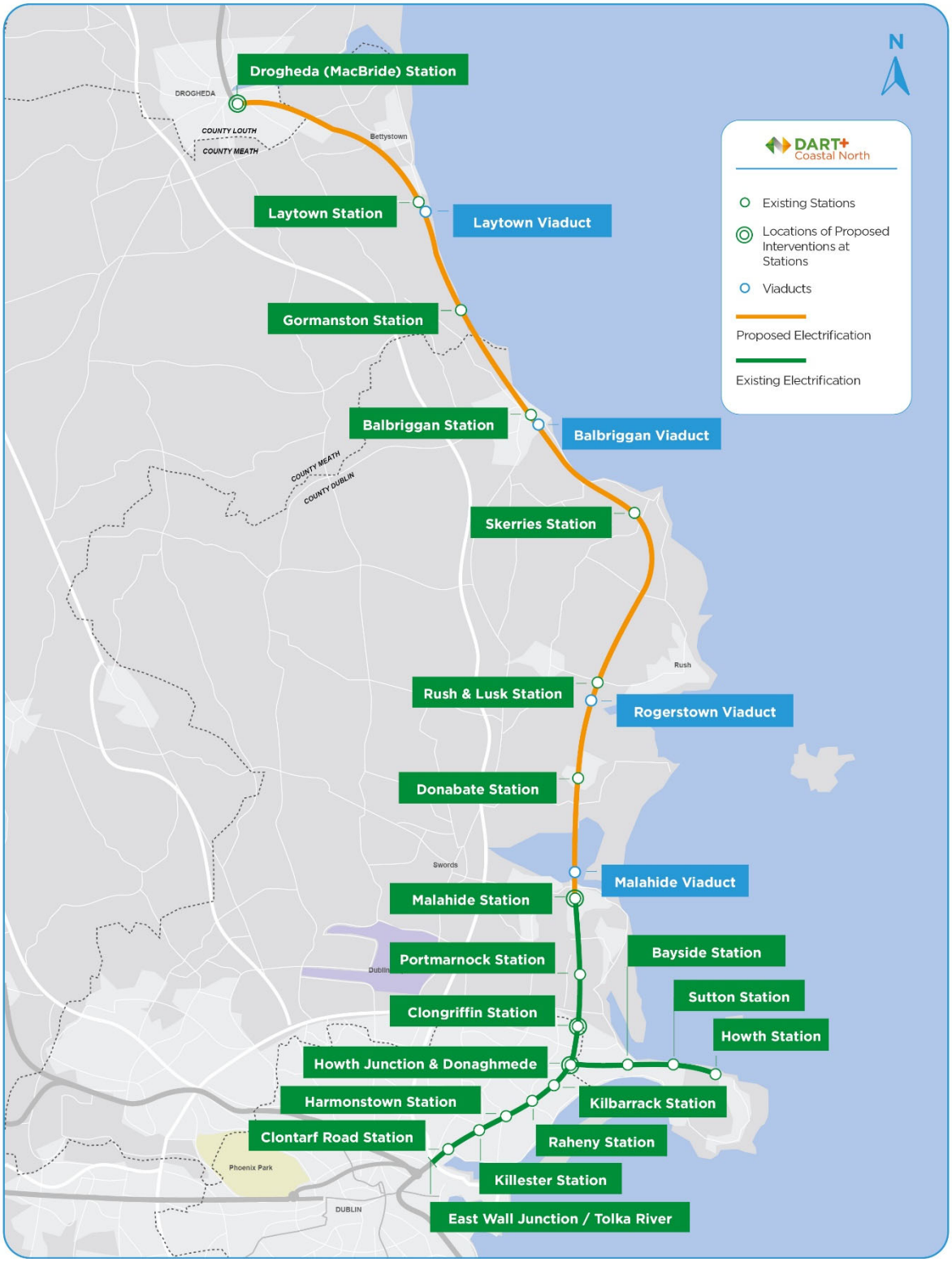


Image 1-1 Schematic of DART+ Coastal North project

1.1 Aims and Objectives

The DART+ Programme is a transformative programme of projects that aims to modernise and improve existing rail services in the GDA. It will see the DART network grown from its current 50km in length to over 150km.

The primary objective of the DART+ Programme is to support urban compact growth and contribute to reducing transport congestion and emissions in the Dublin region by enabling modernised high-quality commuter rail services between Dublin City Centre and the areas of Drogheda, Maynooth, Dunboyne, Celbridge and Greystones and thereby providing a safe, sustainable, efficient, integrated, and accessible public transport service along these corridors, see Image 1-2 below.

Image 1-2 DART+ Programme benefits (source: www.dartplus.ie)

Sub-objectives of the DART+ Programme include the following:

- Cater for existing heavy rail travel demand and improve customer services along established rail corridors in the Greater Dublin Area ("GDA") through the provision of a higher frequency, higher capacity, electrified heavy rail service which supports sustainable economic development and population growth;
- Improve accessibility to jobs, education, and other social and economic opportunities through the provision of improved inter-rail and inter-modal connectivity and integration with other public transport services;
- Enable further urban compact growth along existing rail corridors, unlock regeneration opportunities and more effective use of land in the Greater Dublin Area, for present and future generations through the provision of a higher capacity heavy rail network;

- Deliver an efficient, sustainable, low carbon and climate resilient heavy rail network, which contributes to a reduction in congestion on the road network in the Greater Dublin Area and which supports the advancement of Ireland's transition to a low emissions transport system and delivery of Ireland's emission reduction targets; and
- Provide a higher standard of customer experience including provision of clean, safe, quiet, modern vehicles and a reliable and punctual service with regulated and integrated fares.

1.2 Railway Order

The Transport (Railway Infrastructure) Act 2001 (as amended and substituted) ("the 2001 Act") and as recently further amended by the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 in Statutory Instrument No. 743/2021 ("the 2021 Regulations") provides for the application for a Railway Order ("RO") by inter alia CIÉ to An Bord Pleanála ("the Board").

The Railway Order application is made pursuant to the provisions of section 37 of the 2001 Act. Section 37 of the 2001 Act requires, inter alia, that the application be made in writing and be accompanied by: (a) a draft of the proposed Railway Order; (b) a plan of the proposed railway works; (c) 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 (d) a statement of the likely effects on the environment of the proposed railway works (this Report).

A statement 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).

A Railway Order is the statutory consent to an applicant providing authorisation to construct, maintain, improve and operate the railway or railway works. Railway works and the procedure for obtaining a Railway Order is governed by the Transport (Railway Infrastructure) Act 2001, as amended and substituted.

1.3 Requirement for an EIAR

As referenced above, a Railway Order application must be accompanied by a statement of the likely effects on the environment of the proposed railway works (EIAR). This EIAR forms part of the Railway Order application that is submitted by CIÉ to the Board for its approval of the Proposed Development. The EIAR in relation to this Railway Order application has been compiled in accordance with the requirements of the EIA Directive (2011/92/EU) *Assessment of the effects of certain public and private projects on the environment* as amended by Directive 2014/52/EU), the information referred to in Section 39 of the 2001 Act and with regard to relevant guidance documents and guidelines.

1.4 The EIA Process

Environmental Impact Assessment (EIA) is a process undertaken to assess the effects of projects on the environment, in accordance with European Directives (as above). Broadly speaking, the EIA process involves a number of steps which includes the production of an EIAR.

An EIAR is a statement prepared by the developer, providing information on the significant effects on the environment based on current knowledge and methods of assessment.

It is carried out by competent experts, with appropriate expertise to provide informed assessment on the environmental factors as required under the EIA Directive.

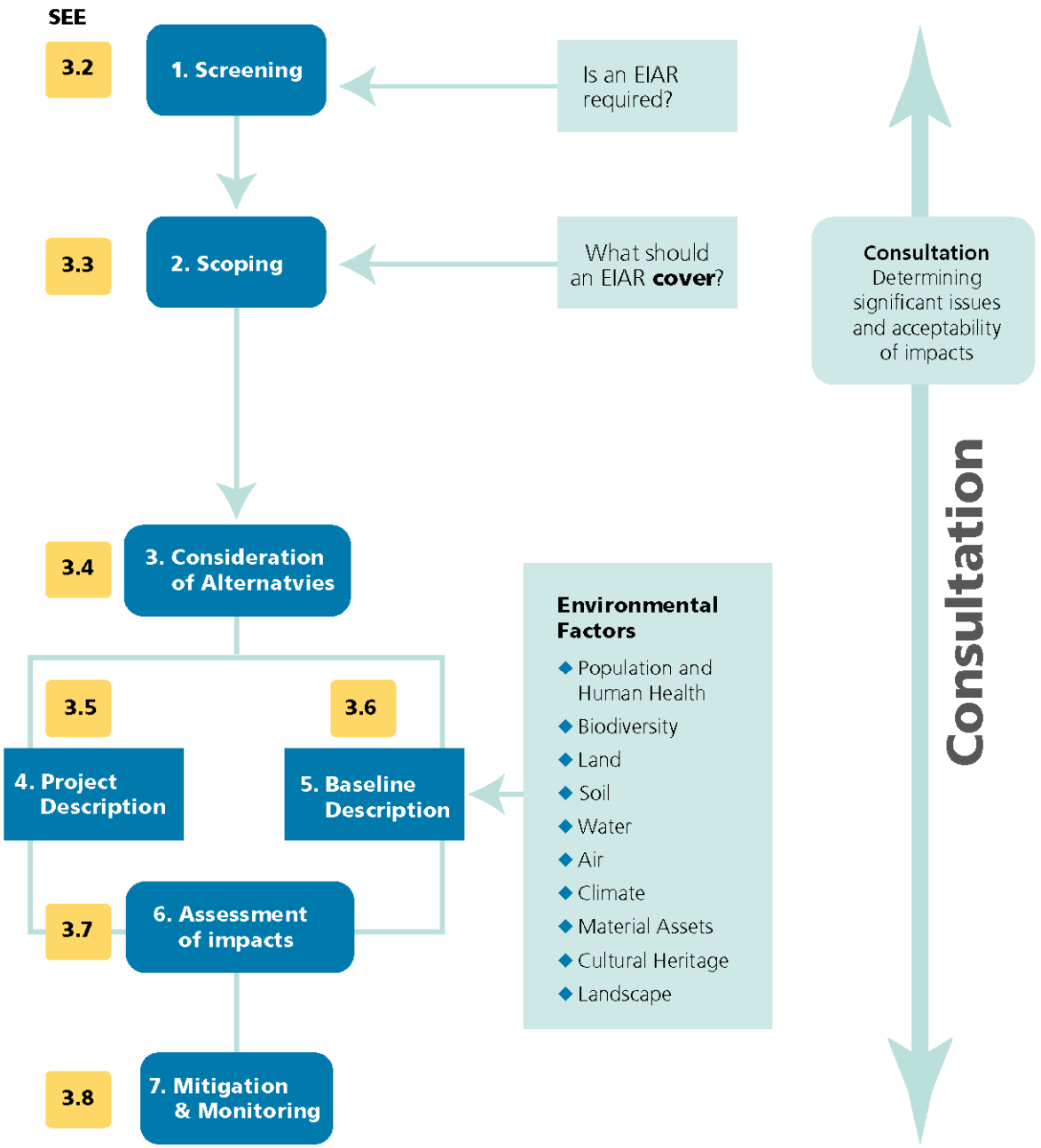
The EIAR consists of a systematic analysis and assessment of the potential effects of a proposed development on the receiving environment.

This EIAR will be used by the Board to make a decision to consent or refuse the application or to seek further information if required. In line with current guidance, the EIA for the project commenced at the project design stage.

The Board is the competent authority for the purpose of carrying out an environmental impact assessment of the Proposed Development.

1.4.1 Key Stages of the EIA Process

The key stages of the EIA process are illustrated in Image 1-3:



The information that must be included in an EIAR is shown as seven steps in sequence in the diagram above. The environment is described under a number of specific headings that are shown on the right. Adherence to this general sequence and structure helps ensure an objective and systematic approach.

Image 1-3 Key Stages of the EIA Process in Sequence (EPA, 2022)

1.5 Structure of the EIAR

This EIAR has been prepared on behalf of the Applicant, CIÉ/IÉ by Arup with the assistance of a team of competent experts. It is presented in five volumes as follows:

Volume 1: Non-Technical Summary

Volume 2: Main Text

Chapter 1: Introduction

Chapter 2: Policy Context and Need for the Project

Chapter 3: Alternatives

Chapter 4: Description of the Proposed Development

Chapter 5: Construction Strategy

Chapter 6: Traffic and Transportation

Chapter 7: Population

Chapter 8: Biodiversity

Chapter 9: Land and Soils

Chapter 10: Water (including Hydrology and Flood Risk)

Chapter 11: Hydrogeology

Chapter 12: Air Quality

Chapter 13: Climate

Chapter 14: Noise and Vibration

Chapter 15: Landscape and Visual Amenity

Chapter 16: Material Assets: Agricultural Properties

Chapter 17: Material Assets: Non-agricultural Properties

Chapter 18: Material Assets: Utilities

Chapter 19: Material Assets: Resources and Waste Management

Chapter 20: Archaeology and Cultural Heritage

Chapter 21: Architectural Heritage

Chapter 22: Electromagnetic Compatibility and Stray Current

Chapter 23: Human Health

Chapter 24: Major Accidents and Disasters

Chapter 25: Interactions

Chapter 26: Cumulative Effects

Chapter 27: Summary of Mitigation and Monitoring Measures

Volume 3A: Technical Figures

Volume 3B: Photomontages

Volume 4: Technical Appendices

Supporting Environmental Documents

1.6 Consultation

Consultation during the design and environmental impact assessment process is a key element as part of any project. An overview of the statutory, non-statutory and public consultations that have informed the design and environmental assessments throughout this EIAR is presented below.

The main consultation stages as part of the project development include the following:

- Pre-Application Consultation with the Board (January 2022 – February 2024);
- Two phases of non-statutory Public Consultation:
    - Consultation on the Emerging Preferred Option – Non-statutory Public Consultation no.1 (24 February – 8 April 2022);
    - Consultation on the Preferred Option - Non-statutory Public Consultation no.2 (9 May 2023 - 23 June 2023);
- EIA Scoping Report – Informal Scoping Consultation (6 March – 18 April 2023); and
- Statutory consultation as part of the EIA / Railway Order application process.

Technical engagement with key stakeholders was ongoing throughout the design development and EIA process to inform and consult on issues as they arose.

2. POLICY CONTEXT AND NEED FOR THE PROJECT

This section addresses the policy context and the need for the proposed DART+ Coastal North project. In addition, a separate Planning Report with further detail has been prepared as part of the suite of documentation for the Railway Order application package. The Planning Report sets out the Proposed Development's compliance with the key planning policy outlined within this chapter.

2.1 Project Need and Strategic Fit

The rail network in Ireland and more particularly in the Dublin Metropolitan Area is a 19th century legacy, which represents a significant national asset in that it provides high-capacity public transport corridors into and through the city centre. The expansion of the heavy rail network has been a key long-term objective of CIÉ, IÉ and statutory transport plans for a significant period. The expansion of the heavy rail network has been stop-start in nature and influenced by available Exchequer funding. The commissioning of the DART in the 1980's was a huge public transport success. Subsequent funding was provided in the 1990's and early 2000's to improve the rail network and increase capacity. However, due to the national economic downturn in 2008, capital investment was significantly constrained.

Project Ireland 2040 comprises the National Planning Framework (NPF) and the supporting investment package contained in the National Development Plan (NDP). The National Development Plan recommended that the DART+ Programme (previously termed DART Expansion) should proceed to deliver priority elements including investment in new train fleet, provision of new infrastructure and electrification of existing lines. The NPF and NDP state that the focus should be on non-underground tunnel elements of the programme using existing tracks. The National Development Plan 2021-2030 was published in October 2021, and it recognised the DART+ Programme as the "cornerstone of rail investment" within the lifetime of Project Ireland 2040.

Advancement of priority elements of the DART+ Programme is now approved in principle under the National Development Plan 2021-2030 and DART+ Coastal North will be the third of the DART+ Programme packages that will be lodged with An Bord Pleanála for the approval of a Railway Order application.

The DART+ Coastal North project is a significant infrastructure project that will deliver a range of benefits to the Greater Dublin Area (GDA). The Proposed Development will extend the electrified DART network from Malahide to Drogheda, increase rail capacity on the Northern Line between Dublin City Centre and Drogheda, and provide additional turnback facilities at Drogheda MacBride, Malahide, Clongriffin and Howth Junction & Donaghmede Stations. These improvements will provide a fast, frequent, reliable, and sustainable transport option for people living and working in the GDA. The Proposed Development will also support economic and population growth, encourage a modal shift from private car usage to public transport, and help to decarbonise the transport sector.

The Proposed Development is driven by several key objectives:

1. To Facilitate Growth in Demand: The GDA is experiencing rapid population growth, which is putting strain on the existing transportation infrastructure. The DART+ Coastal North project will provide the necessary capacity to meet this demand, ensuring that residents and commuters have access to a reliable and efficient public transportation system, while also unlocking development potential of new communities along the corridor.

2. To Play an Important Part in Achieving Environmental Targets: The transport sector is a major source of greenhouse gas emissions. The DART+ Coastal North project will help to reduce emissions by providing a more sustainable mode of transportation.

3. To Support Economic and Population Growth: The project will support economic growth by providing businesses with access to a skilled workforce and by making it easier for people to travel to and from work. It will also support population growth by making it more attractive to live in towns and villages along the rail corridor.

4. To Encourage and Enable a Modal Shift: The Proposed Development will encourage people to switch from private cars to public transport by providing a more attractive and convenient option. This will help to reduce traffic congestion, improve air quality, and reduce greenhouse gas emissions.

5. To Modernise the Railway: The Proposed Development will upgrade the Northern Line to include additional turnback facilities at Drogheda MacBride, Malahide, Clongriffin and Howth Junction & Donaghmede Stations. This will improve the operational capacity of the railway line and allow for more frequent and reliable train services.

6. To Enable Compact Growth: The Proposed Development will support compact growth by making it easier for people to live, work, and play in towns and villages along the rail corridor. This will help to reduce urban sprawl and create more sustainable communities.

The DART+ Coastal North project will provide much-needed capacity, improve reliability, and encourage a modal shift from private cars to public transport. The Proposed Development will also play an important role in achieving environmental targets and supporting economic and population growth.

2.2 Policy Context

The DART+ Programme is central to the delivery of planning and transportation policy objectives at international, European, national, regional and local level. A review of the key planning and policy documents are presented in the following sections.

2.2.1 International policy

2.2.1.1 United Nations 2030 Agenda (United Nations, 2015)

In September 2015, Transforming Our World, the 2030 Agenda for Sustainable Development (the 2030 Agenda) was adopted by all 193 Member States of the United Nations (UN). The 2030 Agenda aims to deliver a more sustainable, prosperous, and peaceful future for the entire world, and sets out a framework of 17 Sustainable Development Goals (SDGs) for how to achieve this by 2030.

Sustainable Development Goals 9 and 11 are the most directly relevant to the Proposed Development:

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Target 9.1: *Develop quality, reliable, sustainable, and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human wellbeing, with a focus on affordable and equitable access for all.*

Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.

Target 11.2: *By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.*

The DART+ Programme including the DART+ Coastal North project is supported by the goals and targets set out in the relevant SDGs. It will enable more efficient, safe and integrated sustainable transport movement. In Ireland, the SDGs are being implemented through the National Implementation Plan 2022-2024, which is in direct response to the 2030 Agenda. It provides a whole of-government approach to implement the 17 SDGs.

2.2.2 European policy

2.2.2.1 EU White Paper on Transport: Roadmap to a single European Transport Area - Towards a competitive and resource efficient transport system

In 2011, the European Commission adopted the White Paper Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system in the context of the Union's 2020 growth strategy. The vision of the White Paper spans four decades, up to 2050, but also sets earlier goals for 2020 and 2030. The Commission's vision for a competitive and sustainable transport system involves transport that uses cleaner energy, better exploitation of modern infrastructure and a reduction in its negative impact on the environment.

The White Paper defines ten goals designed to guide actions and measure progress to achieve a 60% reduction in CO2 emissions and comparable reduction in oil dependency. Goals to which the DART+ Programme is aligned:

Goal 1: Halve the use of 'conventionally fuelled' cars in urban transport by 2030; phase them out in cities by 2050; achieve essentially CO2 free city logistics in major urban centres by 2030.

Goal 4: By 2050, complete a European high-speed rail network. Triple the length of the existing highspeed rail network by 2030 and maintain a dense railway network in all Member States. By 2050 the majority of medium-distance passenger transport should go by rail.

The proposed DART+ Coastal North project supports the goals of the EU White Paper to improve resource efficiency of the transport system by electrifying the Malahide to Drogheda rail lines. The proposed DART+ Coastal North project will also enable the increase in frequency and capacity of rail services which will increase competitiveness of the rail network as a mode of travel within urban, and inter-urban areas.

2.2.2.2 Trans-European Transport Network

The Trans-European Transport Network (TEN-T) is a European Union policy directed towards the implementation and development of a Europe-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports and rail-road terminals. The objective of TEN-T is to close gaps, remove bottlenecks and eliminate technical barriers that exist between transport networks of EU Member States, strengthening the social, economic and territorial cohesion of the Union and contributing to the creation of a single European transport area.

Regulation (EU) No 1315/2013 sets out the requirements for rail infrastructure that form part of the TEN-T infrastructure network, both Core (2030) and Comprehensive (2050), and states under Article 12(2)(d), the following:

"Member States shall ensure that the railway infrastructure:

(d) save in the case of isolated networks, is fully electrified as regards line tracks and, to the extent necessary for electric train operations, as regards sidings;"

The DART+ Programme including the DART+ Coastal North project is consistent with the objectives of the Trans-European Transport Network. It will involve the creation of a rail mode transport which is cleaner and less dependent on oil, and more energy efficient. It will allow for more efficient transportation along the east coast of Ireland, and encourage greater use of public transportation, reducing the dependency on car-based commuting.

2.2.2.3 Sustainable and Smart Mobility Strategy

The Sustainable and Smart Mobility Strategy (European Commission 2020) sets out a number of goals as to how people will move within and between cities in the future. It has identified 82 initiatives which have been categorised into 10 'flagships'.

The flagship relevant to the DART+ Coastal North project is '*Flagship 3 – Making interurban and urban mobility more sustainable and healthy - for instance by doubling high-speed rail traffic and developing extra cycling infrastructure over the next 10 years.'*

The DART+ Coastal North project complies with this strategy as it ensures sustainable alignment in urban areas for planned growth with investment in infrastructure and the provision of employment, together with supporting amenities and services.

2.2.2.4 European Union (EU) Green Deal 2019

The EU Green Deal (European Commission 2019) sets out key policies aimed at cutting emissions and preserving the natural environment. A key component of the EU's Green Deal roadmap to transforming the EU's economy for a sustainable future is *'accelerating the shift to sustainable and smart mobility'.* It seeks to reduce the transport sectors greenhouse gas emissions by 90% by 2050.

The DART+ Coastal North project complies with this policy, in particular by reducing the greenhouse gas emissions produced by transport through the transition away from private cars to more sustainable public transport options.

2.2.3 National policy

2.2.3.1 Project Ireland 2040: National Planning Framework

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of the country by 2040.

There are 10 "National Strategic Outcomes" several of which are relevant to the Proposed Development:

1. Compact Growth
4. Sustainable Mobility
8. Transition to Low Carbon and Climate Resilient Society

One of the key growth enablers for the Dublin Region is identified as:

"Delivering the key rail projects set out in the Transport Strategy for the GDA including Metro Link, DART expansion and the Luas green line link to Metro Link."

The DART+ Coastal North project will contribute to the achievement of these outcomes and objectives. It will lead to more compact, railway-based growth along the railway line. It will encourage more sustainable commuting and contribute to a lower carbon environment. It will enhance the growth of the GDA in a more sustainable approach than one based on car transport. It is likely to alleviate pressure on Dublin City and create additional areas in the GDA along the route in which people can live and work.

2.2.3.2 National Development Plan 2021-2030

The current National Development Plan (NDP) sets out the ten-year capital investment ceilings which will support economic, social, environmental and cultural development across Ireland, incorporating a total public investment of €165 billion from 2021-2030. The NDP identifies the following relevant Strategic Investment Priorities and actions to help deliver the strategic outcomes of the NPF. Note that 'DART+ Expansion Programme' refers to the DART+ Programme.

NSO 2: Enhanced Regional Accessibility: *"Investment in the DART+ programme will address some of the constraints on the Dublin City Centre rail network and provide for additional services for intercity rail services."*

NSO 4: Sustainable Mobility: *"The DART+ programme will be a cornerstone of rail investment within the lifetime of Project Ireland 2040 and represents the single biggest investment in the Irish rail network."*

NSO 8: Transition to a Climate-Neutral and Climate Resilient Society: *"Delivering priority public transport programmes including BusConnects, DART+ Expansion Programme and MetroLink so that increased transport demand is met by greener public transport."*

These Strategic Investment Priorities have been influenced by the national objective of transitioning by 2050 to a competitive, low-carbon, climate-resilient and environmentally sustainable economy and society. As identified above, the DART+ Coastal North project will contribute to achieving these objectives.

2.2.3.3 National Sustainable Mobility Policy

The Department of Transport's National Sustainable Mobility Policy (NSMP) sets out a strategic framework to 2030 for active travel and public transport to support Irelands overall requirement to achieve a 51% reduction in carbon emissions by the end of this decade, targeting at least 500,000 additional daily active travel and public transport journeys by 2030. The policy is guided by three key principles of: Safe and Green Mobility, People Focused Mobility, and Better Integrated Mobility.

The DART+ Programme is specifically mentioned within the NSMP as being an important element for supporting Safe and Green Mobility. A key focus is the expansion of electrification and additional electric and battery-electric fleet for services to Drogheda.

The DART+ Coastal North project is in compliance with the NSMP and supports the goals through expansion of the electrified network to Drogheda. The DART+ Coastal North project will decarbonise public transport, promote the use of and expand the availability of sustainable mobility.

2.2.3.4 National Investment Framework for Transport in Ireland (December 2021)

The National Investment Framework for Transport in Ireland (NIFTI) is the Department of Transport's high-level strategic framework to support the consideration and prioritisation of future investment in land transport. It represents the Department's contribution to Project Ireland 2040, Government's long-term, overarching strategy to make Ireland a better country for all and to build a more sustainable future.

As part of NIFTI, a wide range of supporting analysis has been conducted to identify key transport challenges, needs and constraints, both today and in the future. In order to address the challenges identified in the supporting analysis, NIFTI establishes four Investment Priorities: Decarbonisation, Protection and Renewal, Mobility of People and Goods in Urban Areas, and Enhanced Regional and Rural Connectivity.

The DART + Coastal North project will comply with the Investment Priorities. It will assist in the decarbonisation of the transport system. It will help in the protection of the environment. It will improve the mobility of people in a sustainable manner. Finally, it will improve regional connectivity between Dublin, Meath and Louth counties.

2.2.3.5 Department of Transport: Statement of Strategy 2023-2025

This Statement of Strategy is the Department of Transports primary strategic plan and sets out key priorities for the period 2023- 2025. The high-level goals of the Department are:

- Connectivity;
- Sustainability: Economy, Environment and Society;
- Safety, Security and Accessibility;
- Effective Regulation;
- Stakeholder Engagement; and
- Organisational Excellence and Innovation

The Statement of Strategy specifically identifies the DART+ Coastal North project as a key strategic project for delivering "Strategic Goal 2: Sustainability: Economy, Environment and Society":

"Ensuring that our transport system is integrated, resilient and decarbonised in a manner that is environmentally, economically and socially sustainable:

We will… Accelerate modal shift to public transport, improving the transport choices available to people.

By… Continued progression of BusConnects, DART+ and MetroLink programmes"

2.2.3.6 Climate Action and Low Carbon Development (Amendment) Act 2021

The Climate Action and Low Carbon Development (Amendment) Act 2021 (Government of Ireland 2021) sets out the central objective relating to emission reductions. It legally binds Ireland to have net-zero emissions no later than 2050 and to a 51% reduction in emissions by the end of the decade (2030), against a base of 2018 emissions.

The DART+ Coastal North project would deliver infrastructure which will support a shift towards sustainable transport options that will in turn support the targets set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

2.2.3.7 Climate Action Plan 2024

The Climate Action Plan 2024 (CAP24) is the third annual update to Ireland's Climate Action Plan 2019. A draft of the Plan was agreed by the Government in December 2023 and, following the completion of Strategic Environmental Assessment, Appropriate Assessment, and a six-week public consultation, the finalised version of the CAP24 was approved by the Government on 21 May 2024. The plan implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve emissions by 2030 and to reach net zero no later than 2050, as committed to in the Programme for Government.

The Plan sets out a detailed sectoral roadmap designed to deliver a 51% reduction in greenhouse gas (GHG) emissions by 2030. CAP24 builds upon the previous CAP23 targets by outlining how Ireland will accelerate the actions required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development. CAP24 places more focus on high impact actions. A new Annex of Actions within CAP 24 includes the following high impact action of relevance to DART+ Coastal North:

TR/24/12(TF) Advance DART+ Programme *- Progressing appraisal and planning for DART+ Programme, including lodgement of railway order for DART+ Coastal North.*

The DART+ Coastal North project will be in compliance with, and will contribute towards, the targets identified in the Climate Action Plan. It will help reduce GHG emissions by:

- The provision of a more efficient public transport route, thereby encouraging a modal shift towards public transportation; and
- It will become part of the electrified rail network in Ireland.

The DART+ Coastal North project is part of the DART+ Programme which is identified as a specific action in the plan.

2.2.3.8 The White Paper, Ireland's Transition to a Low Carbon Energy Future 2015-2030

The White Paper, Ireland's Transition to a Low Carbon Energy Future 2015-2030 is a statement of Government policy in the energy sector. It sets out an energy policy framework up to 2030 and outlines a transition to a low carbon energy system for Ireland by 2050. The White Paper comprises of an energy policy update and provides the framework to guide national policy.

The DART+ Coastal North project will support and facilitate the shift to support energy efficient and renewable transport through encouraging modal shift towards lower energy intensive public transport, to support Ireland's climate ambitions and increase resilience to future climate change.

2.2.4 Regional policy

2.2.4.1 Eastern & Midland Regional Assembly, Regional Spatial and Economic Strategy 2019-2031

A Regional Spatial and Economic Strategy (RSES) is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives.

The RSES sets out sixteen Regional Strategic Outcomes, three of which are relevant to the DART+ Coastal North project: Sustainable Settlement Patterns, Compact Growth and Urban Regeneration, and Integrated Transport and Land Use.

The 'DART Expansion' – the previous name for the DART+ Programme - is heavily referenced and supported in the document, including in relation to the development of the Dublin Metropolitan Area, and Drogheda.

The DART+ Coastal North project will assist in the development of urban settlements along the Northern Line rail network, and also Drogheda as a destination in which to live and work in. It will encourage the development of underutilised zoned lands along the Northern Line rail network via provision of a more efficient public transport route. And it will assist in achieving a more balanced approach to the integration of transportation and development, both in terms of employment and residential locations.

2.2.4.2 Transport Strategy for the Greater Dublin Area 2022-2042

The Transport Strategy for the Greater Dublin Area 2022-2042, developed by the National Transport Authority (NTA) in 2021 was published in January 2023 and replaces the previous framework, titled the Transport Strategy for the Greater Dublin Area 2016- 2035, which was approved by the Minister for Transport, Tourism and Sport in 2016. The Strategy addresses the transportation requirements to support the continued co-ordinated development within the counties of Dublin, Meath, Kildare and Wicklow.

The DART+ Programme is referenced within the strategy as a major project, with various measures set out committing to its delivery. The DART+ Coastal North project is in accordance with all objectives of the Transport Strategy for the Greater Dublin Area and will support the achievement of these measures.

2.2.4.3 Integrated Implementation Plan 2019-2024

The NTA's Integrated Implementation Plan (IIP) 2019-2024 supports the delivery of the Transport Strategy for the Greater Dublin Area 2016-2035 and is aligned with the objectives of the NDP (both now updated). It sets out the central infrastructure investment programme and overall funding provision over the six-year period. It identifies the key investment areas with respect to bus, light rail, heavy rail and integration and sustainable transport investment.

The implementation of the "DART+ Programme" is identified as a key objective for rail investment within the IIP. The investment programme and overall funding provision of the Implementation Plan align with and support the DART+ Coastal North project, particularly in implementing the DART+ Programme, and improving safety and reliability.

2.2.1 Local policy

2.2.1.1 Dublin City Development Plan 2022-2028

The Dublin City Development Plan 2022-2028 was adopted by Dublin City Council on 2nd December 2022 and came in to effect on 14th December 2022. The Plan sets out how the city will develop to meet the needs of all residents, workers and visitors.

Policies within the plan promote sustainable urban neighbourhoods, low carbon transport modes, compact growth and transitioning to sustainable travel. Specifically, the Plan commits to working with IÉ to progress a coordinated approach to improving the rail network to ensure maximum public benefit and promoting sustainable transport and improved connectivity.

The DART+ Coastal North project is in alignment or is supported by policies within the plan. Where any sensitive zoning objectives, protected structures or amenity designations have been identified as being adjacent to or interacting with proposed works, these have been carefully considered in the design process.

Strategic Development Regeneration Area (SDRA) 1: Clongriffin/Belmayne and Environs is located within the works area at Clongriffin station.

The DART+ Coastal North project, including the rail enhancements at Clongriffin Railway Station, complements the aims and objectives of the SDRA enabling the development of a sustainable, mixed use urban quarter adjoining a high-quality public transport node. There are no objectives or designated areas within the SDRA that would be impacted by the DART+ Coastal North project.

2.2.1.2 Fingal Development Plan 2023-2029

The Fingal Development Plan 2023-2029 sets out the spatial framework to guide future development within the County with a focus on the places people live, work, visit and do business, and how people interact and move between these places while protecting the environment. At the core of the vision, a number of strategic objectives are supportive of the DART+ Coastal North Project:

"9. Reduce car dependency and promote and facilitate sustainable modes of transport. Prioritise walking, cycling and public transport, while supporting an efficient and effective transport system.

10. Protect, enhance and ensure the sustainable use of Fingal's key infrastructure, including water supplies and wastewater treatment facilities, energy supply including renewables, broadband and transportation."

The DART+ Coastal North project is in alignment or is supported by policies within the Fingal Development plan. Where any sensitive zoning objectives, protected structures or amenity designations have been identified as being adjacent to or interacting with proposed works, these have been carefully considered in the design process. Site specific and local objectives such as future cycle/pedestrian routes have also been taken into account.

Within the Fingal County Council there are also a number of Area Specific Plans which are relevant:

1. Baldoyle-Stapolin LAP (recently expired);
2. Portmarnock South Local Area Plan 2013 (recently expired); and
3. Donabate LAP 2016 (extended to March 2026).

The DART+ Coastal North project will help realise the visions and strategic directions of these Plans. The Proposed Development is complementary and supportive of all policies and objectives. All designated or sensitive areas relating to the natural or built environment have been considered in the optioneering and design of the DART+ Coastal North project, and mitigation measures have been proposed where there may be potential interaction.

2.2.1.3 Meath County Development Plan 2021-2027

The Meath County Development Plan 2021-2027 was adopted on 22nd September 2021 and came into effect on 3rd November 2021. It is a strategic aim of the Development Plan to create attractive efficient compact settlements which reduce the need to travel and improve the quality of life for inhabitants. Policies within the plan support compact settlements served by public transport and land use planning which encourages greater use of public transport.

The DART+ Coastal North project complies with the strategic vision and the specific policies of the Development Plan. Where any sensitive zoning objectives, protected structures or amenity designations have been identified as being adjacent to or interacting with proposed works, these have been carefully considered in the design process.

2.2.1.4 Louth County Development Plan 2021-2027

The Louth County Development Plan 2021-2027 was adopted on 30th September 2021. The Plan came into effect on 11th November 2021. The Louth County Development Plan 2021-2027 has superseded the Drogheda Borough Council Development Plan 2011-2017 and the North Drogheda and Environs Local Area Plan. A key priority of the plan is to promote the continued sustainable and compact growth of the town as a regional driver of city scale with a target population of 50,000 by 2031.

The plan recognises that the "DART Expansion Programme" is an important growth enabler for Drogheda as it would improve the connectivity to Dublin due to the increased frequency of services, making the town more accessible and attractive for economic investment and employment generating development.

Policies within the plan also support investment in public and sustainable transport infrastructure, as well as the integration of land use with sustainable transport to encourage a critical mass if population and employment. The Plan specifically commits to supporting electrification of the existing northern rail line to Drogheda.

The DART+ Coastal North project is in alignment or is supported by policies and zoning objectives within the plan. Where any protected structures have been identified as being adjacent to or interacting with proposed works, these have been carefully considered in the design process.

3. ALTERNATIVES

This section presents an overview of the reasonable alternatives studied during the development of the Proposed Development which have been informed by relevant policy/plans, previous studies and developed and refined as part of the ongoing design development and EIA process.

3.1 Option Selection Process

The Multi-Criteria Analysis (MCA) technique has been applied to inform the option selection process to determine the end to end preferred option for the Proposed Development. The MCA was informed by the Common Appraisal Framework (CAF) for Transport Projects and Programmes (Department of Transport Tourism and Sport, March 2016 and updated October 2020)[1]. The CAF Guidelines require projects to undergo an MCA under a common set of six CAF criteria referred to as parameters. These include:

- **Economy** relates to impacts of a transport investment on economic growth and competitiveness which are assessed under the economic impact and economic efficiency criteria;
- **Integration** considers the extent to which the Proposed Development being evaluated promotes integration of transport networks and is compatible with Government policies, including national spatial and planning policy;
- **Environment** embraces a range of impacts, such as emissions to air, noise, and ecological and architectural impacts;
- **Accessibility** and Social Inclusion embraces the notion that some priority should be given to benefits that accrue to those suffering from social deprivation, geographic isolation and mobility and sensory deprivation; and
- **Safety** is concerned with the impact of the investment on the number of transport related accidents; and Physical Activity relates to the health benefits derived from using different transport modes.

3.1.1 Criteria

The criteria and sub-criteria are the measures of performance by which the options were assessed. It is appropriate that the approach should reflect the Proposed Development objectives and the infrastructural element under consideration. The CAF was used as a basis to inform the development of the respective sub-criteria which were adapted based on the individual infrastructural components under examination. For example, Construction Compound sub-criteria may be different to the substations sub-criteria etc. and were amended in the respective MCA methodology as appropriate.

This approach allows for consistency but also appropriate flexibility in the approach to the options assessment process. In some cases, some criteria were scoped out – if they were not deemed relevant to the option assessment under examination.

[1] The CAF was replaced by the Transport Appraisal Framework (TAF) in June 2023, but was the relevant guidance in place at the time of the options assessment.

3.1.2 Comparative Assessment

The assessment undertaken is of a comparative nature (options compared against each other). This is based on the CAF criteria and based on professional judgement in respect of the items to be qualitatively evaluated, and comprehensively assessed against the key relevant criteria in accordance with CAF Guidelines and good industry practice.

The assessment compared the relevant options, identifying and summarising the comparative merits and disadvantages of each alternative under all the applicable criteria and sub-criteria leading to a Preferred Option.

A comparative assessment was undertaken for each option developed, where in general, for each positively scored option there must be an opposing negatively scored option. Table 3-1 provides an overview of the comparative colour coded scale for assessing the criteria and sub-criterion. For illustrative purposes, this scale is colour coded with advantageous options graded to 'dark green' and disadvantaged options graded to 'orange'.

Table 3-1 Comparative colour coded scale for assessing the CAF criteria and sub-criteria

Colour	Description
	Significant comparative advantage over all other options
	Some comparative advantage over all other options
	Comparable to all other options
	Some comparative disadvantage over all other options
	Significant comparative disadvantage over all other options

Stage 1

Stage 1 was a Preliminary Appraisal (sifting) carried out by the Project Design Team. It involved identifying a long list of high-level options for the key elements of the scheme including Do-Nothing, Do Minimum Option and Do Something Option(s).

The options were assessed against Engineering, Environment and Economy criteria. The Engineering criterion was judged as a 'pass' or 'fail' criterion in terms of whether an option was considered feasible and met the Project objectives and requirements or not. A pass/fail approach was not applied for Environment or Economy at the sifting stage.

For some design elements of the Proposed Development a Stage 1 assessment was sufficient and resulted in arriving at a preferred option.

Stage 2

In some cases, a more detailed multi-criteria analysis (MCA) was required. This is called a Stage 2 MCA. The Stage 2 MCA examined the shortlisted options from Stage 1 sifting in greater detail to determine a preferred option. The same general selection process was followed for both Stage 1 and Stage 2 MCAs. However, in the Stage 2 MCA additional design development / further studies and subsequently more detailed analysis / assessment was undertaken.

3.2 Overview of Alternatives Considered

The reasonable alternatives considered at option selection stage were framed within the following scenarios for each significant intervention required.

3.2.1 Do-Nothing

The Do Nothing scenario wherein the proposed interventions do not go ahead and therefore the capacity and potential of the public transport system remain restricted and the project objectives are not met.

3.2.2 Do-Minimum

The Do Minimum scenario wherein the proposed interventions go ahead but only those which can generally be met within the existing rail corridor. The Do Minimum scenario in this context is not passive, as some level of works and intervention is necessary to meet the Project objectives and requirements, albeit the least burdensome in terms of lands outside the rail corridor.

3.2.3 Do-Something

The Do Something scenario(s) wherein the proposed interventions go ahead but interventions are required beyond the existing railway corridor impacting on 3rd party / private lands at some locations.

3.2.4 Do-Something Preferred Option

The Do-Something "Preferred Option" is that option which best provides for the Proposed Development to go ahead and for the project objectives to be met while also minimising the impacts outside the rail corridor. The passenger capacity and frequency of trains is increased. The frequency and quality of service that will be provided will provide a viable transport alternative to communities along the route and help encourage people from private car use. Sustainable economic development and population growth is supported through the delivery of an efficient, sustainable, low carbon and climate resilient heavy rail network. Ireland's advancement towards a low emissions transport system and emission reduction targets are achieved.

3.2.5 Scope of Options Selection

Multiple options were considered and assessed using the methodology outlined above under each of the following key infrastructural elements of the Proposed Development:

- Works around bridge structures;
- Installation of power supply substations and electrical feeding infrastructure;
- Works around Drogheda MacBride Station;
- Works around Malahide Station;
- Works around Clongriffin Station;
- Works around Howth Junction & Donaghmede Station; and
- Depots.

Detailed assessment of alternatives led to the identification of the “Preferred Option” which was brought forward and developed and has been the subject of this Environmental Impact Assessment Report.

4. PROJECT DESCRIPTION

4.1 Description of Proposed DART+ Coastal North

4.1.1 Overview

The DART+ Coastal North project is the third infrastructure project to launch as part of the DART+ Programme. The extents of the DART+ Coastal North project is presented in Image 4-1.

The DART+ Coastal North project, 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. In addition, the DART+ Coastal North project requires that some track modifications are implemented, including the provision of turnback facilities at Drogheda, Malahide, Clongriffin, and Howth Junction & Donaghmede Stations. These modifications are essential to facilitate the increase in train services by improving operational flexibility, allowing trains to be turned back clear of continuing services and enabling a higher frequency and a more reliable service.

To achieve the peak capacity increases proposed by the DART+ Programme, the DART+ Coastal North project will seek a reconfiguration of Howth Junction & Donaghmede Station and the removal of train crossing conflicts at the station; these currently limit both capacity and frequency of services on the Northern and Howth Branch lines. The Proposed Development is seeking to deliver the infrastructure at Howth Junction & Donaghmede Station that could enable the operation of both a DART shuttle service on the Howth Branch line as required, and/or a direct through service to/from Dublin City Centre.

The majority of proposed works and interventions are expected to be carried out within the existing railway corridor boundary. Some works and interventions, however, will be required outside of the existing railway boundary for some project elements such as:

- bridge modifications/improvements to facilitate extended electrification;
- construction of substations (to facilitate the provision of power to the line); and
- use of land for temporary construction/storage compounds.

Through this project, IÉ is working to advance environmental sustainability by:

- decarbonising transport, ensuring climate change resilience,
- reducing our impact on the natural environment, and
- proactively protecting and enhancing biodiversity.

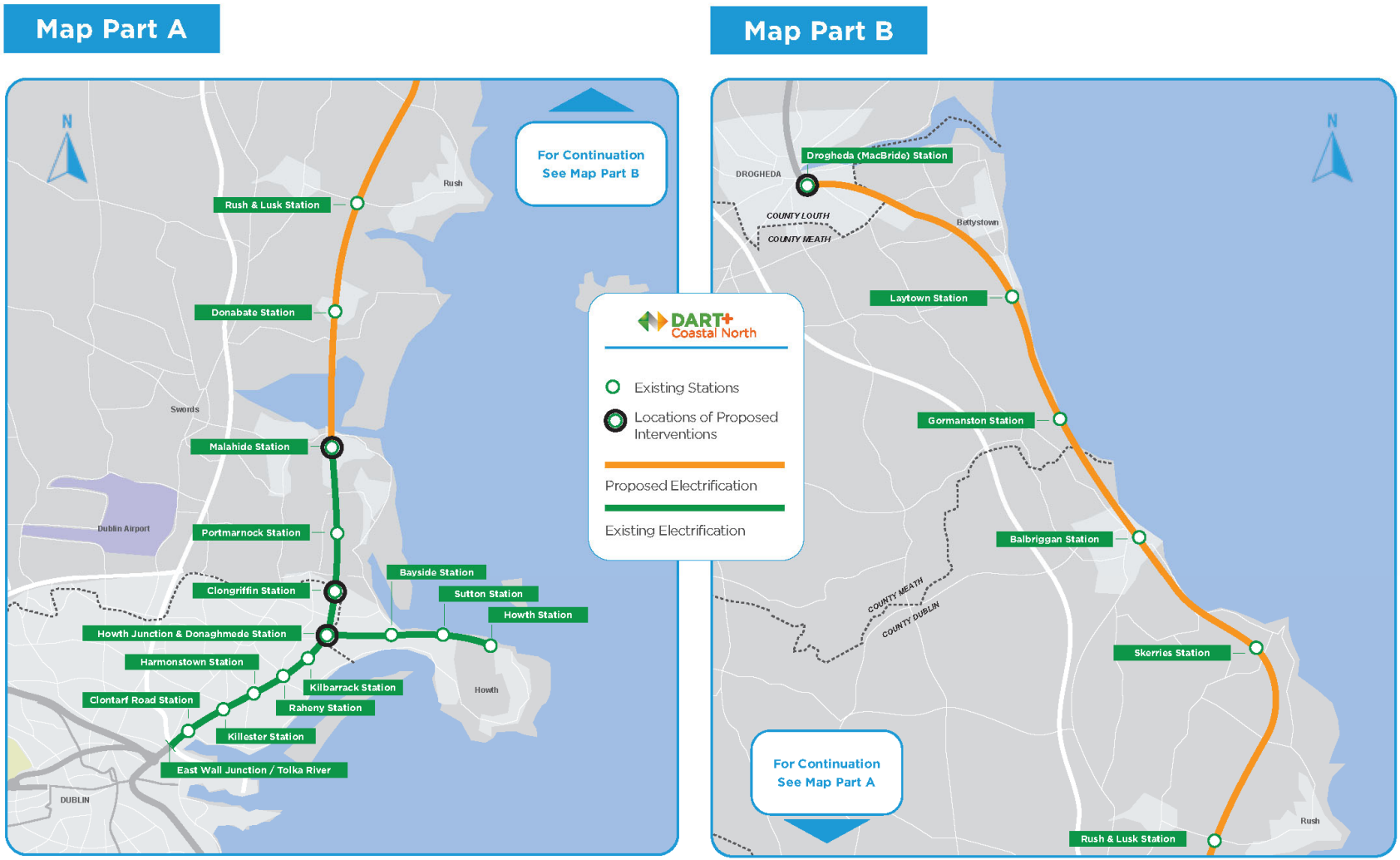


Image 4-1 Schematic of DART+ Coastal North

In advance of the changes that the DART+ Coastal North project will bring in respect of increased capacity and train frequency, IÉ plans to purchase Battery Electric Multiple Unit trains (BEMUs). The provision of these BEMUs will allow for the possibility of running enhanced services on the network in advance of full electrification. IÉ identified the Northern Line as the most suitable route for BEMU deployment, with Drogheda MacBride Station and depot area as the preferred charging location. These BEMU works will be delivered under a separate project in advance of the electrification under the DART+ Coastal North project.

4.1.2 Key Infrastructural components of DART+ Coastal North

The key infrastructural components of the DART+ Coastal North project include:

- Extension of existing 1500V DC electrification, which currently terminates at Malahide, as far as Drogheda MacBride Station (approximately 37km); this includes:
  - The installation of foundations, masts, and overhead wires to supply power to the railway;
  - Undertaking upgrades to existing signalling, telecoms, and power supplies to support the planned increase in train services, including the introduction of new electrical substations at key locations alongside the railway line at:
    - Drogheda;
    - Bettystown;
    - Gormanston;
    - Balbriggan;
    - Skerries North;
    - Skerries South;
    - Rush & Lusk (this location also incorporates an overhead line equipment (OHLE) maintenance compound); and
    - Donabate.
  - Undertaking improvements / modifications to bridges spanning the railway arising from track reconfigurations and / or meeting required electrical clearances;
  - Undertaking localised bridge modifications to enable OHLE to be fixed to bridges carrying the railway;
  - Canopy modifications at Drogheda MacBride Station to accommodate OHLE clearances; and
  - Modified railway boundary fences to protect the public from contacting the overhead line.
- Infrastructure works to facilitate the increase in service frequency and capacity, in specific areas of intervention as outlined below:
  - works around Howth Junction & Donaghmede Station;
  - works around Clongriffin Station;
  - works around Malahide Station & Viaduct;
  - works to the existing user worked level crossing (XB001) south of Donabate; and
  - works around Drogheda MacBride Station.
- Modifications to existing depots at Drogheda and Fairview to support the new train fleet, including the provision of additional train stabling at Drogheda; and
- Ancillary civils, utility diversions, drainage, and power work to cater for the changes.

4.2 DART+ Coastal North Design Elements

The Proposed Development will require modernisation and modifications to the existing railway line. A range of design elements, general linear works and ancillary works (drainage and utility diversions for example) are required along the entire length of the railway corridor to facilitate the electrification of the line and the upgrade of the existing network. Additionally, specific elements are required at specific locations along the route such as electrical substations to provide power to the network. The geographical extents of the Proposed Development have been divided into five zones (Zones A – E), with the works proposed within each zone explained further below.

4.2.1 DART+ Coastal North General Linear Works

4.2.1.1 Electrification: The Overhead Line Equipment System

The Overhead Line Equipment (OHLE) is formed primarily by two aerial electrical live wires (catenary and contact wire) located above the tracks which power the trains through the contact between a train's pantograph and the OHLE contact wire. Additional aerial earth and parallel feeder wires are also required to be installed along the track. The OHLE system is fed from new substations located along the line.

To support the OHLE wires, masts and other infrastructure will be erected along the line and through stations, from north of Malahide to Drogheda (including Drogheda Depot and part of Drogheda Freight Sidings). Typical spacing between OHLE support structures will be between 40m and 50m, with a maximum spacing of 65 m. The OHLE support heights will vary between 6.5m and 8.5m.

The OHLE support structure types will vary depending on the location and system requirements and consist of four different configurations; single-track cantilever, double-track cantilever, headspans and portal frames similar to examples present on the existing DART Lines.

4.2.1.2 Electrification: HV Power and Substations

HV (high voltage) power will be supplied to DART+ Coastal North from the ESB distribution network via new substations located at regular intervals between Malahide (the current extent of the electrified line) and Drogheda.

4.2.1.3 Substations

The required number and the location of these substations has been determined from a traction power simulation study which has established that eight new substations will be required between Malahide and Drogheda to supply power to the railway network. Substations are proposed at the following locations:

- Donabate;
- Rush & Lusk;
- South Skerries;
- North Skerries;
- Balbriggan;
- Gormanston;
- Bettystown; and
- Drogheda.

Electrical power from the ESB network will be supplied to the substations, and it will be converted from 38 kV to 1,500V direct current (DC) to power the overhead line electrical system.

The substations will be located within a secure compound, behind palisade fencing for security purposes. Where practicable, substations have been located within IÉ owned lands with screening vegetation proposed in front of the palisade fencing.

Key characteristics of the substations are as follows:

- Approximate substation building dimensions (including IÉ and ESB parts): 45m x 9m x 5m (length x width x height);
- The exterior and the access to the substations must be sufficiently illuminated to assure the mobility and the security of any operation during the night. Typically, the substation paths will be lit by pathway lighting and the buildings by use of low Lux level LED floodlighting mounted to the buildings and activated by motion sensors;
- An access road will be provided to allow for vehicle and pedestrian access to the building. The minimum road access width required by ESB is 4.5m. Parking spaces for each substation will also be provided; and
- The finish proposed for the substations is grey render on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations.

4.2.1.4 Signalling System

The signalling system operates to safely control the movement of railway traffic on the railway network. The existing railway incorporates signalling infrastructure along its length which includes underground cables, track level sensors and visible signals on posts or gantries that communicate instructions to the train drivers along the route.

As part of the Proposed Development, most of the existing signalling system will be progressively replaced with modern technology to achieve the more frequent train service. The proposed signalling system will incorporate similar components to those already in use on the DART network. This will include the provision of Signalling Equipment Buildings/Rooms (SEB/SER) and Location Cases (LOC) where required along the route in order to accommodate signalling equipment and associated power supplies and backup.

4.2.1.5 Telecommunications System and Equipment Buildings

Railway Telecommunications includes underground cabling, lineside Telecoms Location Cases (LOCs) located trackside and Telecoms Equipment Rooms (TERs) located at stations with the main communication devices. There will also be telecommunications system equipment located at existing and new Signalling Equipment Rooms / Buildings (SERs/SEBs) and Global System for Mobile Communications-Railway (GSM-R) buildings (BTSs).

There is an increased requirement for telecommunications systems capacity as part of the more comprehensive communication needs required for the DART+ Coastal North project, and therefore the existing telecommunications systems backbone must be upgraded as part of the Proposed Development.

This will be achieved by the provision of a new set of fibre optic cables stretching the length of the Northern Line. The new fibre optic cables will link the LOCs, TERs, SERs/SEBs and BTSs to the control centre.

In addition to the electrical buildings, equipment cabins are required to support the signalling and telecommunications infrastructure. These will be located within IÉ owned lands where possible. The standard types of cabins required along the Proposed Development include:

- Signalling Equipment Buildings (SEBs); and
- Telecommunications Equipment Rooms (TERs).

The equipment cabins are typically fenced-off for security behind standard IÉ palisade fencing. The approximate sizes of the different types of equipment cabins are detailed below:

- SEB size: 25.0m x 5.0m x 4.0m (length x width x height); and
- TER size: 10.0m x 4.0m x 4.0m (length x width x height).

4.2.1.6 Works to the Permanent Way (or track & railway corridor)

The term 'track work' encompasses the whole track system or 'permanent way' which consists of the rail, componentry, sleepers, ballast track formation, and associated lineside civil elements such as walkways, retaining walls, drainage, utilities, and fencing.

The Proposed Development requires the following track interventions:

- Four new turnback facility locations to satisfy the new operational model (referred to as the Train Service Specification or TSS);
- Associated modifications to the horizontal track geometry as a result of providing the turnback facilities, to provide the required space for the turnback facilities, the addition of new sidings and buffer stops, and to form connections to new platforms; and
- Localised interventions at four bridge locations to lower the existing track level (between 0.1 and 0.4 m) to achieve the required safe vertical clearance under the bridges for the Overhead Line Equipment (OHLE).

4.2.1.7 Bridges & Structures

For the DART+ Coastal North project, a variety of structures and structural interventions are proposed. Works related to the bridge and civil structures can be divided into the following types of intervention:

- Bridge modification/replacement;
- OHLE supports attached to viaducts;
- Bridge parapet modifications;
- Station access and footbridge modifications (at Howth Junction and Donaghmede Station in response to PC1 feedback);
- Station canopy modification (at Drogheda MacBride Station to provide safe electrical clearance); and
- New retaining structures.

4.2.1.8 Fencing and Boundary Walls

The electrified railway requires additional security measures to protect against trespass onto the Proposed Development. The existing fencing along the route will be assessed to ensure that adequate security measures are put in place to prevent unauthorised access to the railway infrastructure. Typical areas where secure fencing measures will be required are:

- Station modifications;
- SET buildings (Substation, TER; SEB, others);
- Depot locations; and
- Closed level crossings.

4.2.1.9 Station Modifications

The DART+ Coastal North project requires station modifications at the following existing stations to enhance their accessibility and connectivity, and also to facilitate capacity increases:

- Howth Junction & Donaghmede Station; and
- Drogheda MacBride Station.

Significant upgrades to Howth Junction & Donaghmede Station are proposed to provide a more accessible, user friendly and customer focused station for all rail users. This includes proposals to improve the connectivity between platforms between the Northern Line and the Howth Branch platforms to facilitate an increased frequency of stopping services.

At Drogheda MacBride Station it is proposed to install a new platform along the Drogheda Freight Sidings with a new train turnback facility to support the planned increase in train services. Modifications are proposed to the historic platform canopy at the station, and a replacement footbridge is proposed between platforms to provide the required clearance to OHLE infrastructure.

4.2.1.10 Depots

There are two existing depots within the scope of the DART+ Coastal North project located at Fairview and Drogheda. Modifications to the depots are required to provide the infrastructure and servicing facilities necessary to maintain the new DART fleet.

4.2.1.11 Other Ancillary Infrastructure

In addition to the General Linear Works there are several ancillary elements of infrastructure that enable the development. These include:

- Temporary Construction Compounds;
- Drainage; and
- Utility Diversions.

4.2.2 Zone A: North of Connolly Station to south of Howth Junction & Donaghmede Station

Zone A encompasses the area from the start of the Proposed Development, just north of Connolly Station to just south of Howth Junction & Donaghmede Station and includes Fairview Depot. This Zone lies wholly within the Dublin City Council administrative boundary, bordering the Fingal County Council boundary to the north.

There are no proposed modifications to permanent way, stations, bridges or structures, and there are no new substations proposed within this zone.

Minor modifications are required to the depot at Fairview to provide greater output of cleaning for the new trains. These modifications will include external civils works comprising the provision of new cleaning platforms on the sidings to the east side of the mainline, along with improvements to signalling, telecommunications, walkways, lighting, drainage and access.

4.2.3 Zone B: South of Howth Junction & Donaghmede Station to the north of Malahide Viaduct. (Including Howth Branch)

Zone B includes the area from south of Howth Junction & Donaghmede Station to just north of Malahide Viaduct (including user worked Level Crossing XB001) and also the whole of the Howth Branch line.

Zone B includes works within Howth Junction & Donaghmede Station, Clongriffin Station and between Malahide Station and a short distance north of the viaduct. Zone B lies wholly within the Fingal County Council administrative boundary, bordering the Dublin City Council administrative boundary to the south.

4.2.3.1 Permanent Way

Track modifications within Zone B are required to facilitate an increased frequency of train service, through provision of new turnback facilities with modifications taking place in the areas surrounding Malahide Station, Clongriffin Station and Howth Junction & Donaghmede Station.

4.2.3.2 Works at Howth Junction & Donaghmede Station

The DART+ Coastal North project is proposing significant modification works to Howth Junction & Donaghmede Station to both improve the passenger experience generally, and to develop the station to better serve as an interchange station. Proposed works will include:

- Extension to Platform 2
- Improvements to the footbridge and central connection
- Improvements to Ticket Hall and Station entrances.

Associated track modifications including the construction of a new crossover to the east of the platforms, and alterations to existing OHLE, signalling and telecoms will also be required.

4.2.3.3 Works at Clongriffin Station

To overcome the existing constraints, the proposed track work at Clongriffin Station includes the connection of a new enhanced speed passing loop on the east side of the station, named the ‘East Loop’ to accommodate the provision of a new turnback facility. New turnouts will also be installed to allow the opening of Platform 0.

To enable the new track configuration, works include the construction of a retaining structure to the east of the station, the extension of culvert UBB18B, and a new bridge adjacent to UBB19 to cross the Mayne River.

New OHLE and signalling installations, as well as modifications to the existing systems, will be required.

4.2.3.4 Works at Malahide Station

The proposed works will introduce a new pocket track between the Up and Down Line located along the southern causeway, in the area between the Strand Road underbridge (UBB29) and the Malahide Viaduct (UBB30). To facilitate the new turnback line the existing corridor needs to be widened to the west above the existing embankment. The works will include the construction of a new modular reinforced earth wall, and a modified earthworks embankment alongside the proposed Broadmeadow Way greenway. The existing OHLE and signalling systems will be modified with the installation of new OHLE and signalling assets beginning just south of the viaduct.

4.2.3.5 OHLE on Malahide Viaduct

Due to the length of the Underbridge UBB30 (Malahide Viaduct), OHLE masts need to be placed on the viaduct to support the overhead electrical wires. The proposed solution comprises a minimal intervention for supporting the masts on the bridge.

4.2.3.6 Donabate Level Crossing removal (XB001)

The DART+ Coastal North route has a single user-worked level crossing, located just north of the Malahide estuary and south of Donabate, (user worked level crossing XB001), connecting farmlands either side of the railway. Closure of the crossing is required as the Proposed Development will result in an increase in risk, both from the electrification of the railway line, as well as the increased frequency of trains.

4.2.3.7 Otter Crossing

A new otter crossing is to be provided immediately south of underbridge UBB31 carrying the railway over the River Pill, which will consist of a 600mm internal diameter pipe installed under the track. Otter proof fencing will be provided which will extend 100m beyond the proposed crossing (north and south) on both sides of the railway.

4.2.4 Zone C: North of Malahide viaduct to south of Gormanston Station (Fingal boundary)

Zone C encompasses the area just south of Donabate Station on the north side of Malahide Viaduct to south of Gormanston Station. The zone includes four stations at Donabate, Rush & Lusk, Skerries and Balbriggan. Zone C lies wholly within the Fingal County Council administrative boundary, bordering the Meath County boundary to the north.

4.2.4.1 Permanent Way

Track modifications within Zone C are required only for track lowering solutions. The three locations where track lowering is required, within this zone, are:

- Overbridge OBB39 (carrying Station Road / R128)
- Overbridge OBB44 (carrying local road in Tyrrelstown Big)
- Overbridge OBB55 (carrying Lawless Terrace / R127)

4.2.4.2 Interventions at Bridges and Structures

Zone C requires modification works to bridges in this area to accommodate the introduction of the OHLE equipment. This includes supporting OHLE masts on viaducts, lowering tracks to accommodate the passage of OHLE wires and modification of parapets to protect against electrocution risk. Specific interventions are:

- OHLE Masts on UBB36 (Rogerstown Viaduct) and UBB56 (Balbriggan Viaduct)
- Road overbridge parapet modifications for compliant safety standards to:
  - OBB32A (carrying the Donabate Distributor Road), OBB35 (access to Beaverstown Golf Club), OBB38 (carrying Rogerstown Lane), OBB41 (carrying local road in Rathartan), OBB46 (carrying the L1285 / Baldongan Close), OBB47 (historic access to Skerries Golf Club), OBB49 (carrying Golf Links Road), OBB55 (carrying Lawless Terrace / R127) and OBB68 (local access adjacent Gormanston Camp).
- Pedestrian footbridge parapet modifications for compliant safety standards to:
  - OBB33A (Donabate Station footbridge), OBB38A (Rush & Lusk Station footbridge), OBB51A (Skerries Station footbridge), OBB54 (The Ladies Stairs) and OBB57A (Balbriggan Station footbridge).

4.2.4.3 Proposed Substations

In Zone C there are five substations proposed with compounds to provide power to the network. These are located at:

- Donabate;
- Rush and Lusk;
- Skerries South;
- Skerries North; and
- Balbriggan;

4.2.4.4 Donabate Substation

The proposed substation at Donabate will be located to the west of the railway approximately 0.75km south of Donabate town. The area is outside of the IÉ land ownership boundary and hence property rights will be affected by the permanent works and permanent land acquisition will be required.

The finish proposed for the substation is a cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations. IÉ green palisade fencing will surround the site, providing security with the aid of a security gate at the entrance. A proposed hedgerow will provide screening for the fencing and building.

Vehicular access to the site will be provided through the existing hedgerow which bounds the railway line and the substation site. This will require the removal of a section of hedgerow and the provision of a security gate.

4.2.4.5 Rush & Lusk Substation & OHLE maintenance compound

The proposed substation will be located to the east of the railway and south-east of the car park for Rush and Lusk station. This substation site will also include an OHLE maintenance compound, which will comprise office space and welfare facilities, as well as external equipment storage areas.

A new access road to the east side of the Rush and Lusk station is also proposed. While the substation location is located on IÉ land, the new access to the station will require permanent land take outside of the IÉ land boundary.

The finish proposed for the compounds is a cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations.

The substation will be accessed via a new 5m wide road from the existing station car park. An entrance gate will be provided at the junction with the station car park, to provide appropriate security. Existing vegetation will be retained and utilised to screen both the proposed IÉ green palisade fencing and the substation building.

4.2.4.6 South Skerries Substation

The proposed South Skerries Substation is located east of the railway, approximately 1.1km south of Skerries Station. Permanent acquisition of third-party land will be required for the proposed substation as the proposed site does not sit within the existing IÉ property boundary.

The finish proposed for the substation is a cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations. The site will be surrounded by fencing which will provide a security barrier. The site perimeter will also be planted with a new hedgerow to provide appropriate screening.

Access to the proposed substation will be provided via a 45m long road from the Golf Links Road north of the site. The access road will be 5m wide.

4.2.4.7 North Skerries Substation

The proposed North Skerries Substation will be located south of the railway which runs in a northwest southeast direction in this location. The site is located approximately 2km northwest of Skerries Station. Access will share the existing farm access lane adjacent to the garden centre from Barnageeragh Road which runs along the north of the site. As the proposed site location does not sit within the existing IÉ property boundary, permanent land acquisition is required to accommodate the new substation.

The finish proposed for the substation is cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations. IÉ green palisade fencing and a planted hedgerow will surround the site, providing security and screening.

4.2.4.8 Balbriggan Substation

Balbriggan Substation is proposed to be located 1.48km northwest of Balbriggan Station. Permanent acquisition of third-party party lands will be required as the proposed site is not within the existing IÉ property boundary.

The finish proposed for the substation is cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations. It is proposed that IÉ green palisade fencing , along with a new planted hedgerow, will provide appropriate security and screening. Existing vegetation along the access road will also be retained.

A new vehicular access road is proposed from the R132 road which runs south of the site.

4.2.5 Zone D: South of Gormanston Station (Fingal border) to Louth/Meath border

Zone D encompasses the area between Gormanston Station and the Louth/Meath border (the Louth boundary is approximately 1.5km south of Drogheda MacBride Station). This zone includes Gormanston and Laytown Stations. Zone D lies wholly within the Meath County boundary, bordering Fingal to the south and Louth to the north.

There are no station modifications required in Zone D.

4.2.5.1 Permanent Way

Track modifications within Zone D are required on the vertical alignment (track lowering) under road bridge OBB78, carrying Colpe Road, to achieve safe OHLE wire Clearance.

4.2.5.2 Interventions at Bridges and Structures

Zone D requires some modification works to bridges to accommodate the introduction of the OHLE equipment. This includes the support of OHLE masts on Laytown Viaduct, track lowering at Overbridge OBB78 (carrying Colpe Road - as detailed above) and the following parapet modifications to existing bridges:

- Road overbridge parapet modifications for compliant safety standards to:
  - OBB68 (Local access adjacent Gormanston Camp)
  - OBB78 (Carrying Colpe Road)
- Pedestrian footbridge parapet modifications for compliant safety standards to:
  - OBB74A (Laytown Station footbridge)

4.2.5.3 Proposed Substations

In Zone D there are two substations proposed with compounds to provide power to the network. These are located at:

- Gormanston
- Bettystown

4.2.5.4 Gormanston Substation

The proposed site for Gormanston Substation is located at the northeast corner of Gormanston Camp airfield, which is located between the public road (Irishtown Road) and the camp wastewater treatment plant. The proposed site location does not sit within the existing IÉ property boundary, permanent land acquisition is required to accommodate the new substation.

The finish proposed for the substation is cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations. IÉ green palisade fencing will secure the substation and a newly planted hedgerow will screen the fencing and substation building.

A new vehicular access is proposed from the minor public road (Irishtown Road). This new access road will be typically 5m wide, with shared access gates to allow the Department of Defense to make use of the existing track.

4.2.5.5 Bettystown Substation

The proposed Bettystown Substation will be located to the north-east of the existing railway line, near the residential Ardmore Estate, approximately 2.12km northwest of Laytown Station. The proposed site location is not within the existing IÉ boundary. Permanent acquisition of third-party lands will be required for the substation.

The finish proposed for the substation is a cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing Iarnród Éireann substations. IÉ green palisade fencing around the site and a security gate at the site entrance will provide appropriate security for the site. A proposed hedgerow will screen the fencing and building.

Access to the substation will be provided from the existing Narroways Road to the north-west of the site, with a new 5m wide access road provided from the entrance off Narroways Road.

4.2.6 Zone E: Drogheda Station and surrounds (boundary of Louth approx. 1.5km southeast of Drogheda Station)

Zone E extends from the Louth/Meath border, approximately 1.5km south of Drogheda MacBride Station, to the end of the Proposed Development and encompasses Drogheda MacBride Station, including Drogheda Freight Sidings and the station surrounds. This zone lies wholly within the Louth County administrative boundary, bordering the Meath County administrative boundary to the south.

4.2.6.1 Permanent Way

Track modifications within Zone E are required in specific areas as outlined below:

- To connect to the new Drogheda MacBride Station Platform 4 (located on old freight sidings);
- New stabling sidings (7A & 7B) within the depot;
- Along the Drogheda Freight Sidings to create a new turnback facility;
- New stabling siding over UBK01 (located on the Drogheda Freight Sidings); and
- Under bridge OBB78 (track lowering).

4.2.6.2 Works at Drogheda MacBride Station

The works at Drogheda MacBride Station predominately relate to allowing a greater number of services to turn back at Drogheda to return to Dublin. A new Platform 4 is proposed to be located west of the main platforms on the Drogheda Freight Sidings. This new platform will extend over the Dublin Road Underbridge (UBK01), necessitating widening of the bridge. The new platform will be interconnected with the existing Platform 1 which will be modified to allow for pedestrian movements.

Sensitive restoration and cutback of the Platform 1 canopy (listed under Record of Protected Structures) is also required to provide clearance for new OHLE infrastructure and train exclusion zone.

4.2.6.3 Interventions at Bridges and Structures

Modifications to bridge and civil structures are required within Zone E to accommodate the works arising from the Proposed Development. This includes the reconstruction of Overbridges OBB80/80A/80B (carrying Railway Terrace), OBB81 (Drogheda Station footbridge), and Underbridge UBK01 (Dublin Road R132) as well as parapet modifications to Overbridge OBB81C (Drogheda Depot footbridge access).

4.2.6.4 Proposed substations

The location of the proposed Drogheda Substation is immediately north of the existing Drogheda Depot and within 0.2km of Drogheda MacBride Station. Access will be provided via a 5m wide road which will connect to the existing Drogheda Depot access road.

The finish proposed for the substation is cement rendered finish on all elevations with pressed metal roof sheeting, keeping the same architectural finishes as the existing IÉ substations. IÉ green palisade fencing will surround the site providing security, with a planted hedgerow providing screening from the north and west side of the site.

The proposed site location is not within the existing IÉ property boundary and therefore acquisition of third-party land will be necessary to accommodate the substation.

4.2.6.5 Works at Drogheda Depot

There will be localised modifications to the depot facilities at Drogheda MacBride Station to cater for the changes in rolling stock. These modifications are predominantly internal within the existing depot buildings, although some localised exterior changes to tracks and railway systems will also be required. Modifications proposed include:

- Additional Stabling lines 7A & 7B including provision for driver walkways and train cleaning;
- Modifications to the Under Train (Frame) Cleaning facility;
- Maintenance Building Door Modifications; and
- OHLE Fixings within and on the Maintenance Building.

4.2.7 DART+ Coastal North Operational Railway Characteristics

The DART+ Coastal North project will provide the infrastructure to enable improved performance and increased DART frequencies along the Northern and Howth Branch Lines, providing enhanced capacity from the city centre to and from both Drogheda and Howth. With the implementation of the DART+ Coastal North project, an enhanced level of maintenance is essential to operate a safe and reliable train service.

The operational railway in the DART+ Coastal North area will consist of new Electric Multiple Units (EMUs) interspersed by the Dublin-Belfast and Dublin-Dundalk services (Diesel or battery-electric trains). The new fleet will operate either as FLUs (Full length units or 10-car trains) with a length of 168m or during lower demand hours, as HLUs (Half Length Unit or 5-car trains). The EMU train fleet will continue to be stabled, serviced, and maintained at Fairview and Drogheda depots within the enhanced servicing facilities.

4.2.7.1 Operating Pattern and Indicative Train Service Specification

Operational analysis has been carried out for the DART+ Programme. Based on IÉ requirements, modelling was carried out for different options of train service specifications. The baseline scenario, preferred by IÉ, provides for an increased number of trains on each of the lines leading to the city centre area.

Where there are existing DART services, nine DART services will operate in each direction to Clongriffin, with seven in each direction continuing to Malahide. In peak hours, five DART services in each direction will extend north from the current terminus at Malahide to Drogheda MacBride Station. These will be accompanied by two DMU (Diesel Multiple Unit) commuter services per hour from Dublin Connolly to Dundalk in each direction, stopping at all stations. During the peak period the TSS accommodates a further one intercity Enterprise service in each direction per hour between Dublin Connolly and Belfast, stopping only at Drogheda MacBride and Dundalk stations between Dublin and the border.

Proposed changes to the Howth Branch line, as defined in the TSS, would enable a DART shuttle service between Howth Junction and Donaghmede and Howth stations, and/or a direct line service between Howth and Dublin City Centre and / or a DART shuttle service between Howth Junction and Donaghmede and Howth stations. This removal of crossing conflicts will enable an increased capacity and frequency of service to and from Howth, from the current three services an hour to a maximum of six services an hour during peak periods.

4.3 Maintenance Works

The railway infrastructure, the tracks and OHLE, require regular maintenance during night-time when the railway services are not in operation. These maintenance works generate noise that must be mitigated and monitored.

The DART+ Coastal North project does not involve substantial changes to existing track maintenance regimes, although extending the electrification of the line and operating a more intensive train service will require additional maintenance activity in the longer term.

5. CONSTRUCTION STRATEGY

5.1 Construction Programme

The overall Construction Phase of the Proposed Development is anticipated to be approximately 36 months. This construction programme has considered both efficiency in terms of phasing and duration as well as any measures needed to reduce the potential for environmental impacts.

A high-level indicative construction programme is set out in Image 5-1 identifying the key Construction Phases and the duration of same over the construction period. 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 Proposed Development.

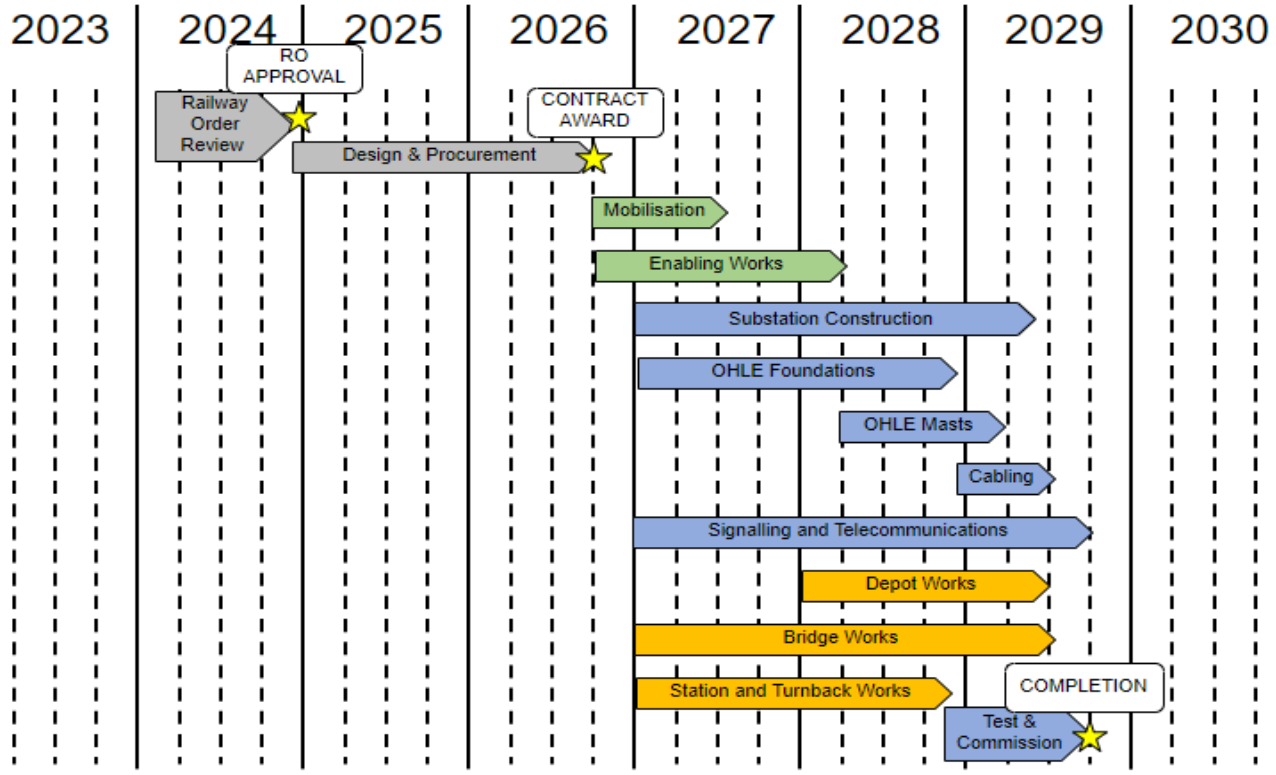


Image 5-1 High-Level Construction Programme

5.2 Construction Working Hours

A key consideration in the design of the construction strategy and programme is the requirement to reduce the impact on the operation of the railway line during construction 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 would require a temporary closure of a section of railway line (normally during night-time or weekends (termed night-time or weekend track possessions) to allow construction to proceed while limiting the impact on rail services.

The general construction hours proposed for the Proposed Development, particularly for works away from the immediate vicinity of railway line are:

- Monday to Friday: 07:00 to 19:00 (12 hours)
- Saturday: 07:00 to 13:00 (6 hours)
- Sunday: Only when agreed in advance with the local authority and IÉ.

Where required, track possession times vary across the route. Specific possession hours would be advised nearer the start of construction however, possible types of track possessions are noted in Table 5-1. 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.

Table 5-1 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 (e.g. October and Easter)	3-4 days, twice per year
Disruptive Full weekend (anticipated rarely)	52 hours / Saturday morning at 01:00 to Monday morning at 05:00
Disruptive Bank Holiday weekend (anticipated rarely except October and Easter)	72-76 hours / for example Saturday morning at 01:00 to Tuesday morning at 05:00
Disruptive Single Line working at weekends (anticipated rarely).	This may be feasible in specific locations, especially at Malahide, where design and logistics allow.

5.3 Preparatory Phase

Should the Railway Order be confirmed, a number of advanced works contracts will be required to facilitate construction. These include:

- Pre-construction Ecological Surveys: This phase of the construction stage will address any required pre-construction surveys including bat surveys, otter surveys and bird nesting surveys;
- Invasive Species Treatment and Management: Invasive species surveys have been undertaken as part of the Biodiversity assessment. Where identified, specific mitigation will be applied to ensure that appropriate management and control measures are enacted prior to works.
- Tree Surveys: Arboricultural Impact Assessment will be produced for the area of the Proposed Development, as well as for any adjoining areas where trees are likely to be impacted by the works.
- Archaeological Monitoring: Pre-construction archaeological surveys will be undertaken under Licence by the Department of Housing Local Government and Heritage prior to construction works commencing; and

- Vegetation Clearance: Prior to works commencing vegetation such as trees, climbing plants, shrubs or vines will be removed where required. Site clearance to remove any unwanted materials and equipment will also be required.

5.4 Construction Compounds

Construction Compounds will be required along the length of the scheme at specific locations. The location and function of the temporary Construction Compounds are summarised in Table 5-2.

Table 5-2 Proposed temporary Construction Compounds

Function	Location of proposed compounds
Line-wide / multi-discipline	Donabate Substation, Donabate Station, Rush and Lusk Station, Skerries, Balbriggan Substation, Laytown Substation, Drogheda OBB80 (North)
Stations	Howth Junction & Donaghmede Station, Clongriffin Station, & Drogheda MacBride Station
Track works	Howth Junction & Donaghmede Station, Malahide (various locations), Clongriffin Station & Drogheda MacBride Station
Structures / Bridges	Various
Substations / OHLE Compound*	Donabate, Rush and Lusk*, Skerries South, Skerries North, Balbriggan, Gormanston, Bettystown, Drogheda
Level Crossings	Donabate Farm – User worked crossing (XB001)
3rd Party UTX Compounds	Various
Depots	Drogheda MacBride Station Depot, Fairview Depot

The sites will variously be used to accommodate offices for the contractor and client teams, storage facilities, recycling facilities, parking for cars and plant and potentially fabrication areas. The compounds vary in size and are located as close as possible to the rail corridor and areas where significant works are to be undertaken. The compounds will typically consist of areas of hardstanding for vehicles and materials and the main sites will be fully serviced with electricity, water, sewerage and telecoms.

The compounds will be used to support earthworks, ecological clearances, enabling works, site clearance, utility diversions work, civil works, the demolition of bridges, OHLE, track installation, signalling and telecoms equipment and all ancillary works.

Each Construction Compound will require to remain operational for the duration of the works with which it is associated. This is dictated by the construction programme and varies for each compound, ranging from several months (in the case of the overbridge modifications) to three years (for instance, those servicing line wide works). There are some seasonal restrictions proposed in respect of compounds (Caves Strand for example in Malahide will only be utilised between the months of May to September) to mitigate against potential biodiversity impacts. While every effort has been made to contain the necessary works within existing IÉ owned lands, this has not always been possible. Where works are required outside of IÉ lands, lands required for Construction Compounds will typically be on a temporary acquisition basis.

5.5 Construction Environmental Management Plan (CEMP)

A Construction Environmental Management Plan (CEMP) has been prepared, presenting the approach and application of environmental management and mitigation for the Proposed Development's construction. The CEMP collates the construction stage mitigation from this EIAR and identifies the tasks and roles to deliver that mitigation. The appointed contractor(s) will take ownership of the CEMP once appointed and will have responsibility to deliver on the stated mitigation in this EIAR.

The implementation of the requirements of the CEMP will ensure that the Construction Phase of the Proposed Development is carried out following the commitments made by CIÉ/IÉ in the Railway Order application process for the Proposed Development and as required under the Railway Order. Once commenced, the CEMP is considered a living document that will be updated according to the Proposed Development's changing circumstances and reflect current construction activities while ensuring delivery of the mitigation measures conditioned as part of any Railway Order approval. The CEMP will be reviewed on an ongoing basis during the construction process and include information on the review procedures.

6. TRAFFIC AND TRANSPORTATION

6.1 Introduction

The assessment identifies and assesses the likely significant effects that the Proposed Development will have on traffic and transportation modes in the study area during the Construction and Operational Phases. The assessment considers the projected changes arising from the Proposed Development against a baseline in both the Construction and Operational Phases and draws conclusions about the relevance and significance of those changes in the context of current environmental guidance and policy. Potential effects are discussed, and mitigation measures are presented as appropriate.

The impacts of the Proposed Development were considered within a 5km area of the existing railway line from Drogheda to Dublin City Centre, including the Howth Branch Line.

The traffic and transportation assessment presents the findings from technical transport planning and transport assessment methods, that determines how an effect is expected to occur as a result of the Proposed Development. The traffic and transportation impacts have been broken down into the following assessment topics for both the Construction and Operational Phases:

- Establishing baseline conditions, including traffic, pedestrian, cyclist, and public transport user flows and the facilities provided for each mode across the study area.
- Determining the potential effects of the construction of the scheme on traffic flows, pedestrians, cyclists, public transport users as well as junctions and roads within the study area, as this is potentially a very disruptive period for existing users, although temporary in duration.
- Determining the potential effects of the operation of the enhanced line and the increase closure durations of the level crossings on traffic flows, pedestrians, cyclists, public transport users as well as junctions and roads, which are the longer-term impacts of the DART+ Coastal North project.
- Determining the mitigation measures that are possible and may be required during construction and Operational Phases, while also identifying any residual impacts, and their significance.

The methodology used when assessing the potential magnitude of impacts of the Proposed Development on Vehicle Travellers, Pedestrians and Cyclists and Public Transport Users is based on guidance as published by the Environmental Protection Agency (EPA).

6.2 Receiving Environment

The proposed DART+ Coastal North project benefits from being located in a corridor of high population density, especially along the southern section. Those stations located along the north of the Proposed Development capture those travelling from the wider areas of North County Dublin, Co. Meath and Co. Louth to Dublin City Centre, enabling much-needed modal shift from the private car by providing a high-quality frequent alternative mode.

The existing railway line forms part of the mainline rail network connecting Dublin to Belfast. Diesel powered intercity and commuter trains and electric DART services currently operate on the existing rail line. There are currently 19 existing stations located along the length of the Proposed Development. Car parking / Park and Ride facilities are provided at a number of the train stations along the line.

There is a comprehensive road network in the study area and in the immediate vicinity of the railway line, particularly to the south and north there is a dense road network.

There are existing pedestrian and cyclist routes located within the study area which link to the wider network and facilitate pedestrian and bicycle movement. Dedicated cycle / pedestrian facilities are generally not provided on more rural roads, while in more urban areas such facilities are provided although dedicated lanes are not always available.

There are a large number of bus services operating within the study area and many bus stops within walking distance of train stations.

There are a number of vehicular and pedestrian crossings along the length of the railway line which are generally provided in the form of bridges. There are five ‘at grade’ crossings of the railway line along the extent of the Proposed Development i.e. five level crossings. One of these “at-grade” crossing is a user worked level crossing South of Donabate to access private lands.

Without the Proposed Development, it is expected that there will continue to be a high level of private motor vehicle transport reliance and there will be no significant increase in rail transport mode share. Any increase in private motor vehicle transport will further increase road congestion and can be expected to impact negatively on journey time for both private and public road transport.

6.3 Potential Impacts and Mitigation Measures

For the Construction Phase temporary traffic management arrangements will be prepared in accordance with Department of Transport’s ‘Traffic Signs Manual’. Measures to minimise the impacts associated with the Construction Phase will be implemented. A Construction Stage Mobility Management Plan, as described in the CEMP, will be prepared by the appointed contractor to encourage its personnel to travel to site by sustainable modes. A Construction Traffic Management Plan (CTMP) is included as part of the CEMP.

The assessment concluded that the impact of construction trips on the road network during the Construction Phase will mostly be negative, not significant / slight effect and short-term / temporary. However, in the area south of Gormanston to Louth/Meath border (Zone D) and at Drogheda MacBride Station and surrounds (Zone E) the impact of construction trips on the road network during the Construction Phase will be negative, moderate and short-term. The implementation of the CTMP and Mobility Management Plan will mitigate against this impact.

During the Construction Phase the effect of the temporary partial road closures on road transport will be a negative, slight, temporary effect. 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: partial road closures and some full road closures limited to weekends of Dublin Road (R132) and diversion of bus routes.

In addition, the effect of the temporary full road closure on road transport will be a negative, significant, temporary effect at Drogheda where a full road closure of Railway Terrace will be required. Alternative routes are being proposes and the reopening of the facilities will be prioritised as quickly as possible to mitigate against this impact.

The impact on car parking during the Construction Phase will be a negative, moderate effect, of short-term duration at Howth Junction and Donaghmede Station. At Donabate, Rush and Lusk and Drogheda MacBride Station the impact will be a neutral, slight effect of short-term duration following implementation of mitigation measures. Car parking will be returned to use as soon as possible once works are completed and safe to do so to mitigate against this impact.

The effect of the temporary track possessions during the Construction Phase on rail transport, where required, can be classified as negative, not significant or slight, temporary effects. Replacement rail services will be provided to mitigate any impact.

Bus routes at Drogheda will be impacted during the Construction Phase of the Dublin Road Bridge. These impacts are considered a negative, slight and temporary effect as require bus routes will be diverted and temporary bus stops to be used to mitigate against this impact.

A considerable number of detailed transport models exist for the study area, and the transport assessment of the Operational Phase utilised this detailed data and includes those junctions and road links along the length of the railway line. These models allow the dynamic redistribution of vehicles during the peak hours without and with the Proposed Development in place in order for the impact to be captured, measured and mitigated against.

During the Operational Phase the impact on traffic and transportation from mode choice due to the improvement of the rail service will be a positive, moderate, medium-term effect.

During the Operational Phase, the impacts on traffic and transportation in respect of route choice and overall network performance due to the improvement of the rail service will be a neutral, imperceptible, medium-term effect.

The increased level crossing closure frequency and duration during the Operational Phase will result in a neutral, imperceptible and medium-term effect on route choice and local area network performance. The effect on journey time is a neutral, imperceptible, medium-term effect. The effect on route choice and junction performance at most junctions is a neutral, imperceptible, medium-term effect; and occasionally could be a negative, slight / moderate, medium-term effect.

At a localised level the effect of the increase level crossing closure times during the Operational Phase on queueing for private cars and public transport at the four level crossings along the Howth branch was assessed. It was concluded that the impact on queueing would be a negative, moderate, medium-term effect on the whole. However, on highly trafficked days, for example during the summer months, long queues are more likely to form / 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. Yellow box markings will be provided at the Dublin Road & Sutton Road junctions to mitigate against this effect. In addition, sustainable transport will be promoted to mitigate against this effect.

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

The effect of the Proposed Development on traffic and transportation during the Operational Phase 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.

During the Operational Phase the only permanent loss of parking will be at Rush and Lusk station where 10 car parking spaces will be removed. Car parking utilisation has been observed to be low at the station. 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. Sustainable transport will be promoted to mitigate against this 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.

6.4 Residual Effects

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.

Following opening, the Proposed Development will provide more frequent and better levels of service with greater capacity to cater for the additional demand provided for those within walking, cycling and public transport distance of the DART+ Coastal North project, while also capturing those who travel from the wider catchment into the city centre. Overall, the Operational Phase will result in localised, neutral to slight /moderate negative effects. Moderate negative effects or significant negative effects (during summer months) are expected in terms of increased queuing and delay at level crossings which may impact pedestrians, cyclists, bus services and private cars. Sustainable transport will be promoted to mitigate against this effect. In addition, yellow box markings will be provided at the Dublin Road & Sutton Road junctions to manage long queues/ traffic blocking back.

7. POPULATION

7.1 Introduction

The assessment identifies and assesses the likely significant effects that the Proposed Development will have on the population in the study area during the Construction and Operational Phases. The assessment includes that of land use change and impacts on journey characteristics and journey amenity; general amenity and community infrastructure; community severance; and economic activity, including tourism and employment. The assessment has been undertaken by means of desktop studies including a demographic analysis, visits to the study area, and feedback from consultations. It addresses impacts at a community level rather than for individuals or identifiable properties, although population effects for individual properties are discussed where these are significant and/or located close to the Proposed Development. The assessment adheres to the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

7.2 Receiving Environment

Within the study area, Irish Rail's Northern Line connects Connolly Station with the suburbs of north-east Dublin and the towns of Malahide, Donabate, Skerries, Balbriggan, Laytown and Drogheda. The Howth Branch connects the suburbs of Howth, Sutton and Baldoyle with the Northern Line at Howth and Donaghmede Junction. The current DART service extends to Malahide and Howth. Land use within the Dublin area and towns along the line is primarily mixed use or residential with a high density of community facilities. The character of these areas is largely suburban north of Fairview but contains areas of higher density residential housing or apartment use such as at Donaghmede and Clongriffin. To the immediate north and east of Howth and Donaghmede Junction, there is a high concentration of industrial and commercial use. The study area also contains extensive rural or semi-rural areas and destinations of amenity value due largely to the proximity of the line to the coast. Howth, Malahide, Laytown and Skerries are important tourism destinations.

The catchment has a population of over 300,000 of whom over 160,000 live north of the existing terminus of the DART service at Malahide. This population has increased by nearly 10% since 2016. In Electoral Divisions, such as St Mary's in north County Meath, the population has increased by over 38%, while that of Donabate has increased by over 24%. Much new apartment development is underway or proposed in other locations such as Clongriffin. The catchment has a large number of commuters who travel into Dublin for work or college on a daily basis. Almost 50% of these commuters currently travel by private vehicle. Outside of Dublin, the proportion travelling by train averages 8%, although this figure is higher in locations where the local station is more central to an urban population such as Donabate where train accounts for 19.6% of journeys. It is intended that the Proposed Development will provide for more frequent services and much improved capacity between Dublin and Drogheda and that this will attract more people to use the train for commuting and for other journeys. In Howth, 15% of commuting journeys are currently by train, but the proposed doubling of services is likely to increase the proportion.

7.3 Potential Impacts and Mitigation Measures

The Proposed Development will entail works within the railway corridor that will include installation of trackside overhead line equipment (OHLE) and electrical traction substations, enhancement of signalling and telecommunications equipment, and modification of depot capacity and track, including new turnback facilities, track lowering and other changes to geometry. Temporary Construction Compounds will be needed along with associated access, although some new access will be retained permanently. Much of this work will be short-term in duration, sometimes over just a weekend or two. It will involve impacts from noise and lighting which are relevant as environmental effects on general amenity where works occur close to residential areas or to community facilities, for example at Clongriffin, Skerries North, Malahide and Laytown. Construction vehicle movement could also bring HGVs into the vicinity of community facilities such as schools and places where people live, shop or recreate.

Modifications of access or other works at stations and bridges will involve a longer period of environmental impacts and construction vehicle movement, sometimes with significant effects on the General Amenity of nearby communities and sensitive population subsets. Such works are envisaged at Howth and Donaghmede Junction, Clongriffin and Dundalk. Works on bridges include the raising or replacement of parapets which will be short term, but also the reconstruction of bridges in Drogheda which, though temporary, will involve environmental impacts occurring over a period of up to eighteen months, affecting the General Amenity of local residents. Bridge works will involve use of contraflows and both short and longer term traffic diversions with effects on Journey Amenity.

There are potential negative cumulative effects in relation to the construction traffic associated with larger housing and apartment developments, for example in Clongriffin, but only should construction commence at the same time as that for the Proposed Development. There are also potential cumulative effects in relation to works on the pedestrian and cycle bridge to be attached to the existing rail bridge at Malahide as part of the planned Broadmeadow Way greenway.

On operation, very significant or profound positive effects on journey characteristics will be realised by all passengers, and especially by commuters for whom journey time reliability is most important. The proposed introduction of a shuttle service on the Howth Branch will present inconvenience to some passengers where there is a need to change to mainline services, but the effect on journey amenity will be minimised by the proposed extension of the platform at Howth Junction and Donaghmede Station. For passengers on the Howth Branch, the net effect will still be positive due to the increased frequency of services. The unavoidable increase in the frequency of level crossing closures will have a slight effect in increasing the wait duration when barriers are closed but is projected to lead to a slight reduction in traffic queues specifically at the Sutton crossing where tailbacks from the Sutton Cross road junction occur frequently, particularly on summer weekends.

Mitigation is proposed principally for the Construction Phase to reduce the impact of construction traffic in locations such as Donaghmede, Portmarnock, Skerries by directing vehicles away from residential areas or by minimising the effect of community severance in terms of access to community facilities on roads which are likely to be used by either construction traffic, such as in Malahide and Balbriggan, or for diversions during bridge works in Drogheda.

7.4 Residual Effects

Most of the negative residual effects are released by residences, businesses and community facilities which are located close to the railway line where works are proposed. These effects are principally environmental in nature, for example due to noise and vibration, or construction traffic. However, these works will be finite in duration and often very short-term. The more significant residual effects are likely in the vicinity of stations at Howth Junction and Donaghmede, Clongriffin, Malahide and Drogheda.

On operation, the Proposed Development will have provided track improvements and electrification of the Northern Line to Drogheda MacBride Station. This will permit an extension of the DART service north of Malahide and an increase in the frequency and capacity of services making rail a more attractive choice for people living between County Dublin and County Louth. In addition, the Proposed Development will have provided for a doubling of services to Howth, increasing service frequency and reliability for people in Baldoyle, Sutton and Howth. The Proposed Development will have wider public good and economic benefits in terms of offering an alternative to the current high reliance on private vehicles.

The Proposed Development will result a significant positive effect for businesses in terms of the ability to recruit employees from a larger catchment, and for employees who will be able to find satisfying employment across a larger area. These positive effects extend to wider economic benefits, including a positive economic contribution from aggregate journey time savings and the combined effect of improved competitiveness, productivity gains and increased labour force participation from the ability of people to access more productive and rewarding employment. There will also be positive effects for tourism due to the improved frequency of services to destinations such as Howth and Malahide, and the easier ability to access locations such as Balbriggan and Laytown.

The development will present an opportunity to encourage a modal shift from private vehicles to public transport with further potential benefits for spatial planning, land use and compact growth around public transport nodes. Improved accessibility will permit, in some cases, new built development and new local opportunities for economic growth as well as having a positive dividend for quality of life if combined with traffic management measures including the infrastructure for active travel. Any modal shift will have positive effects for environmental quality from improved air quality and a more congenial environment for pedestrians and cyclists. There are specific positive cumulative effects in relation to use of the proposed BusConnects Clongriffin to City Centre Scheme and for the Broadmeadow Way greenway connecting Malahide and Newbridge Demesne and Donabate.

8. BIODIVERSITY

8.1 Introduction

The biodiversity assessment considered the potential impacts of the Proposed Development on biodiversity. The Assessment involved a review of available published data to identify any features of ecological value and field surveys of habitats, bats, terrestrial mammals, and wintering and breeding birds.

8.2 Receiving Environment

The receiving environment includes the existing railway corridor, beginning in Dublin City centre just north of Connolly Station and ending at Drogheda MacBride Station. The Proposed Development passes through a variety of habitats including both urban and rural areas. The existing railway corridor currently includes a mixture of unmanaged grassy verges, hedgerows, treelines, and scrub. the surrounding areas are made up of a mixture of agricultural farmland, residential and other urban areas, golf courses, estuaries, and coastal and intertidal habitats. Other habitats in the surrounding environment include watercourses, estuaries, streams, drains and ditches. A number of these watercourses are designated for nature conservation.

The Proposed Development overlaps with five European designated sites -

- Malahide Estuary SAC and Malahide Estuary SPA where the existing Malahide Viaduct traverses Malahide Estuary;
- Rogerstown Estuary SAC and Rogerstown Estuary SPA where the existing Rogerstown Viaduct traverses Rogerstown Estuary; and
- River Nanny Estuary and Shore SPA where the existing Laytown Viaduct traverses the River Nanny Estuary.

The Proposed Development does not overlap with any other European sites. The next closest European designated site is the North-West Irish Sea SPA, which is located c. 10m east of the Proposed Development Boundary.

8.3 Potential Impacts and Mitigation Measures

The potential impacts on biodiversity assessed for the Construction Phase include:

- Habitat loss and fragmentation – in general there will be very little habitat loss as a result of the Proposed Development due to the majority of works taking place within the existing railway corridor. Habitat loss will occur mostly in areas where Construction Compounds, substation compounds, access routes, track-lowering, and utilities are proposed.
- Habitat degradation / effects as a result of hydrological impacts – surface water run-off and discharges from the Proposed Development will drain into the existing local surface water drainage network. in the absence of mitigation measures, due to the proximity of surface water features to the Proposed Development, the associated effects of a reduction of surface water quality could extend downstream for a considerable distance from the discharge point or from the location of a pollution event, resulting in an undermining of the conservation objectives of the European sites in the vicinity of the Proposed Development.

Mitigation measures to prevent such a case include a Surface Water Management Plan which is included as part of the Construction Environmental Management Plan (CEMP). Specific measures include - Requirement for a Pollution Incident Response Plan, Construction Compound Management Plan, control of sediments, use of concrete, and management of vehicles. Specific mitigation measures include but are not limited to - avoidance of works in sensitive areas, working during dry seasons in flood prone areas, work areas being kept dry at all times through use of bunds of non-erodible material, use of settlement tanks and silt traps to remove silt from run off, designated refuelling areas for plant, machinery and vehicles, avoidance of high flood risk areas or Construction Compounds, and management of construction materials to minimise risk posed to aquatic environment.

- Habitat degradation as a result of introducing / spreading non-native invasive species – There is potential for non-native invasive species to be spread or be introduced resulting in the degradation of habitat areas of European sites in the vicinity and the undermining of conservation objectives associated with these sites. Mitigation measures to be implemented include a confirmatory pre-construction non-native invasive species survey to confirm presence/absence and extent of all Third Schedule non-native invasive species within the footprint. The invasive species management plan will then be updated and all control measures within the management plan will be implemented by a suitably qualified and licensed specialist prior to construction of the Proposed Development.
- Disturbance/displacement – construction related disturbance and displacement of fauna species could potentially occur within the vicinity of the Proposed Development. Piling works close to watercourses could potentially displace and/or disturb otter in watercourses known to support populations. This has the potential to undermine the conservation objectives of the River Boyne and River Blackwater SAC. Bird species that are designated for European sites in the vicinity of the Proposed Development and that forage inland are at risk of disturbance and displacement during construction. Noise levels associated with construction activity are expected to be within the range that would provoke a moderate effect of response from birds – i.e. birds becoming alert and reduction in feeding activity. NTA/IE will ensure a pre-construction confirmatory check of suitable otter habitat. Any new holt or couch sites identified will be protected in accordance with the appropriate guidelines. To minimise disturbance or displacement of bird species from noise activities, noise shall be tempered in noise generating equipment by use of noise restrictors for use in urban areas. Equipment shall also be sited in such a way that noise baffling screening can be used to reduce noise spill.
- Habitat degradation – air quality – a reduction in air quality in the immediate vicinity may occur due to dust deposition from construction activities. These effects include a reduction in photosynthesis due to dust smothering and chemical changes in plants such as acidity in soils. The likely effects associated with Construction Phase dust emissions pre-mitigation are overall negative, moderate and short term. Mitigation measures include standard measures to control dust such as inspection and cleaning of public roads, stockpiling of materials within Construction Compounds, water misting and spraying, vehicle coverings, and hoarding around the Construction Compounds.

The potential impacts on biodiversity assessed for the Operational Phase include:

- Habitat loss and fragmentation – due to the operation of the newly electrified DART+ between Malahide and Drogheda, there will not be any requirement to carry out works in any European site that would result in habitat loss or fragmentation impacts on SCI or QI species as a result of the Operational Phase of the Proposed Development.

- Habitat degradation – surface water – The hydrological connection between the Proposed Development and a number of European Designated Sites means there is potential for release of contaminated surface water run-off and / or an accidental spillage or pollution event into any surface water feature during Operational Phase. This has the potential to affect water quality in the receiving aquatic environment and undermine the conservation objectives of the associated European Designated sites. A combination of measures such as on-going maintenance to the railway and substations and the implementation of flood risk management operational procedures will be taken to ensure no additional risks to waterbodies will be encountered.
- Habitat degradation – invasive species – Once the Proposed Development is in operation, and in the absence of any required management during the Construction Phase, which might extend into the Operational Phase depending on the method of eradication used, IÉ will implement a maintenance and management regime subject to their current management procedures for trackway maintenance, where any introduction of non-native invasive plant species are managed, across their assets or the ongoing control and management of invasive species on their network.
- Disturbance/displacement – Excess light spill from the Proposed Development may result in avoidance behaviour from bats within the vicinity of the Proposed Development. Where possible operational lighting will be kept to a minimum and PIR lighting used. No significant potential impacts were identified for disturbance and / or displacement for any other species during Operational Phase.
- Direct injury/mortality – A potential increase in the mortality and/or direct injury risk to SCI species associated with increased collisions arising from the introduction of proposed new OHLE on the railway line in the Malahide, Rogerstown, and River Nanny Estuaries has been considered. As the current railway line has currently no overhead lines, areas that are exposed (i.e., are not screened by vegetation and/or the railway is in line with or above the surrounding landscape and therefore exposed) and have suitable wintering bird habitat and ex-situ habitat have also been considered in terms of potential collision risks to SCI species. This is namely at Gormanston, Balbriggan, and Laytown. Mitigation measures to ensure there are no significant impacts on birds species from direct injury/mortality include the use of hanging tabs along the OHLE for areas that are high risk to bird species, as mentioned above. Hanging devices (e.g. Raptor Clamp Diverter, Fire Fly) are suspended from the wire with fixed or swinging plates or flappers and are designed to increase the visibility of overhead lines and reduce the incidence of bird collisions with overhead cables.

8.4 Residual Effects

Following the Full implementation of the mitigation measures outlined in Section 8.9 of the EIAR Biodiversity Chapter, the Proposed Development will not result in any significant residual effects during the construction or Operational Phase.

9. LAND AND SOILS

9.1 Introduction

The land and soils assessment considers the likely significant impacts with regards to land and soils associated with both the Construction and Operational Phases of the Proposed Development. 'Land' in the context of this chapter refers to the existing soil and geological characteristics of the receiving environment.

As the Proposed Development relates to the upgrade and expansion of existing rail infrastructure, the study area is taken as no more than a 100m wide corridor along most of the existing railway lands.

Site walkovers and inspections were carried out by Arup along the Proposed Development in both trackside and off-track locations including during the site-specific ground investigations. Existing information such as mapping and aerial photographs were used during initial desktop studies to plan the ground investigations. Sources of historical information, geological maps and/or features had been established during the geotechnical desktop study of the area including a review of information from various previous projects and site developments.

A project specific ground investigation was undertaken from July 2022 to June 2023 with the purpose of verifying data already collected relating to the baseline environment. Various intrusive ground investigation techniques including boreholes, rotary boreholes, and trial pits were used to determine the soil, bedrock, and groundwater conditions, and to establish the environmental condition of the soil.

9.2 Receiving Environment

The Proposed Development begins to the north of Connolly Station in Dublin and ends to the north of Drogheda's McBride Station. The area is synonymous with the construction of the Dublin to Drogheda Railway in the mid-1800s, and the Dublin Port Tunnel in the early 2000s. The Dublin region in particular underwent significant urban development during the 20th Century with large scale residential, industrial, and commercial developments along the railway line stretching as far north as Malahide. North of Malahide, the railway line is predominantly surrounded by agricultural land with urban developments at Donabate, Skerries, Balbriggan, Laytown, Bettystown and Drogheda.

The topography of the region is characterised by relatively low-lying, gently undulating lands. There are localised elevated areas across the region generally synonymous with bedrock at or near the surface.

The soil type is variable across the region. Made ground associated with urban centres is common across the region. South of Lusk in north County Dublin, the main soil types include well drained mineral soils derived from basic parent material of varying thickness. Further north, the main soil types include well drained mineral soils derived from acidic parent material of varying thickness. There are also alluvial, estuarine, and marine deposits across the region associated with existing and/or historic water bodies.

The predominant subsoil across the region, particularly in the south, is glacial till derived from limestones. Further north, the Quaternary deposits are more varied, including deposits of Irish Sea till, tills derived from Lower Palaeozoic sandstone and from Namurian sandstones and shales. There are also widespread alluvial, gravel, estuarine and lacustrine deposits associated with ancient and more recent watercourses.

The underlying bedrock is variable across the region, being dominated by Carboniferous limestones and calcareous shales, with older Silurian deep marine sediments (mudstones, greywacke and conglomerates) and volcanic Ordovician basalt (andesite, tuff, slate & mudstone) also present.

There are a number of Geological Heritage Areas (all County Geological Sites) within the Proposed Development; Milverton Quarry to the south of Skerries Station, Fancourt Shore to the south of Balbriggan and the coastal plain and sea cliffs of Laytown to Gormanston.

9.3 Potential Impacts and Mitigation Measures

The potential impact of the Proposed Development on the soils and geology environment has been assessed by classifying the importance of the relevant attributes and quantifying the likely magnitude of impact on these. This assessment methodology is consistent with impact assessment criteria outlined Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

The majority of land and soils impacts are associated with the Construction Phase of the Proposed Development, which involves significant civil engineering works including earthworks, excavations, construction of retaining structures, shallow and deep foundations, and bridge construction and modifications. Construction Phase impacts considered for the assessment of potential impacts to land and soils include (1) loss or damage of topsoil, (2) earthworks haulage, (3) effect on the surrounding ground, (4) loss of future quarry or pit reserve, (5) excavation of potentially contaminated ground and (6) loss or damage of proportion of Geological Heritage Area.

Excavated topsoil will be stockpiled by the appointed contractor using appropriate methods to minimise the effects of weathering. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff. Excavations in made ground will be monitored by an appropriately qualified person to ensure that any hotspots of possible encountered contamination are properly identified, segregated, and disposed of appropriately. The impact of loss or damage to topsoil has been assessed to be of negligible to small adverse across the Proposed Development with an associated significance of imperceptible to moderate/slight.

The generation of earthworks volumes has been considered throughout the preliminary design and where possible, proposed excavation and/or depositional depths have been kept to a minimum to reduce cut and fill material volumes. Where possible, suitable excavated material will be retained within the Proposed Development boundary for reuse. Prolonged haulage and tracked machinery movements are planned within, or adjacent to, the various worksites or compounds. The impact has been assessed to be of negligible magnitude and imperceptible significance without mitigation.

The construction activities undertaken during the Construction Phase of the Proposed Development have the potential to effect the surrounding ground.

The potential soil and rock removed during the construction process may have the potential to induce movement and settlement of the surrounding ground. Machinery used during the construction process of the Proposed Development could result in minor ground vibrations with effects felt in the immediate vicinity of the works. The magnitude of such effects on the surrounding ground is considered negligible with an imperceptible significance due to the localised effected areas.

The excavation of soil and rock during construction can diminish future quarry and pit reserves. However, the magnitude of this impact is negligible with imperceptible significance as it results in an impact on the attribute of insufficient magnitude to affect either its use or integrity.

Excavation associated with foundations for the OHLE will take place within the Laytown to Gormanston County Geological Site. However, as the excavations are very small the magnitude of this impact is negligible with imperceptible significance as it results in an insufficient permanent irreversible change on a local scale to affect the integrity of the County Geological Site.

A Construction Environmental Management Plan (CEMP) will be implemented to manage the excavations, temporary stockpiling, haulage, and placement of materials, particularly in respect of how the soils will be contained and transported to suitable locations during construction. Construction techniques that comply with the requirements of statutory bodies (Local Authorities and EPA) in terms of noise, vibration, soil and groundwater contamination, and disposal of possible contaminated material for both soil and rock cuttings will be adopted.

Potential soil and water pollution will be minimised by the implementation of good construction practices. Such practices will include adequate bunding for oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance.

All earthworks and piling works will be undertaken in accordance with project-specific engineering specifications ensuring that all works are completed to the design requirements.

With the implementation of the proposed design, no additional mitigation measures for land and soils are considered necessary for the operation of the Proposed Development.

It is not intended that the infrastructure associated with the Proposed Development 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. Any such future renewal or refurbishment may require additional construction works, which would be similar to, but of a much lesser impact (in terms of extent and duration), than the Construction Phase associated with the DART+ Coastal North project.

9.4 Residual Effects

With the efficacious implementation of the above mitigation measures, there will be no significant residual impacts on land and soils as a result of the construction of the Proposed Development.

No significant residual impacts on land and soils as a result of the Operational or Decommissioning Phases of the Proposed Development have been identified.

10. WATER (INCLUDING HYDROLOGY AND FLOOD RISK)

10.1 Introduction

This chapter identifies the likely significant effects of the Proposed Development on the water environment including hydrology, drainage and flood risk. The assessment examines the potential impacts of the Proposed Development for the entire life cycle of the project, i.e., Construction, Operational and Decommissioning Phases. The assessment was based on publicly available material, site visit notes and water quality sampling (May - Aug 2023) as part of the baseline environmental assessment.

This hydrological impact assessment has been undertaken in accordance with the Guidelines on the information to be contained in Environmental Impact Assessment Reports (referred to as the EPA Guidelines) (EPA, 2022). Additional guidance used include the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and hydrogeology for National Road Schemes (NRA, 2009) and The Planning System and Flood Risk Management Guidelines for Planning Authorities (referred to as the FRM Guidelines) (DEHLG and OPW, 2009).

10.2 Receiving Environment

The Proposed Development lies within the Boyne (HA 07), Nanny-Delvin (HA 08) and Liffey and Dublin Bay (HA 09) Catchments. The Boyne Catchment includes area drained by the River Boyne and by all streams entering tidal water between The Haven and Mornington Point draining a total area of 2,694km². The Nanny-Delvin Catchment includes the area drained by the Rivers Nanny and Delvin and by all streams entering tidal water between Mornington Point and Sea Mount draining a total area of 711km^2. The Liffey and Dublin Bay includes the area drained by the river Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point in County Dublin, draining a total area of 1,616km^2.

The 2016-2021 WFD Status of the rivers and streams within the study area shows that the watercourses in the vicinity of the Proposed Development have “poor” status and are “at risk” of achieving a “good” status by 2027. Urban runoff, urban wastewater and agriculture have been identified as key pressures affecting the quality of these water bodies.

10.3 Potential Impacts

The Construction Phase is estimated to take place over a period of approximately 36 months, subject to obtaining the relevant statutory approvals, permits and licences. The assessment considers the potential impacts of the Proposed Development during construction activities prior to mitigation or control measures are implemented. The following construction activities are identified and analysed for potential hydrological effects:

Installation of Overhead Line Equipment (OHLE), and associated works required for electrification;

- Piling works;
- Temporary Construction Compounds;
- Traction substations and associated infrastructure;
- Utility diversions;

- Access and haul roads; and
- Transportation of concrete, fuel, and other chemicals with a potential to impact on water quality, etc.

The Construction Phase will also require the removal of topsoil or vegetation, track lowering, embankment widening and building of new retaining walls that may increase the risk of flooding and water quality degradation.

10.4 Mitigation Measures

As part of the Proposed Development, best practice construction methods, contained in the Construction Environmental Management Plan (CEMP), will be implemented that will ensure the construction related impacts are avoided or minimised as much as reasonably possible. Moreover, a construction Surface Water Management Plan (SWMP) that outlines appropriate mitigation measures for the Construction Stage is prepared. The SWMP contains protocols for pollution incident response, control of sediments, use of concrete and management of vehicle refuelling and wash facilities.

Eighteen watercourse crossings that interact with the Proposed Development have been identified. The majority of the works areas including the rail track and substations within the Proposed Development boundary are in Flood Zone C (low risk) and are >2m above the max flood level at each location. In these locations no mitigation measures are needed. The proposed embankment works at the Malahide turnback are adjacent to the estuary but will be above tidal flood levels.

The temporary Construction Compound, CC-16100 for the Malahide turnback at Caves Strand, is within an area at risk of tidal flooding. To mitigate the risk of tidal flooding, the usage of this compound will be restricted to the period from May to September. The extent of hard standing areas within the compound will be reduced as much as possible, and materials will be stored on elevated platforms. In the case of a flood warning, materials will be immediately removed.

10.5 Residual Effects

Given that the best practice construction methods and a SWMP will be in place, the impact of the Construction Phase of the Proposed Development is expected to be imperceptible. In places where instream work is required (Clongriffin Bridge), measures included in the CEMP and SWMP will be strictly adhered to.

11. HYDROGEOLOGY

11.1 Introduction

An assessment of the potential impacts associated with the Construction and Operational Phases of the Proposed Development on hydrogeology has been carried out. The assessment is based on a desk study, field measurements and a review of a ground investigation. The study area for this assessment extends 100m from the site boundary.

11.2 Receiving Environment

The study area is predominantly underlain by Locally Important Aquifers and Poor Aquifers. These are bodies of rock or sand / gravel beneath the surface that can provide wells with a good flow of water (Local Important Aquifer) or a poor flow of water (Poor Aquifer). In addition, the study area crosses a Regionally Important Aquifer for a stretch around Laytown Station. This is an aquifer with the potential to supply an excellent flow of water to a well. The field water levels recorded in the aquifers varied between approximately 0.5m below ground level (mbgl) and 10.5mbgl. They varied depending on the elevation of the ground level and whether a water feature is close to the place where the reading was taken.

The amount of water annually that can drain into the aquifers across the study area is generally low, except an area around Laytown which has a medium rate. The low amounts that can drain generally protects the aquifers and a lot of the study area has only a low or medium risk of being contaminated by activities at the surface. However, in a good number of locations the aquifer or water level in the aquifer is closer to the surface and the groundwater is potentially more susceptible.

No public water supply wells or catchment areas supplying public supply wells were highlighted in the study area. However, numerous protected ecological features were highlighted associated with the coastline and various estuaries crossed by the study area. Also, a protected marsh was noted north of Portmarnock Station. The regional groundwater flow is generally eastwards towards the coast and locally towards nearby surface water features. Hence all of these ecological features could have some connection with the study area.

11.3 Potential Impacts and Mitigation Measures

During the Construction Phase the following items have been highlighted that could have a potential impact on the hydrogeological environment:

- The installation of foundations for the Overhead Line Equipment (OHLE) masts;
- Improvements / modifications to bridges and existing depots at Drogheda and Fairview; and
- Modification to existing tracks and platforms, ancillary civil, drainage and landscaping works including the contractor compounds.

These could have the following impacts:

- Loss or damage of a proportion of the aquifer(s);
- Temporary storage of hazardous substances associated with the operation of construction vehicles e.g. fuels;
- Change to groundwater flow and levels; and

- Loss or damage of hydro-ecology designated sites.

Potential adverse effects were highlighted, however, with the implementation of suitable mitigation measures the overall impact on groundwater quality and nearby ecological features will be negligible.

During the Operational Phase very few potential impacts on groundwater quality were highlighted and these had a negligible impact.

11.4 Residual Effects

No significant residual impacts are anticipated during the Construction or Operational Phases.

12. AIR QUALITY

12.1 Introduction

This assessment considers the potential air quality impacts as a result of emissions to air associated with the Construction and Operational Phases of the Proposed Development. The assessment involved a review of available published data, a review of applicable guidelines, air quality monitoring at sensitive locations along the Proposed Development and calculations to assess air quality impacts that may occur as a result of the Proposed Development. The statutory ambient air quality standards in Ireland are outlined in S.I. No. 739 of 2022 Air Quality Standards, which incorporate the ambient air quality limits set out in Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe for a range of air pollutants. National and European Union air quality standards are set for the protection of human and ecological health. For the Proposed Development, the main air emissions of concern are PM_{10}, $PM_{2.5}$ and NO_2 concentrations, reflective of the road and rail transport related emissions and construction dust emissions as these pollutants are most likely to exceed limit values.

12.2 Receiving Environment

As part of the implementation of the Air Quality Standards Regulations, Ireland has designated four air quality zones (Zones A-D) in Ireland for the purpose of air quality management and assessment. The Proposed Development is located within air quality Zone A (Dublin conurbation), Zone C and Zone D. The baseline ambient air quality environment has been characterised through a desk study of publicly available published data sources and baseline ambient monitoring surveys undertaken in the area. This included air quality monitoring programmes operated by both the EPA and Local Authorities in the Dublin region. Average concentrations of nitrogen dioxide (NO_2) from EPA continuous monitoring stations in all zones show compliance with air quality standards.

Continuous particulate monitoring (PM_{10} and $PM_{2.5}$) is carried out by the EPA at various locations across the three zones. Concentrations of PM_{10} and $PM_{2.5}$ are well below the limit for the protection of human health. A number of locations were also identified as high sensitivity to dust soiling based on the nature of the work proposed and the number and proximity of sensitive receptors. In the absence of the Proposed Development, it is considered that there is a broad mix of EU and national policy and legislation directed at reducing transport, industrial and space heating emissions to improve air quality. It is expected that national and ambient levels of air quality pollutants will decrease in future years with the successful implementation of the above policy and regulation.

12.3 Potential Impacts and Mitigation Measures

The impact of the Proposed Development due to Construction Phase traffic in terms of NO_2, PM_{10} and $PM_{2.5}$ is considered neutral.

The magnitude of Construction Phase dust risk is determined is used to prescribe the level of site-specific mitigation required for each activity to prevent significant impacts occurring. In accordance with the EPA Guidelines (EPA 2022) the likely effects associated with the Construction Phase dust emissions pre-mitigation are overall negative, moderate, and short-term.

To reduce dust nuisance, a series of measures will be implemented including:

- An air quality management plan shall be prepared by the appointed main contractor to deliver the appropriate dust and emissions mitigation measures, applicable to the specific circumstances along the corridor, based on the mitigation in this EIAR, any planning conditions and local authority requirements as well as industry best practice;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- Liaison with local authorities and community groups will be ongoing throughout the pre-construction and Construction Phase.

The likely effects associated with the Operational Phase rail traffic emissions are overall neutral and long-term.

12.4 Residual Effects

Overall, it is considered that the residual effects relating to Construction Phase traffic emissions are short-term and not significant. Once the dust mitigation measures are implemented there will be no residual Construction Phase dust impacts.

No significant adverse impacts are identified during the Operational Phase.

13. CLIMATE

13.1 Introduction

This assessment considers the potential climate impacts associated with the Proposed Development. Climate is defined as the average weather over a period of time. Climate change is a significant change to the average weather, and while climate change is a natural phenomenon, human activities in recent years have negatively impacted on the climate, through the release of greenhouse gases. The assessment involved a review of greenhouse gas emissions, a review of applicable guidelines and predictive calculations to assess climate impacts. The Proposed Development was also assessed in terms of its vulnerability to climate change. Receiving Environment

13.2 Receiving Environment

The EPA published the 1990-2022 GHG inventory in July 2023 and the national GHG emissions are estimated to be 60.76 million tonnes carbon dioxide equivalent (Mt CO2eq). Transport accounted for 19% of national emissions, second only to agriculture (38%). Of the transport emissions, rail only accounts for approximately 1% of national transport emissions while road transport accounts for approximately 94%. In 2028 (opening year of the Proposed Development), the total projected GHG emissions for Ireland, with additional measures in place (including the implementation of the Climate Action Plan 2023), is 48,590kt (kilotonnes) CO_{2eq} with road transport emissions accounting for 7,750kt CO_{2eq} or 16% of total emissions (EPA 2023). The 2040 total projected GHG emissions for Ireland, with additional measures in place, are 34,731kt CO_{2eq}. Road transport emissions account for 3,749kt CO_{2eq} or 10.8% of the total (EPA 2023). In addition to the Proposed Development's impact on climate change, the vulnerability of the Proposed Development to climate change has also been considered. Vulnerabilities include increases in temperatures, increases in the number of rainfall days per year, more intense storms and rainfall events and increased likelihood and extent of river and coastal flooding. In the absence of the Proposed Development, it is anticipated that the existing railway line will continue to operate, albeit with the constraints on capacity and frequency in the short to medium term curtailing modal shift from private car to public transport use. The potential GHG reductions with regard to modal shift from road traffic to rail traffic will not occur and achievement of climate targets may be curtailed as a result.

13.3 Potential Impacts and Mitigation Measures

The impacts assessed during the Construction Phase included emissions from activities such as site clearance, embodied carbon from construction materials and their transport, waste materials and excavation works (where required), water and fuel usage. The results indicate that the total GHG emissions generated as a result of the construction of the Proposed Development are equivalent to an annualised total of 0.011% of Ireland's 2030 transport target. Construction traffic has also been assessed. The results indicate that emissions on the surrounding road network will slightly increase relative to existing traffic emissions.

The Proposed Development is predicted to result in a slight increase in overall CO_2 emissions. However, there is a predicted decrease in carbon emissions when considered on a per carriage km basis. Calculations assume 80% renewables have been met both in the Do Minimum and Do Something.

There is potential for indirect positive impact to climate from modal shift from road traffic to rail traffic. Road transport is one of the principal sources of GHG emissions in Ireland and reducing the number of car kilometres travelled through modal shift will reduce emissions from road transport. The Proposed Development will have no adverse impact on road traffic redistribution.

The Iarnród Éireann Sustainability Strategy 2021-2030 (Iarnród Éireann 2021) will be implemented to ensure reduction in the carbon footprint through measures such as relevant ISO and national NSAI energy and environmental standards; recycling of 70% of all wastes; and implementation of efficiency programmes for waste and water management and green procurement.

13.4 Residual Effects

The overall residual impact of the Proposed Development is considered to be minor adverse in the short term due to the Construction Phase, however as Ireland further progresses towards net carbon zero and the percentage of renewables within electricity utilised for rail further increases the long-term impact of the Proposed Development is considered to have a beneficial effect on climate. It is also noted that the Proposed Development once operational will carry more passengers in the Do Something scenario compared to the Do Minimum scenario, this results in a greater saving in carbon emissions when considered on a per carriage basis.

14. NOISE AND VIBRATION

14.1 Introduction

The noise and vibration assessment considers the likely significant effects with regards to noise and vibration associated with both the Construction and Operational Phases of the Proposed Development. The study area covers the existing railway corridor spanning four local authorities with noise-sensitive receptors identified within 300m of the rail line (or the area within which noise levels from the proposed development are forecast to give rise to potential impacts), whichever is the greater.

Noise and vibration surveys were carried out along the railway corridor to help assess the existing noise and vibration environment, identify sensitive areas and inform the Proposed Development's design. The surveys were supported by the Round 3 strategic noise maps published by the Environment Protection Agency and helped to identify the existing noise exposure for the study area.

The construction noise and vibration assessment was undertaken with reference to national and local guidelines, using a widely accepted prediction methodology, reported best practice mitigation measures, and identified locations where temporary to short-term residual adverse significant effects are likely to occur. The operational noise and vibration assessment was undertaken by calculating the beneficial and adverse impacts resulting from the operation of the future train movements during the day and night. No significant operational noise and vibration effects are reported provided that the recommended design and maintenance of the public address system and rail systems are implemented. An assessment of nearby committed developments has been performed and are reported to be unlikely to result in new significant adverse effects.

14.2 Receiving Environment

The likely future receiving environment has been informed by the noise and vibration surveys conducted at locations near sensitive receptors and the Round 3 strategic noise maps. A noise model of the existing noise exposure was created and then recalculated with the changes to the train flows that are likely to occur without the scheme to identify the likely future receiving environment for the operational railway noise assessment. The vibration surveys indicate the closest sensitive properties are exposed to appreciably levels of railway vibration.

14.3 Potential Impacts and Mitigation Measures

The assessment evaluates the potential noise and vibration impacts of the Proposed Development during the Construction and Operational Phases, using appropriate prediction methods and criteria. The document considers the impacts of construction activities, construction traffic, operational rail noise, operational road traffic noise, and operational vibration on the noise sensitive receptors. The document also assesses the cumulative effects of the Proposed Development with other planned or consented developments in the vicinity.

The document proposes a range of mitigation measures to minimise the noise and vibration impacts of the Proposed Development, such as implementing best practice construction methods, monitoring noise and vibration, providing noise barriers, performing maintenance of rail systems, and offering temporary accommodation where necessary.

The document also outlines the roles and responsibilities for implementing the mitigation measures and ensuring compliance with the relevant standards and regulations. No operational noise barriers are considered necessary to avoid likely significant operational noise effects.

14.4 Residual Effects

With the implementation of the best practice mitigation measures, the residual adverse construction noise effects are reported to be temporary to short-term and the residual adverse construction vibration effects are reported to be brief to temporary. The locations of residual construction effects are at sensitive receptors nearest to the construction activities. No significant residual noise or vibration effects as a result of the Operational or Decommissioning Phases of the Proposed Development have been identified.

15. LANDSCAPE AND VISUAL

15.1 Introduction

This assessment considered the potential landscape (townscape) and visual impacts of the Proposed Development. This assessment involved desk based review of available information including aerial photography and mapping of the Proposed Development. Route walkovers were carried out to verify desk based findings and this included field surveys of specific areas.

15.2 Receiving Environment

Zone A passes through largely suburban areas in the north-east portion of the Dublin conurbation in proximity to Dublin Bay; from the River Tolka and the edge of the inner-city commercial and mixed-use residential areas; through areas of outer city suburbs of Clontarf, Killester, and Donaghmede. The suburbs are largely composed of 20th century detached / semi-detached properties. There are a number of modest commercial areas and institutional uses throughout with significant areas of open space present at Fairview Park, Clontarf Golf Course and the Santry River corridor. Major open space designations are present at Fairview Park, St. Annes Park, Clontarf Golf Course and the Santry River corridor.

Zone B passes through a gradient of varying urban townscape / landscape / seascape characters: from the outer city suburban residential areas of Donaghmede; through the emerging neighbourhoods of Clongriffin / Belmayne, Baldoyle / Stapolin and Portmarnock South / Drumnigh Manor; through the urban-fringe / semi-rural area between Malahide and Portmarnock; into the urban area of Malahide town; before crossing Malahide Estuary. The zone includes a linear park parallel to St. Donagh's Road, Donaghmede which is a designated open space and Conservation Area. There are major amenity areas at Malahide Castle Demesne and at Malahide Golf Club, and architectural conservation areas (ACA) are present in Malahide.

Zone C passes through the estuarine landscapes of Malahide and Rogerstown estuaries to the south, inland sections of rural coastal plain between Rush, Lusk and Skerries before following the coast line to the northern border of Fingal north of Balbriggan. High amenity designation covers much of the rural coastline and areas around the estuaries, including the panoramic view at Ben Head. Beaverstown Golf Course and Skerries Golf Course adjoin the railway. The historic demesnes of Newbridge and Argillan are designated ACAs.

Zone D comprises rural low-lying coastal plain along a straight coastline with continuous stretches of sandy beach. Rural development is mainly scattered along local roads with some clustered settlements as well as the larger seaside settlement of Bettystown and adjoining Laytown. The land cover comprises a mixture of arable and pasture lands in a small-scale pattern of fields which are frequently separated by hedgerows. The River Nanny dissects this zone running from the west to meet the sea at Laytown. High Amenity areas are present in Laytown to the north of the River Nanny Estuary and along the beachfront. Designated Open Space west of Laytown Station and north of the railway on the outskirts of Drogheda. Zoned area of Community Infrastructure south of Laytown comprising Seafield – St. Colmcille's GAA Club and Laytown Pitch and Putt Club.

Zone E is entirely within Louth and the suburban / urban context to the southeast of Drogheda town centre. The station is south of the River Boyne which flows west to east beneath the Boyne Railway Viaduct (UBB82). The lands of Drogheda MacBride Station, the railway corridor (north to R150 Marsh Road) and the lands to the north of the station are zoned J1 Transportation Development Hub in the Louth Development Plan. This zoning includes McBride Pitch and Putt Course and adjoining areas north / northeast of the station. Lands to the west and south of the station comprise established residential areas at Carmelite Cottages, Pines Hamlet, Cromwell's Lane / St. Mary's Villas (west of Dublin Road), Dublin Road and Railway Terrace (leading to McGrath's Lane). An ACA is present for Nos. 1 to 6 Railway Terrace. New Residential and Public Infrastructure and Utilities are zoned to the east with planning consented for new development. The station area is relatively well-screened within its immediate setting and the main entrance to the station is defined by the R132 Dublin Road, with its stone retaining wall along the road and stone wall at the top of the embankment. The main station carpark, which adjoins the railway corridor and station buildings, is located off the Dublin Road. A Trees of Special Amenity Value designation is present for existing trees adjacent to the Dublin Road railway bridge.

15.3 Potential Impacts and Mitigation Measures

15.3.1 Construction Effects

Potential construction effects are likely to result from the following impacts:

- Removal of existing landscape features, trees, hedgerows;
- General landscape disturbance including disturbance adjacent to existing property boundaries;
- General construction activity, site compounds, construction traffic;
- Temporary, realigned or regraded access routes;
- Regrading, retaining and engineering works to railway lines;
- Construction of overhead line equipment (OHLE) to existing and proposed lines;
- Construction of substations and associated boundaries and access routes;
- Modifications to existing railway stations, depots and structures;
- Construction of new signalling (signal head, location cases, signal gantries);
- Construction works to existing bridges including protected structures; and
- Diversions to existing services including construction of new under track crossings.

The Proposed Development crosses a mixture of urban, suburban and rural landscapes and townscapes where residential development and landscape amenities are often located in close proximity. The proposals will occur largely within the existing railway lands or near to the railway corridor. Locations of major development outside of the railway corridor are limited to establishment of new substations and associated access routes.

The provision of the Proposed Development will inevitably give rise to some localised substantial changes and impacts on the local landscape and on views from properties sited in the vicinity of the more substantial offline parts of the development. The landscape and visual impacts will be most pronounced during the construction and initial operation stages, after which landscape mitigation measures are expected to be increasingly effective in integrating the Proposed Development within the landscape and in reducing landscape and visual impacts. Construction effects will be temporary or short-term in duration.

Appropriate measures to avoid or reduce negative landscape (townscape) and visual impacts during the Construction Phase will be implemented, including ensuring that trees and vegetation to be retained within and adjoining the works area will be protected. Works required within the root protection area (RPA) of trees to be retained will follow a project specific arboricultural methodology for such works, which will be prepared / approved by a professional qualified arborist.

Potential Construction Phase effects will be:

- There is potential for slight / moderate negative effects on the landscape / townscape character of Zones A and B, moderate / significant negative effects on Zones C and E and a moderate negative effect on Zone D;
- There will be moderate negative effects on Central Malahide and Central Balbriggan ACAs, a significant effect on the Railway Terrace ACA and slight negative or imperceptible effects on other ACAs within the study area;
- There will be a slight negative effect on conservation areas at the River Tolka, the River Santry and the linear park at Donaghmede;
- Effects on residential conservation areas will be imperceptible;
- For effects on protected structures, there will be a moderate negative effect on Rail bridge at Grange / Maynetown (UBB19) (FCC RPS No. 919), a moderate / significant negative effect on Malahide Railway Viaduct (UBB30) (FCC RPS No. 420), moderate / significant effects on structures directly impacted in Zones C and D (including Rogerstown Viaduct and Laytown Viaduct), and moderate effects on structures at Drogheda MacBride Station. Other effects on protected structures will be slight / moderate negative or less;
- There will be a significant negative effect on the designated High Amenity Area at Laytown and on the Public Realm Redevelopment, Quay Street and Environs, Balbriggan (assuming this is developed before the construction takes place);
- There will be a moderate / significant effect negative on Skerries Golf Course, and moderate negative effects on Fingal High Amenity areas, Open Space at Carndonagh Lawn / St Donagh's Road, Broadmeadow Greenway, the open space / riparian corridor west of Laytown Station and MacBride Pitch and Putt. Other designated opens spaces will have a slight / moderate negative effect or less;
- There will be a significant negative effect on Trees of Special Amenity Value at Dublin Road Rail Bridge, Drogheda;
- There will be a significant negative effect on the protected view at the R132 Bremore, moderate effects on protected views at Bissetts Strand, Malahide Estuary, Station Road R128 at Effelstown, R127 Skerries Road / Railway to Balbriggan and The Bower at Balbriggan, and slight or imperceptible effects on other protected views in the study area;
- There will be a moderate / significant negative effect on residential properties, fronting and viewing key offline works such as new substations;
- There will be a moderate negative effect on the non-residential properties with land acquisition and residential properties which are not viewing key offline works; and
- There will be significant negative effects on trees and vegetation in localised areas throughout the scheme.

A series of mitigation and management measures are proposed to avoid, reduce or remediate, wherever practicable significant negative landscape (townscape) and visual effects of the Construction Phase of the Proposed Development including ensuring that trees and vegetation to be retained within and adjoining the works area will be protected. These measures are to be applied across the scheme wherever necessary to avoid disturbance of landscape features or characteristics to be retained. Generally, the effect rating post-mitigation will be the same as pre-mitigation, however the measures proposed should still be applied as necessary to manage the potential effects of construction activities.

Potential operational effects are likely to result from the following impacts:

- Residual effects on landscape and visual character and on designated landscape and visual aspects, including loss of trees and hedgerows;
- Visual intrusion on properties and amenities from new elevated structures, OHLE, signalling, bridges, embankments, retaining walls, fences, barriers, gantries;
- Visual intrusion on properties and amenities from new structures, fencing and OHLE associated with the electrification of the rail line;
- Effects from new elevated road lighting and illumination from traffic lights; and
- Effects arising on sites of biodiversity and cultural heritage significance.

Potential Operational Phase effects will be:

- There will be a moderate / significant negative effect on the landscape character of Zone C and Zone E, a moderate negative effect on Zone D, a slight / moderate negative effect on Zone B and a slight negative slight Zone A;
- There will be a significant negative effect on the Railway Terrace ACA and slight negative or imperceptible effects on other ACAs within the study area;
- There will be a slight neutral effect on conservation areas at the River Tolka, the River Santry and the linear park at Donaghmede;
- Effects on residential conservation areas will be imperceptible;
- For effects on protected structures, there will be a moderate negative effect on Rail bridge at Grange / Maynetown (UBB19) (FCC RPS No. 919), a moderate negative effect on Malahide Railway Viaduct (UBB30) (FCC RPS No. 420), slight / moderate effects on structures directly impacted in Zones C and D (including Rogerstown Viaduct and Laytown Viaduct) and for structures at Drogheda MacBride Station. Other effects on protected structures will be slight negative or less;
- There will be a significant negative effect on the designated High Amenity Area at Laytown and on the Public Realm Redevelopment, Quay Street and Environs, Balbriggan (assuming this is developed before the construction takes place);
- There will be a moderate / significant effect negative on Skerries Golf Course, and moderate negative effects on Fingal High Amenity areas, Meath High Amenity Area at Laytown, Open space / riparian corridor west of Laytown Station and MacBride Pitch and Putt. Other designated opens spaces will have a slight negative effect or less;
- There will be a significant negative effect on Trees of Special Amenity Value at Dublin Road Rail Bridge, Drogheda;

- There will be a moderate / significant negative effect on the protected view at the R132 Bremore, moderate effects on protected views at Station Road R128 at Effelstown, R127 Skerries Road / Railway to Balbriggan and The Bower at Balbriggan, and slight or imperceptible effects on other protected views in the study area;
- There will be a moderate / significant negative effect on residential properties, fronting and viewing key offline works such as new substations;
- There will be a moderate negative effect on the non-residential properties with land acquisition and residential properties which are not viewing key offline works; and
- There will be significant negative effects on trees and vegetation in localised areas throughout the scheme.

Operational effects have the potential to be long-term. A series of mitigation measures are proposed to avoid or reduce negative landscape (townscape) and visual impacts during the Operational Phase and will include:

- Where existing trees, hedges, and / or plantings are to be removed from temporary land take areas be provided in replacement of those that are removed;
- The Proposed Development will provide for the planting of new trees and shrubs both for mitigation of tree / hedgerow removal and for screening of proposals particularly substations; and
- All impacted property boundaries will be reinstated.

15.4 Residual Effects

Mitigation and management measures are proposed to avoid, reduce or remediate Construction Phase effects. The residual effect rating post-mitigation is considered to be the same as pre-mitigation, however the measures proposed should still be applied as necessary to manage the potential effects of construction activities.

Following the establishment of mitigation measures, most notably from the growth of replacement / screening vegetation but also due to gradual acceptance of the proposed changes by receptors, the scheme will become increasingly integrated within its landscape (townscape) setting. This will result in the gradual mitigation of potential negative Operational Phase effects over time. A summary of the residual long-term Operation Phase landscape and visual impacts following implementation of mitigation measures and monitoring is set out below:

- There will be a moderate negative effect on the landscape character of Zones C, D and E;
- There will be a moderate negative effect on the ACA at Nos 1 – 6 Railway Terrace;
- There will be a moderate negative effect on the protected structure of Malahide Railway Viaduct (UBB30) (FCC RPS No. 420);
- There will be a moderate effect on Trees of Special Amenity Value at Dublin Road, Drogheda;
- There will be a moderate negative effect on Meath High Amenity Area at Laytown;
- There will be a moderate negative effects on R127 Skerries Road / Railway to Balbriggan, The Bower, Balbriggan;
- There will be moderate effect on residential properties impacted by land acquisition and/or loss of planting during the Operational Phase; and
- There will be a moderate negative effect on trees and vegetation.

16. MATERIAL ASSETS – AGRICULTURAL PROPERTIES

16.1 Introduction

This assessment considered the potential agricultural impacts of the Proposed Development. This assessment involved desk-based review of available information including aerial photography, and mapping of the Proposed Development. A drive-by survey was conducted by the author and he had consultations with the land liaison officer.

16.2 Receiving Environment

The agricultural study area in this assessment is defined as the combined area of agricultural land parcels where there are direct landtake and land separation effects from the Proposed Development as set out in Figure 16.1 in Volume 3A of this EIAR. There are 58 agricultural land parcels within the agricultural study area where there will be direct effects from temporary or permanent landtake. The study area is divided into five zones (see Figure 16.1). The soil types along the Proposed Development are good quality supporting both arable and grassland cropping. Along the Proposed Development there are no dairy land parcels, there are 16 beef and or sheep land parcels, 30 tillage land parcels, six mixed livestock and tillage land parcels, four equine land parcels and two horticultural enterprises. Three of the equine land parcels and one horticultural enterprise are categorised as high sensitivity. One horticultural enterprise is categorised as very high sensitivity. The remaining land parcels are medium and low sensitivity.

16.3 Potential Impacts and Mitigation Measures

Potential impacts arise from disturbance during the construction period caused by construction noise, dust and traffic movement. Excavation of soil can impact on land drainage and soil structure. Landtake will reduce the area of affected land parcels. There will be approximately 26 hectares of landtake due to the Proposed Development in the 58 affected land parcels. This approximate landtake area is a combination of temporary landtake (17ha) and permanent landtake (9ha). Temporary landtake is required for construction compounds, working areas, access tracks and utility diversions. When the construction period is finished the temporary landtake will be returned to the landowners, however it is anticipated that there will be medium to long term damage to soil structure in these temporary landtake areas. Permanent landtake is required for the construction of fixed infrastructure such as stations and associated infrastructure and represents a permanent reduction in the area of land parcels.

The access to one low sensitivity land parcel owned by Fingal County Council is permanently severed where a level crossing is being closed (north side of Malahide Estuary). The temporary landtakes cross agricultural land causing severance in 28 land parcels.

Mitigation measures are detailed in Chapter 16 of this EIAR. A landowner liaison officer will be available to communicate with farmers in advance of works. Suitable boundary fencing will be erected around working areas to exclude livestock. Farmers will have continuous access to their land where reasonably practicable. Alternative water and electricity supplies will be maintained if interrupted due to construction. If disturbed land drainage will be repaired and reinstated to pre-works condition.

16.4 Residual Effects

Following implementation of mitigation there will be two moderate adverse residual impacts, in land parcels Ref No 3 and 33, due to a combination of permanent land loss and damage to soil structure, which is assumed to medium - long term. There are three slight adverse residual impacts in land parcels Ref No 1, 27 and 50, which arise from a combination of permanent land loss and damage to soil structure on small areas of land parcels. The remaining residual impacts (i.e No. 53) are not significant. This represents a relatively low impact on agricultural and parcels because the areas affected are small and the majority of the landtake is temporary.

17. MATERIAL ASSETS – NON-AGRICULTURAL PROPERTIES

17.1 Introduction

The Material Assets: Non-agricultural properties assessment considers the impact of the proposed DART+ Coastal North project on non-agricultural property during the Construction and Operational Phases. The study area comprises non-agricultural properties directly impacted by the Proposed Development. Non-agricultural property includes the following: residential lands, commercial lands, development lands, public infrastructure (roads), private roads, car park areas, rights of way, amenity lands, and non-agricultural greenfield areas etc.

17.2 Receiving Environment

The Proposed Development will modify the current rail network between Dublin City Centre (north of Connolly Station) and Drogheda (Drogheda MacBride Station).

The Proposed Development extends across four administrative areas/local authority areas, including Louth, Meath and Fingal County Council as well as Dublin City Council administrative areas. The total length of the Proposed Development is approximately 50 kilometres.

The receiving environment along the corridor ranges from a more a dense urban setting in Zone A, B and sections of E, to a more rural setting in parts of Zones C, D and E. While the majority of permanent interventions proposed will be accommodated within the existing rail corridor on lands owned by CIÉ, due to the scale of the DART+ Coastal North Project some interventions outside the existing railway corridor are required on third party lands e.g. for the provision of substations, Construction Compounds, utility diversions etc.

The non-agricultural property types along the Proposed Development include residential properties including apartments, public infrastructure, commercial/industrial properties, Government / Public Land, community facilities (park) / public open space and development lands. Each property type has been assigned a baseline rating from low to high.

In the absence of the Proposed Development it is anticipated that land and properties required for the Proposed Development will remain in existing use albeit with some general improvements/ changes in the area driven by legislative and local policy.

17.3 Potential Impacts and Mitigation Measures

The main construction activities that will give rise to direct impacts on non-agricultural property include temporary landtake for Construction Compounds, works areas for retaining walls, bridge modifications, utility diversion (and decommissioning of existing utilities) and demolition of an overbridge in Drogheda on Railway Terrace / McGrath's Lane. Indirect impacts to non-agricultural properties will arise from disturbance from noise, dust, construction traffic, reduced access and disruption of utility services. These issues are mitigated through the relevant sections for air, noise and traffic.

During the Construction Phase, the Proposed Development will involve a total non-agricultural temporary landtake of 21ha. Approximately 5.6ha are for lands over which temporary Private Rights of Way or Other Easements may be acquired and additionally 2.6ha are for land of which temporary possession may be taken on public roads.

During the Operational Phase, the Proposed Development will involve a total non-agricultural permanent landtake of 7.2ha. Approximately 3.4ha of this are for lands over which Permanent Private Rights of Way or Other Easements may be acquired (of which approximately 1.7ha are on public roads). This includes permanent easements for access. No permanent landtake is required on any property that requires the demolition of a residential, community or commercial building. Assets such as bridges, viaducts, walkways and roads may altered for the Proposed Development. Utilities will be diverted and decommissioned as necessary.

At this stage of the planning process compensation for land acquisition and disturbance are not considered. These matters will be agreed with landowners or their representative(s) as part of the land acquisition process (compulsory purchase order or CPO) should approval for the Proposed Development be granted.

Other key mitigation measures include the reinstatement of lands temporarily acquired. Access will be maintained to all affected property as much as possible and if interrupted will be restored without unreasonable delay. Traffic management measures will be put in place during the Construction Phase where temporary or minor diversions are required. Where part of the curtilage of a property is to be permanently acquired, the acquiring authority will hold discussions with the property owner and generally agree to replace boundaries on a like-for-like basis where possible, subject to safety considerations.

17.4 Residual Effects

There is predicted to be a residual significant effect on six land parcels out of a total of 228 for non-agricultural parcels, however the majority of impacted properties will achieve slight or imperceptible impact post mitigation.

18. MATERIAL ASSETS – UTILITIES

18.1 Introduction

The Material Assets – Utilities assessment examines and considers the potential impacts that the proposed DART+ North project may have on utility assets located within close proximity of the proposed works. The assessment establishes the existing scenario, referred to as the baseline, before determining what measures are required for the proposed works to be undertaken and the likely impact they will have on utilities.

The term 'utilities' encompasses the services provided to consumers, both public and private, which facilitate economic and social development. These include potable water mains, foul and combined sewers, surface water sewers, gas and electricity transmission networks and telecommunication networks. These may be present above or below ground and are provided by both public and private suppliers.

In this assessment, the likely impact on utilities was established and quantified at locations where utilities were found to be present and deemed to require interventions as a result of the proposals. The magnitude of the impact was considered with regard to the estimated length of time that the utility would be out of service and the importance of the utility to the area.

18.2 Receiving Environment

In order to determine how utilities may be impacted by the proposed works, it was first necessary to establish their locations and classifications in the existing scenario. This is referred to as the baseline scenario and allows for the impact of the proposed works to be compared against the consequence of no interventions.

Information pertaining to the presence of existing utilities was gathered through the collation of utility data gathered from utility providers, a desktop study and field inspections. This data was then mapped and examined along the route of the proposed works. Given the nature of the proposed works, the analysis of the receiving environment was concentrated along the existing railway track alignment, train stations and areas associated with the above, such as train station car parks and immediately surrounding areas. Roads and bridges crossing the tracks were also examined, as these are typically key crossing points for utility infrastructure.

The establishment of the baseline scenario indicated that a significant utility presence in the Proposed Development area is currently identifiable. Road and bridge crossings of the tracks gave rise to the majority of utility crossings; however, crossings were also noted as being present in other areas also. Crossings occurred both above and below the existing tracks, and were comprised of telecommunication cables, gas mains, watermains, foul sewers and surface water sewers.

There were significant variations in the size and importance of the utilities identified within each asset class. For example, some of the identified low voltage cables crossing the tracks could be seen to supply a single dwelling, while another crossing could be seen to be of national strategic importance, such as the 500MW HV east-west interconnector.

18.3 Potential Impacts and Mitigation Measures

The impacts associated with the proposed works would primarily occur during the construction stage of the Proposed Development's lifecycle. This would be to divert or protect utility assets clashing with the proposed works, or through the alteration of utilities to facilitate the works through the provision of services to distinct areas.

An analysis of potential impacts was conducted by examining the existing utility scenario and assessing the likely requirements necessary to meet the Proposed Development's construction requirements. Where it was deemed likely necessary to divert utilities, the utility asset owners were proactively engaged for extensive consultation on their requirements and preferences. This allowed for the project team to reach agreements in principle with the asset owners, and to mitigate the risk of disagreements at a later date. It also ensured that any assets which could not be altered could be identified.

The impacts of the proposed works on utilities were measured based on the likely length of time that the utility would be out of operation and the importance of the utility to the area. The majority of the potential impacts were assessed as being of slight and moderate significance, with 18no. being considered significant and one being very significant.

The significant impacts relate to overhead ESB cables requiring diversion due to their proximity to the proposed OHLE expansion north of Malahide Station, where OHLE infrastructure is not currently present. A minimum clearance distance is required to ensure that electrical interference does not occur, which in turn necessitates the provision of the diversions. The very significant impact identified also relates to overhead ESB cables in close proximity to proposed OHLE infrastructure, with the additional level of significance being derived from the additional length of outage anticipated due to the length of the diversion.

Mitigation measures are proposed in both the Construction and Operational Phases. During the Construction Phase, mitigation is possible through the phasing of outages in affected areas, advanced detailed determination of utility locations, pre-notification to impacted stakeholders and close collaboration with the utility provider. In addition to these mitigation measures, best practice construction measures during the diversions shall reduce the risk to operatives and the general public in the immediate area.

During operation, the substations providing power to the OHLE infrastructure shall remain operational to ensure continuity of service to the DART.

18.4 Residual Effects

With the implementation of the mitigation measures, the residual effects of the Proposed Development on utilities is considered to be neutral. Utilities shall continue to be subject to the maintenance requirements deemed necessary by their providers.

19. MATERIAL ASSETS – RESOURCE AND WASTE MANAGEMENT

19.1 Introduction

The Material Assets – Resource and Waste Management assessment considers the types of waste that could be generated by the Proposed Development, as well as the potential for reuse of materials. This assessment included a desk-based review of relevant policy and legislation, and data on waste generation and waste and resources management.

Potential impacts on waste and resources have been assessed for both the Construction Phase (including site clearance, demolition, excavation, and general construction works) and the Operational Phase.

Sustainable waste and resource management principles have been incorporated into the design of the Proposed Development and these principles will also be applied in line with the circular economy model (see Image 19-1) throughout the Construction and Operational Phases. This will ensure that waste generation will be minimised.

Image 19-1 Simplified model of the circular economy for materials and energy (Source: European Environment Agency (EEA), 2016)

19.2 Receiving Environment

In Ireland, the most recently available published data records that 9 million tonnes of construction and demolition waste was generated in 2021. This represented an increase of 800,000 tonnes from 2020. Of this waste, 7.7 million tonnes comprised soil and stones, and these make up 85% of the current construction and demolition waste stream.

The Proposed Development is located within the administrative areas of Dublin City Council, Fingal County Council, Meath County Council and Louth County Council which are part of the Eastern Midlands Waste Region. Waste management in Ireland is guided by the National Waste Management Plan for a Circular Economy 2024-2030. Licensed waste facility capacity is most prominent in the Eastern Midlands Waste Region, with it containing 80% of the active national capacity.

Municipal waste (i.e., typical household waste types) in Ireland is made up of household waste as well as commercial and other waste that, because of its type, is similar to household waste. According to the Environmental Protection Agency, Ireland generated 3.17 million tonnes of municipal waste and recycled 26% of this waste in 2021.

19.3 Potential Impacts and Mitigation Measures

The main construction elements that are likely to result in potential impacts on waste and resources will include:

- Site clearance and demolition: removal of vegetation, hardstanding and structures, and removal of / modifications to two overbridges and one underbridge;
- Excavation: excavation of below ground material such as soil and stones;
- Imported material: import of materials for the construction of new buildings / bridges / rail infrastructure;
- Construction: waste materials generated from and in relation to the construction of new buildings / bridges / rail infrastructure; and
- Municipal waste: generation of municipal waste materials.

A minor quantity of organic waste material from site clearance works and approximately 4,000 tonnes of demolition waste will be generated as a result of the Proposed Development. The total forecast of excavation material from the Proposed Development from the permanent works will be approximately 184,800 tonnes. The total forecast of excavation material from the Proposed Development from the temporary works will be approximately 249,100 tonnes. There is potential for reusing excavation material in the Proposed Development and this will be done where reasonably practicable.

The Construction Phase will require the importation of a number of key construction materials for the Proposed Development works. The quantities of the materials required represent a small proportion of the Irish quantities manufactured per year. Minor quantities of construction waste will be generated during the Construction Phase from the construction works, while minor quantities of municipal waste will be generated during the Construction Phase from site offices and welfare facilities.

The main potential impacts on waste and resources during the Operational Phase will be project related construction and demolition waste generated from the maintenance of buildings / rail infrastructure and municipal waste generated from passengers accessing the rail service.

A range of mitigation measures will be implemented to avoid or reduce negative impacts on waste and resources during the Construction Phase and Operational Phase, including minimising waste disposal. Opportunities for reuse of materials, by-products and wastes will be sought throughout the Construction Phase of the Proposed Development. This will be managed through the Construction Phase by the appointed contractor through the implementation of a Construction and Demolition Waste Management Plan. During the Operational Phase, Córas Iompair Éireann (CIÉ) will re-use and recycle materials throughout the site, to the maximum extent possible and make use of local suppliers when importing materials to site, thereby minimising potential impacts.

19.4 Residual Effects

The Construction Phase and Operational Phase of the Proposed Development are not predicted to give rise to any significant residual impacts following the adoption of sustainable resource and waste management principles and the implementation of mitigation measures.

20. ARCHAEOLOGY AND CULTURAL HERITAGE

20.1 Introduction

The Archaeology and Cultural Heritage Chapter considers the historic environment, national monuments, recorded archaeological monuments (RMP), sites and monuments (SMR), stray finds, archaeological artefacts, historic landscapes, cultural heritage features, place names, and inherited traditions, events and people as part of the assessment for the Dart Coastal Project.

This chapter has assessed the potential effects on Archaeology and Cultural Heritage arising from the Proposed Development during the Construction and Operational Phases.

20.2 Receiving Environment

The area examined for this study includes the full extent of the Proposed Development corridor. In order to inform the likely significant impacts from an archaeological and cultural heritage perspective, a 250m assessment study area was established on either side of the existing railway line.

The study area is set within a coastal context from Dublin to Drogheda along the existing rail corridor, with a number of inlets and rivers punctuating the coastline requiring bridges and viaducts for the railway line to cross. Documentary, cartographic research, aerial photography, field survey, geophysical survey, archaeological investigations including monitoring of SI works and photomontages assisted in providing an understanding of the receiving recorded archaeological and cultural heritage environment and potential. The construction design has clearly screened out any affect occurring within rivers or estuaries and as a result of this deliberate design strategy, no underwater affects are anticipated.

20.3 Potential Impacts and Mitigation Measures

There are no impacts to National Monuments and recorded monuments throughout Zones A, B, C, D and E of the Proposed Development.

Some ground disturbance will be required outside of the existing railway boundary and there is a possibility that these works may impact on previously unknown below ground archaeology, these works include:

- Construction of substations;
- Ground works required for construction/storage compounds and access roads;
- Footings for bridge modifications/improvements to facilitate extended electrification;
- Secant and cantilevered walls;
- The temporary/permanent diversion, realignment and widening of roads, junctions and pavements, and/or the provision of temporary access routes;
- Utility diversions;
- Drainage and attenuation; and
- Landscaping works

It has been acknowledged that access for decommissioning existing utilities will not require earthmoving or excavation works. Similarly, no excavation works will be required for access work for

UTX, track matting or geotextile solutions will be sought. For UTX compounds there will be no excavation or topsoil stripping of the ground surface. A geotextile solution with hardcore will be sought if required within the compound location.

Given the greenfield nature of the land, Areas of Archaeological Potential (AAP) were identified from desk based analysis and field surveys based on the type and extent of invasive works proposed as part of the Proposed Development.

In total 38 areas of archaeological potential were identified throughout the Proposed Development corridor. In Zone A an imperceptible/ not significant impact was identified. In Zone B, five areas of archaeological potential were detected. In terms of significance, they were determined to be 3 slight, 1 Moderate and 1 had no impact. In Zone C, 17 areas of archaeological potential were detected. In terms of significance, they were determined to be 2 not significant, 10 Slight and 5 Moderate. In Zone D, 13 areas of archaeological potential were detected. In terms of significance, they were determined to be 1 not significant, 10 Slight and 2 Moderate. In Zone E, 2 areas of archaeological potential were detected. In terms of significance, they were determined to be 1 Slight and 1 Moderate. As part of the Code of Practice agreed between the Department of Arts, Heritage and the Gaeltacht (AHG) (now the Department of Housing, Local Government and Heritage) and IÉ a Project Archaeologist will be appointed to develop and manage a centralised framework for tracking and managing all archaeological considerations. The Project Archaeologist will oversee the implementation and reporting of all archaeological and cultural heritage mitigation measures. Archaeological mitigation measures can avoid, prevent, reduce or offset negative effects and these are achieved by preservation in-situ (avoidance), by design and / or by record.

Archaeological testing will be guided by the results of the geophysical survey. In areas where geophysical survey could not take place due to unsuitable ground conditions and access issues, archaeological testing will take place in advance of construction, to confirm the design approach.

Archaeological monitoring will be undertaken in order to establish the presence or absence, as well as the nature and extent, of any archaeological deposits, features or sites that may be present within the land-take of the Project. If archaeological features are identified, provision (time and funding) will be made available for the full recording and, if necessary, excavation of the archaeological material in compliance with any measures that the DHLGH and the relevant local authority deem appropriate.

Mitigation measures shall be undertaken as directed by the Minister of the Department of Housing, Local Government and Heritage (DHLGH) in compliance with the code of practice, national policy guidelines and statutory provisions for the protection of archaeology and cultural heritage.

20.4 Residual Effects

Archaeological and cultural heritage issues will be resolved by mitigation during the pre-Construction Phase or Construction Phase, in advance of the Operational Phase, therefore there will be no significant residual effects upon the archaeological and cultural heritage resource.

21. ARCHITECTURAL HERITAGE

21.1 Introduction

The architectural heritage assessment identifies and assesses the likely significant effects that the Construction and Operational Phases of the Proposed Development will have on architectural heritage. The assessment is based on a desk study of published and unpublished documentary and cartographic sources. A review of existing documentation and supplementary research and field surveys has taken place where necessary in order to evaluate the architectural heritage constraints in terms of avoidance and mitigation measures. The area examined included 50m around the Proposed Development boundary.

21.2 Receiving Environment

The Proposed Development is largely confined to the existing railway corridor. The study area contains features associated with the Dublin and Drogheda Railway. The railway line between Dublin and Drogheda was built by the Dublin and Drogheda Railway (D&D Railway) and reached Drogheda from Dublin in 1844. The Howth Branch was completed by May 1847. The D&D Railway eventually extended to link Dublin and Belfast, with the completion of the Boyne crossing in 1855, merging to form the Great Northern Railway of Ireland (GNR(I)) in 1876. While some of the old line has been replaced over the years, the route has been in operation since the mid-nineteenth century.

The Proposed Development lies within the administrative areas of Dublin City Council, Fingal County Council, Meath County Council and Louth County Council. Within each of these areas there are buildings and other structures of architectural heritage significance, and these have been divided into four categories for the purpose of this assessment:

- Buildings and other structures that have been included in the record of protected structures for the relevant planning authority or where they are proposed protected structures, and these have legal protection under the planning acts;
- National Inventory of Architectural Heritage (NIAH) includes a number of other buildings and structures that are not protected but have been identified as being of architectural heritage significance, with a presumption that they may become protected structures;
- Surveys of industrial heritage carried out by the planning authorities have identified structures of industrial heritage significance that are not included in either of the previous two categories; and
- Some structures have been identified as being of potential architectural heritage significance through historic mapping and inspection that are not included elsewhere.

The architectural heritage assessment has identified 146 structures/features and landscapes of architectural heritage significance, or potential significance within an area that extends to 50m beyond the boundary of the Proposed Development.

In the absence of the Proposed Development, it is anticipated that the architectural heritage that forms part of the railway system would continue in use.

21.3 Potential Impacts and Mitigation Measures

The main potential impacts on architectural heritage during the Construction Phase will include:

- Direct impacts to bridges, viaducts, boundary walls, and the canopy over the one of the platforms at Drogheda Station where the widening of the line or OHLE infrastructure is required;
- Indirect impacts as a result of the potential for accidental damage to protected structures in areas where the construction works for the Proposed Development come into close contact with these structures; and
- Visual impacts on the setting of protected structures or buildings or structures of architectural heritage interest, and views which will temporarily impact on their amenity value during the Construction Phase.

The measures proposed to avoid or reduce negative impacts on architectural heritage during the Construction Phase will include appropriate recording, removal, protection, storage and reinstatement. For the Construction Phase, in some cases a certain amount of mitigation can be achieved through design, such as the selection of an appropriate means of raising bridge parapets (which will be informed by a conservation architect), and the recording of structures that are to be demolished, while not preserving the structures, can ensure that knowledge of their existence and character is preserved for the future.

The main potential impacts on architectural heritage during the Operational Phase will be impacts associated with visual changes on architectural heritage resources (including from proposed alterations to bridges and the installation of OHLE infrastructure), as well as impacts on the setting of these resources.

For the Operational Phase, there is no scope for mitigating the indirect effects of the Proposed Development on architectural heritage, as the effects all arise from the ongoing presence of the OHLE and its impact on the character or setting of each structure of architectural heritage significance.

21.4 Residual Effects

The residual effect of the Proposed Development will be the effect of the OHLE on the character and settings of a number of structures of architectural heritage significance.

22. ELECTROMAGNETIC COMPATIBILITY AND STRAY CURRENT

22.1 Introduction

This assessment identifies and assesses the potential impacts of electromagnetic fields (EMFs) and stray currents associated with the electrification works between Malahide and Drogheda for the Proposed Development. The assessment discusses the basis of EMFs, their impact on electrical equipment and human exposure, as well as relevant legislation, policy, and guidance. It also addresses standards and guidelines related to electromagnetic compatibility (EMC) in railway applications.

Standards and guidelines related to EMC in railway applications are discussed in detail. These include standards such as EN 50121-3-1, EN 50121-3-2, EN 50121-4, EN 50121-5, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 50122-1, and EN 50122-2. The chapter also covers policy and guidance related to EMC, providing a comprehensive overview of the regulatory framework.

The methodology used to assess the impact of the Proposed Development on the baseline environment is described. This includes the assessment of limit values for human exposure and equipment in different environments. The study area is outlined, along with the assessment methodology used to evaluate its impact. The baseline environment is characterised, and receptors are categorised based on their importance and sensitivity. The consultation process with stakeholders is also highlighted.

Baseline surveys and measurements were conducted to assess electromagnetic compatibility and stray current. The document reports that the steady-state magnetic field exposure for railway equipment was found to be below the immunity levels specified for equipment in trackside and traction substation environments. Measurements of DC magnetic fields, AC electric and magnetic fields, and radiofrequency radiated fields showed no unusually elevated electromagnetic field levels.

22.2 Receiving Environment

Electromagnetic field measurements were taken at various locations in Gormanston, Donabate, and Malahide. These measurements include DC magnetic fields, AC electric and magnetic fields, and radiofrequency radiated fields. The results indicate the levels of electromagnetic fields at different frequencies in these areas.

22.3 Potential Impacts and Mitigation Measures

Finally, the chapter assesses the potential impacts of electromagnetic compatibility and stray current during the Construction and Operational Phases.

During construction there are not expected to be any large-scale electrical installations that could generate significant levels of EMI such as traction substations or the operation of additional high voltage or high current carrying cables. Therefore, the electromagnetic activity during the Construction Phase of projects like this tends to be minimal.

No impacts on the public from an EMI, EMF or stray current perspective are envisaged during the Construction Phase of the Proposed Development. The operation of the electrified line including the OHLE and support systems will be in-line with current best practices in relation to design and installation. Similar projects such as the existing DART and Luas currently operate well inside the guideline limits on human exposure to EMF. No impacts on public health from EMF are envisaged during the Operational Phase of the Proposed Development.

23. HUMAN HEALTH

23.1 Introduction

The impact appraisal under the heading of Human Beings, Population and Human Health is a broad ranging topic which *"covers the existence, activities and health of people, usually considering people as groups or 'populations'"* (EPA 2022)[2]. Aspects examined primarily relate to impacts from the proposed road development on socio-economic activities and on local community health, each of which is outlined below.

23.2 Receiving Environment

Human health impacts are primarily considered through an assessment of the environmental pathways by which health can be affected such as air, noise, water or soil. Therefore, the health assessment relies on the assessments and draws on the findings as necessary to ensure that the effects arising from impacts associated with other disciplines may have a health impact. Such may arise from a link to impacts on contaminated lands under the Land and Soils chapter, to impacts on groundwater identified under the Hydrogeology chapter, to any potential impacts on surface water and areas of flood risk identified under the Water chapter, and to the predicted air quality impacts and noise impacts at properties adjacent to the Proposed Development.

The health assessment also considers physiological effects, health improvement and improvement to services. Other aspects, such as changes in traffic flows have also been considered in relation to the assessment of socio-economic and health impacts to ensure that the effects of these issues on human beings, population and human health have been addressed.

23.3 Potential Impacts and Mitigation Measures

Extensive mitigation is outlined elsewhere in the EIAR. This includes for example mitigation in relation to noise and air quality during the Construction Phase. No additional mitigation in terms of human health is proposed.

23.4 Residual Effects

The assessment can be summarised in that there will be some effects in relation to noise and air quality particularly, during the Construction Phase. However, with the mitigation proposed it is assessed that these effects will not give rise to a significant level in terms of human health.

During the Operational Phase the impacts on human health are assessed as significantly positive as it will provide a sustainable safe and efficient means of transport for people to work, education and social activities. It will also facilitate improved access to services.

[2] Extracted from the Advice Notes for Preparing Environmental Impact Statements (EPA draft September 2015) which have not been updated since

24. MAJOR ACCIDENTS AND DISASTERS

24.1 Introduction

Major Accidents and Disasters considers the potential for the Proposed Development to cause major accidents and disasters, and also the Proposed Developments vulnerability to negative impacts of potential major accidents and disasters e.g. flooding during its Construction and Operational Phase. This assessment differs from the other specialist chapters in that it does not deal with likely significant effects but is instead focussed on sudden events of low likelihood, which may conceivably occur, and which would result in major negative impacts on infrastructure, human health, cultural heritage and/or the environment (events of “low likelihood but potentially high consequence”).

24.2 Potential Impacts and Mitigation Measures

From examining all potential risk events associated with the proposed DART+ Coastal North project, scenarios that were considered to be of the highest risk in terms of project vulnerability and its potential to cause such an event include but are not limited to the following:

- Construction Phase: Major road traffic events, events leading to structural collapse / damage, ground collapse, water pollution events, fire / explosion, industrial accidents, accident at Seveso site, extreme weather (flooding events) and animal and plant disease.
- Operational Phase: rail accidents / train derailment events, and events leading to building failure / fire, extreme weather (flooding events), accident at Seveso site.

In the first instance the assessment considered mitigation by design (where appropriate) to reduce risk to as low as reasonably practicable. Where mitigation by design was not sufficient to reduce the risk to acceptable levels, secondary mitigation measures have been specified. These include emergency response planning, traffic management, training, implementation of technical design and operating standards and inspections.

24.3 Residual Effects

Significant residual effects are not likely to occur during Construction or Operational Phases of the Proposed Development once the identified design measures and secondary measures are applied.

25. INTERACTIONS

In addition to the assessment of impacts on individual environmental topics, the potential interactions between these factors have also been considered as part of the assessments. Table 25-1 shows the principal interactions / interrelationships identified for the Proposed Development. The nature and magnitude of all identified interactions / interrelationships was assessed under the inter-related environmental topics and mitigation measures applied where required.

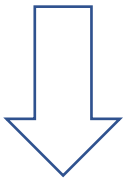
Table 25-1 Interactive Effects Summary Matrix Identifying Interactions Between Factors

	Traffic & Transport		Population		Biodiversity		Land & Soils		Water		Hydrogeology		Air Quality & Climate		Noise & Vibration		Landscape & Visual		Ag & Non-Ag		Utilities, Resource & Waste Mngt		Built Heritage		EMF		Human Health	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Traffic and Transport																												
Population	✓	✓																										
Biodiversity	✓	✓	X	X																								
Land & Soils	X	X	X	X	✓	✓																						
Water	✓	✓	X	X	✓	✓	✓	✓																				
Hydrogeology	X	X	X	X	✓	✓	✓	✓	✓	✓																		
AQ & Climate	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X																
Noise & Vibration	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	X														
Landscape & Visual	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	X	X	X												
Ag & Non-Ag	X	X	X	X	✓	✓	X	X	X	X	X	X	X	X	X	X	✓	✓										
Utilities, Resource & Waste Mgmt	✓	✓	X	X	X	X	✓	X	X	X	X	X	X	X	X	X	✓	X	X	X								
Built Heritage	X	X	X	X	✓	X	X	X	X	X	X	X	X	X	X	X	✓	✓	X	X	X	X						
EMF	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	✓	X	X				
Human Health	✓	✓	✓	✓	X	X	X	X	X	X	X	X	✓	✓	✓	✓	X	X	X	X	X	X	X	X	✓	✓		

26. CUMULATIVE EFFECTS

Cumulative effects result from the addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects. Additional cumulative effects can be caused due to incremental changes by other past, present or reasonably foreseeable projects together with the Proposed Development. There is no established study area for the assessment of cumulative effects. The study area for the cumulative assessment takes into consideration the previously defined study areas for each environmental factor which have been informed by appropriate guidance documents, best practice and professional judgement and having regard to the location, nature, characteristics and stage of planning of the other projects and plans relative to the proposed DART+ Coastal North Project. Two types of potential cumulative effects have been considered as shown in Table 26-1 below.

Table 26-1 Tiered Approach to Identifying and Assessing Potential Cumulative Effects

Tier	Description	Level of Detail
Tier 1	Existing or approved projects (Staged approach) Plans or programmes to include relevant land use, planning and transport plans/strategies relevant to the Proposed Development	Decreasing level of detail likely to be available. 
Tier 2	'Other' identified projects including NTA projects that are in the public domain/at preliminary design i.e., not active/granted but have the potential for cumulative effects with the Proposed Development	

The methodology for this tiered approach is described in the sections below.

Tier 1 – Methodology for Assessment

Tier 1 includes the assessment of existing and/ or approved plans/programmes or projects.

Identification of Plans and Programmes

A list of relevant national, regional, and local plans and programmes identified as having the potential to have a cumulative effect with the Proposed Development was collated. The Plans and Programmes for inclusion in the cumulative effects assessment (CEA) align with the Planning Report which accompanies the Railway Order application.

Identification of Existing and / or Approved Projects

To identify and assess the likely significant cumulative effects with existing and/or approved projects, a four-stage approach was adopted which is informed by Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects, published in 2019 by the Planning Inspectorate, an executive agency of the Ministry of Housing, Communities and Local Government of the United Kingdom (MHCLG, 2019) hereafter referred to as 'Advice Note 17'.

The four stage approach is summarised in Image 26-1.

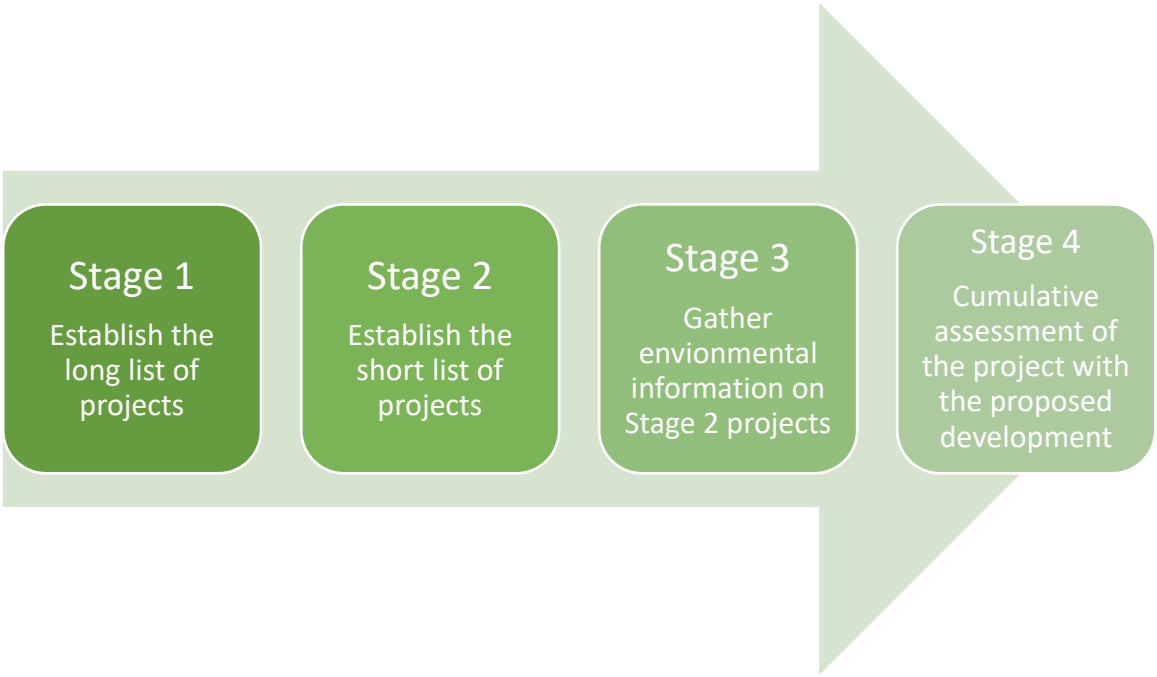


Image 26-1 Staged approach for Tier 1 cumulative assessment

A description of each of the four stages is presented in Chapter 26 (Cumulative Effects) in Volume 2 of this EIAR.

Tier 2 – 'Other' Projects

'Other' identified projects that are in the public domain/at preliminary design (i.e., not in the planning system or granted) but have the potential for cumulative effects with the Proposed Development are also assessed as part of the CEA. This includes other projects such as the other DART+ Programme projects and relevant NTA/TII projects. The project team is aware of, and familiar with, several of the other relevant NTA funded projects that are currently at public consultation and/or are in the public domain, for example. The project team is also aware of other large scale projects (outside of those referenced above) which may interact with the Proposed Development. There is no legal requirement to assess these projects. It was deemed prudent however, to include, within the CEA, those projects that are reasonably foreseeable and are likely to have cumulative effects with the DART+ Coastal North Project.

A separate matrix for these 'other projects' has been created for the assessment. The assessment information depends on the stage of the Proposed Development, and these projects are likely to have limited and differing levels of environmental information available that can be used to inform the likely significant effects of this CEA.

At the time of completing this EIAR, the identified 'Tier 2' projects will be in the process of seeking statutory approval and/ or will be at early stages of design. Therefore, there is likely to be differing levels of environmental information available to the public and it is unlikely that there will be a published EIAR available to consider as part of the CEA. The CEA is a precautionary but pragmatic approach based on the best available information where baseline data is not available or is incomplete. Therefore, publicly available information or information made available by the delivery agents of the individual projects has informed the respective Tier 2 assessments.

The Tier 2 projects include the following:

- DART+ West;
- DART+ South West;
- DART+ Coastal South ;
- Metrolink;
- Luas Finglas;
- North Irish Sea Array Offshore Wind Farm;
- Dundalk Active Travel Project;
- ESB electricity supply connections (from proposed substations to the ESB network);
- DART Station Enhancement Project;
- Multimodal Interchange Project;
- DART Platform Accessibility Project;
- Iarnród Éireann Carparks Programme.

The cumulative assessments undertaken under each of the two tiers is presented in Chapter 26 (Cumulative Effects) in Volume 2 of this EIAR.

27. SCHEDULE OF ENVIRONMENTAL COMMITMENTS

The Schedule of Environmental Commitments presents a summary of the mitigation and monitoring measures identified as a result of undertaking the environmental impact assessments, as well as the mitigation measures detailed in the Natura Impact Statement which has been carried out to inform the Appropriate Assessment Process. From the inception of the design and environmental assessment process of the Proposed Development, the project team has strived to avoid, prevent and reduce adverse effects through thoughtful design development and this is incorporated into the design drawings and specifications of the Proposed Development that have been assessed as part of this EIAR. Avoidance of impacts is most applicable at the earliest stages of a project, whilst prevention has taken place during the design and environmental assessments process between the design team and EIA team. Mitigation is a last resort and can include a remedy or offsetting adverse effects. For example, this can apply when projects cannot avoid significant effects due to their need to locate on a particular site, etc. Where likely significant environmental effects have been identified during the environmental impact assessment process, measures have been proposed to mitigate these effects as much as reasonably possible, with any residual effects identified in the relevant chapters of this EIAR. The objective of the Schedule of Commitments is to provide a central location where all measures from the EIAR and NIS are presented together for both ease of reference and inclusion in the contract documents at a later stage of the Proposed Development. All of the mitigation and monitoring commitments in Chapter 27 (Summary of Mitigation and Monitoring Measures) in Volume 2 of this EIAR are incorporated into Appendix A5.1, the Construction Environmental Management Plan (CEMP), in Volume 4 of this EIAR, submitted as part of the Railway Order application.

Appendix A: Schematics