Appendix A1.1
EIA Scoping Report

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GLOSSARY OF ABBREVIATIONS AND TERMS

Acronym	Definition
µT	units of microTesla
AA	Appropriate Assessment
AADT	Average Annual Daily Traffic
ABP	An Bord Pleanála
AC	Alternating Current
ACA	Architectural Conservation Area
AERMOD	Air quality Dispersion modelling system
ATC	Automatic Traffic Counts
AWB	Artificial waterbody
BoCCI	Birds of Conservation Concern
BMP	Best Management Practices
BSBI	Botanical Society of Britain & Ireland
CAF	Common Appraisal Framework
CIÉ	Córas Iompair Éireann
CIEEM	Chartered Institute of Ecology and Environmental Management
CO	Benzene and Carbon Monoxide
CPO	Compulsory Purchase Order
CRR	Commission for Railway Regulation
CSEA	Clifton Scannell Emerson Associates
CSO	Central Statistics Office
DART	Dublin Area Rapid Transit
dB	Decibel
DC	Direct Current
DCC	Dublin County Council
DMURS	Design Manual for Urban Road and Streets
ED	Electoral Divisions
EMC	Electromagnetic Compatibility
EMF	Electromagnetic Fields
EMI	Electromagnetic Interference
ESB	Electricity
FRA	Flood Risk Assessment
GDA	Great Dublin Area
GES	Good Ecological Status
GHG	Greenhouse Gas
GHz	Gigahertz
GIS	Geographic information system
GSI	Geological Survey Ireland
GWB	Ground Water Body
HGV	Heavy Goods Vehicle
HSA	Health and Safety Authority
HSE	Health Service Executive
IAQM	Institute of Air Quality Management

Acronym	Definition
IAS	Invasive alien species
ICNIRP	International Commission on Non-Ionising Radiation Protection
IÉ	Iarnród Éireann
I-WeBS	Irish Wetland Bird Survey Site Inventory
Kt CO_2eq	Kiloton Carbon dioxide equivalent
LAP	Local Area Plan
LAWCO	Local Authority Waters and Communities Office
MASP	Metropolitan Area Strategic Plan
MCA	Multi- Criteria Analysis
MCDP	Meath County Development Plan
MRI	Magnetic Resonance Imaging
Mt CO_2eq	Metric ton Carbon Dioxide equivalent
NBDC	National Biodiversity Data Centre
NDP	National Development Plan
NHA	Natural Heritage Areas
NIAH	National Inventory of Architectural Heritage
NIFTI	National Investment Framework for Transport in Ireland
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxide
NPF	National Planning Framework
NPWS	National Parks & Wildlife Service
NRA	National Roads Authority
NSO	National Strategic Objectives
NTA	National Transport Agency
OHLE	Over-head electricity lines
OPW	Office of Public Works
OSi	Ordnance Survey Ireland
PAC	Pre-application Consultations
pFRA	Preliminary Flood Risk Assessment
PLUTO	Planning Land Use and Transport Outlook 2040
PM_{10}	Particulate matter 10
$PM_{2.5}$	Particulate matter 2.5
pNHA	Proposed National Heritage Area
PSO	Public Service Obligation
RF	Radiofrequency
RO	Railway Order
RPG	Regional Planning Guidelines
RPS	Record of Protected Structures
RSES	Regional Spatial and Economic Strategy
RTP	Rural transport programme
SAC	Special Areas of Conservation
SEMs	Scanning Electron Microscopes
SET	Signalling, Electricity, Telecommunications

Acronym	Definition
SFRA	Strategic Flood Risk Assessment
SIFLT	Strategic Investment Framework for Land Transport
SO2	Sulphur dioxide
SPAs	Special Protection Areas
TII	Transport Infrastructure Ireland
UKAS	United Kingdom Accreditation Service
V/m	units of volts per meter
WFD	Water Framework Directive

EXECUTIVE SUMMARY

The DART+ Coastal North project is the third infrastructure project to launch as part of the DART+ Programme.

The DART+ Coastal North project primarily involves the extension of the existing electrified rail network over circa 37km from Malahide to Drogheda, with associated re-signalling and modification of some low clearance overbridges to accommodate the overhead line electrification system. There will also be modifications to existing depots at Drogheda and Fairview to support the new DART+ Fleet. As a principle, the project is seeking to contain works, insofar as possible, within the existing railway corridor; however, some infrastructure such as traction power substations will need to be constructed outside of the railway corridor where space cannot be found.

The project will provide the infrastructure to facilitate a significant increase to the rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station, including the Howth Branch, by implementing an extended electrified railway network with higher-capacity and higher-frequency DART trains. The DART+ Coastal North project will serve all existing stations along the railway corridor between Dublin City Centre and Drogheda, including those located on the Howth Branch, using electrical power that has a lower carbon footprint than existing diesel trains.

To achieve this increased capacity and enable a higher frequency of DART services, the DART+ Coastal North project will require track modifications, 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 allowing trains to be turned back clear of continuing services on separate tracks at Clongriffin and Malahide Stations.

Works at Clongriffin involve the construction of some additional tracks to the east of the station. The original station construction anticipated this construction requirement and therefore it will have minimal impact on the station building/existing infrastructure.

Additional turnback tracks at Howth Junction & Donaghmede Station will allow for a higher frequency and a more reliable service. A platform extension will be constructed at Howth Junction & Donaghmede Station to provide direct access between terminating services on the Howth Branch and southbound DART services to the city centre. Design interventions will also be carried out to address concerns raised during the Public Consultation No. 1, particularly in relation to customer safety, comfort, and user experience.

At Drogheda MacBride Station the existing track and depot layout does not provide sufficient operational capacity to meet the planned increase in number of train services. Consequently, track and depot alterations are required, along with associated alterations to signalling, electrification, telecoms and structures. This includes the installation of a new platform.

To achieve peak capacity increases proposed by the DART+ Programme, DART+ Coastal North will seek a reconfiguration of Howth Junction & Donaghmede Station to provide the infrastructure that will enable the use of a rail shuttle service on the Howth Branch. Design interventions proposed will include significant modification works to accommodate the proposed Howth shuttle service and improve the passenger experience generally. This will involve modifying the entrances to create a more inviting and safer environment as well as improve the connection to the surrounding areas of

Donaghmede and Kilbarrack. Upgrades will also take place to the footbridge and connections to the centre platforms, as well as the lighting, signage, and finishes throughout.

By removing crossing conflicts at Howth Junction, a shuttle DART operation between Howth and Howth Junction & Donaghmede stations will maximise frequency and reliability on the Northern line. The interchange at Howth Junction & Donaghmede Station will be facilitated by an increase in Northern Line stopping trains from 6 to 11.

The removal of crossing conflicts at Howth Junction will also result in a more frequent and reliable Howth DART service to every ten minutes each way, with a change at Howth Junction & Donaghmede Station to access the Northern Line. This would represent an increase to a maximum of six trains per hour per direction from the current three. Final operational decisions will be made subject to demand requirements and assessment.

The effect of the proposed changes to the Howth Branch on the barrier opening times of level crossings has been assessed for a variety of timetable scenarios. The assessment to date concludes that the crossings can continue to operate and provide an appropriate level of cross connectivity and accessibility whilst still meeting the increased DART service frequency requirement. There may be additional delays at level crossings for motorists, pedestrians and cyclists, and some additional queuing for motorists, however this is unlikely to extend onto adjacent junctions. Further assessment will be undertaken as part of the EIA process and presented in the EIAR

Iarnród Éireann (IÉ) is currently assessing and refining the options to determine the Preferred Options for all aspects of the project. As part of this process IÉ will liaise with statutory consultees and seek opinions from the public to take forward an optimal design (preferred option) in a Railway Order Application.

The application for a Railway Order requires the preparation of an Environmental Impact Assessment Report as prescribed in Section 37 of the Transport (Railway Infrastructure) Act 2001 (as amended). IÉ are preparing an Environmental Impact Assessment Report (EIAR) which complies with the Railway Order legislation, the requirements set out in S.I. 296 of 2018: European Union (Planning and Development) (Environmental Impact assessment) Regulations 2018 and to ensure the requirements of 2014/52/EU on the assessment of the effects of certain public and private projects on the environment are met.

The EIA screening exercise has determined that the proposed railway works are a mandatory development requiring an EIA.

Scoping is a key stage of the EIA process and is used to inform the scope and level of detail of the information to be contained within the EIAR. To that end, this EIA Scoping Report includes:

- a description of the proposed project;
- a description of the potential significant impacts which are likely to arise during construction and operation of the proposed project; and
- an outline of the proposed methods for assessment of the potential impacts.

This EIA Scoping Report sets out the proposed contents of the EIAR. It is envisaged that the EIAR will be presented in four volumes as follows:

- Volume 1: Non-Technical Summary;
- Volume 2: Environmental Impact Assessment Report (EIAR) – Main Text;
- Volume 3A: Technical Figures;
- Volume 3B: Photomontages; and
- Volume 4: Appendices.

The aspects of the environment to be assessed ('environmental factors') are in accordance to Directive 2014/52/EU which was transposed into Irish Law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018.

IÉ are now inviting submissions on this EIA Scoping Report and would like your views having regard to the following:

- Is the scope of the proposed assessment for the environmental assessments adequate?
- Are there any additional environmental issues or data sources that should be taken into consideration as part of the preparation of the EIAR?
- Are there any other environmental issues that should be considered as part of the preparation of the EIAR?

A submission or observation in relation to the scope and/or level of detail of the information to be included in the EIAR may be in writing to IÉ within 6 weeks from the date of this scoping notice. Please send any submissions or observations marked '**DART+ Coastal North – EIA Scoping Consultation**' in writing to the address below:

Email: DARTCoastalNorth@irishrail.ie

Postal Address:

Community Liaison Officer,
DART+ Coastal North,
Iarnród Éireann,
Inchicore Works,
Inchicore Parade,
Dublin 8,
D08 K6Y3.

All feedback received during the scoping process will be considered by the IÉ and the project team and the EIAR scope updated as required. The EIAR will summarise issues raised during Scoping and how they have been addressed in the EIAR.

1. INTRODUCTION

1.1 Introduction

The Environmental Impact Assessment (EIA) screening exercise undertaken has determined that the proposed project is a project that requires a mandatory Environmental Impact Assessment. This is defined under the Transport (Railway Infrastructure) Act 2001 (S.I. No. 55 of 2001) as amended. Therefore, an Environmental Impact Assessment Report (EIAR) will be prepared to accompany the application for a Railway Order (RO).

This report is the Environmental Impact Assessment (EIA) Scoping Report. 'Scoping' is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. The Scoping stage provides an opportunity to consult with stakeholders about the extent of the information required to be contained within the EIAR.

The key objectives of this Scoping Report are:

- Provide a description of the proposed project;
- Identify likely significant impacts which may arise during construction and operation of the proposed project that will be assessed in the EIAR;
- Outline proposed assessment methodologies for completing the assessments;
- Outline the likely contents of the EIAR; and
- Form a basis of common reference for consultation about the scope and methodology for the EIAR.

On the basis of the information provided in this EIA Scoping Report views are being sought on the scope and level of detail that should be considered in the EIAR, including any additional environmental issues or alternative methodologies that should be taken into consideration when preparing the EIAR.

1.2 Report Structure

This EIA Scoping Report is structured as follows:

- **Section 1**: Introduction, Project Overview and Project Team.
- **Section 2**: Background to the proposed project and the need for the scheme.
- **Section 3**: Provides a description of the proposed project.
- **Section 4**: Provides an outline of the EIA process and the proposed project methodology to be used.
- **Section 5 – 23**: Provides a description of the possible effects of the proposed project on the environment to inform the scoping opinion for each of the EIA environmental factors.
- **Section 24**: Outlines the interactions between the potential effects identified. It also outlines the methodology to be used in assessing possible cumulative impacts between the proposed project and other projects which may be taking place concurrently or consecutively.
- **Section 25**: Provides a concluding statement for the EIA Scoping Report.

1.3 Project Overview

DART+ Coastal North is seeking to extend the existing electrified rail network from Malahide to Drogheda as well as providing the infrastructure to increase rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station, including the Howth Branch. A full description of the Project can be found in Section 3. The extents of the DART+ Coastal North project are presented in Figure 3-1.

1.4 Current Status

The project is currently at options selection stage. The Emerging Preferred Option (EPO) for the proposed project where available was published in February 2022. Following Public Consultation No. 1, the feedback has been analysed and is feeding into the update of the option selection process leading to the identification of the Preferred Option which will be published as part of Public Consultation No. 2 in Q2 2023. The feedback gathered from the public, other relevant stakeholders, as well as ongoing studies will feed into the preparation of the final design, the preparation of the EIAR and the Railway Order (RO) application to An Bord Pleanála (ABP).

1.5 Project Team

Iarnród Éireann (IÉ) has commissioned Arup to develop a preliminary design and to prepare the Railway Order for the project. The EIAR is being prepared by Arup with inputs from competent experts under a number of disciplines as detailed in Table 1-1.

Table 1-1 Details of Competent Experts

Topic	Specialist Contributors	Company	Qualifications	Experience (Years)
Chapter 1: Introduction	Clodagh O'Donovan	Arup	BE, MEngSc, CEng, FIEI, FConsEI	28
	Stephen Hyland	Arup	MSc, BSc, PIEMA	12
Chapter 2: Background to the	Clodagh O'Donovan	Arup	As above	As above
	Stephen Hyland	Arup	As above	As above
Chapter 3 Project Description	Clodagh O'Donovan	Arup	As above	As above
	Gillian Sisk	Arup	PhD, BEng, CEng MIEI	21
	Stephen Hyland	Arup	As above	As above
Chapter 4: EIA Process and Methodology	Clodagh O'Donovan	Arup	As above	As above
	Stephen Hyland	Arup	As above	As above
Chapter 5 Alternatives Considered	Clodagh O'Donovan	Arup	As above	As above
	Stephen Hyland	Arup	As above	As above
Chapter 6 Traffic and Transportation	Gerna van Jaarsveld	Arup	MSc, BSc, SA Council of Planners, Professional Planner Pr. Pln	23

Topic	Specialist Contributors	Company	Qualifications	Experience (Years)
	Tiago Oliveira	Arup	Chartered Member of CILT, Member of the Academy of Urbanism, Member of the Transport Planning Soc (TPS), Member of the TPS Committee	24
Chapter 7 Population	Dr. Craig Bullock	Optimize Consultants	PhD (Env Economics), Msc. (Env. & Natural Resources Economics), DIP (EIA)	30
Chapter 8 Biodiversity	Aebhin Cawley	Scott Cawley	BA (Hons) Zoology, DIP Physical Planning, Chartered Environmentalist, Member CIEEM, Member of IEMA	20
	Siofra Quigley	Scott Cawley	BA (Hons) Zoology, Msc.	5
Chapter 9 Land and Soils	Marie Fleming	Arup	MSc, BSc, DIC Engineering Geology, Past President of Institute of Geologists Ireland, Chair of Registration Authority of the European Federation of Geologists, Member of External Relations Committee of the Geological Society of London	20
Chapter 10 Hydrology	Gerry Baker	Arup	MSc., BA, PGeo (EurGeol), IAH Ireland (President)	20
	Rodoula Gregoriou	Arup	MEng, CEng MICE	8
Chapter 11 Hydrogeology	Christopher Newton	Arup	MSc Geology, Fellow of Geological Soc. Of London, Chartered with Geological Soc. Of London, Vice Chair of Irish Brownfield Network.	15
Chapter 12 Air Quality	Sinead Whyte	Arup	Msc., BSc., MCIWEM, Dip Acoustics & Noise Control, Chartered member of Institute of Water and Env Management, Associate Member of Institute of Acoustics (IoA).	27
Chapter 13 Climate	Sinead Whyte	Arup	As above	As above
Chapter 14 Noise and Vibration	Mhairi Riddet	Arup	Msc. (Engineering Acoustics), BSc (Civil Eng), BSc (Civil Eng), Chartered Member of the Institute of Acoustics (IoA)	12
Chapter 15 Landscape and Visual	Thomas Burns	Brady Shipman Martin	BAgrSc (Landscape), DIP EIA, Adv Dip Planning and Environmental Law	26
Chapter 16 Material Assets Agricultural Properties	Con Curtin	Curtin Agricultural Consultants	B.Agric.Sc, Level 6 Land Drainage (Teagasc)	31

Topic	Specialist Contributors	Company	Qualifications	Experience (Years)
Chapter 17 Material Assets: Non-agricultural properties	Stephen Wilkins	Arup	CEng MIEI, BA BAI (Hons), Chartered member of Engineers Ireland	17
Chapter 18 Material Assets: Utilities	Stephen Wilkins	Arup	As above	As above
Chapter 19 Material Assets: Waste Management	Janet Lynch	Arup	BE (Hons) Civil and Env Engineering, Ellen MacArthur University of Exeter Circular Economy Masterclass, FETAC Certificate in Waste Facility Management, CEng, MIEI, Chartered Resource and Waste Manager (MCIWM)	22
Chapter 20 Archaeology and Cultural Heritage	Lisa Courtney	Courtney Deery	BA (Hons), Msc. (Ag), Dipl. Bus Mgt, Member of the Institute of Archaeology Ireland (MIAI)	24
Chapter 21 Architectural Heritage	Cathal Crimmins	Cathal Crimmins	B. Arch., M. Arch. Sc., RIAI Grade I Conservation Accreditation, FRIAI, MRIBA	30
	Julia Crimmins	Cathal Crimmins	BA (Hons), MUBC, MSc (Sp)	15
Chapter 22 Electromagnetic Compatibility & Stray Current	Sergio Rapino Carmona	Ardanuy	MSc Industrial (Electromechanical) Engineer, Member of Prof. Association of Industrial Engineers, Madrid	18
Chapter 23 Human Health	Dr. Martin Hogan	Corporate Health Ireland	GP, M.B., Dip, MICGP, MRCGP, MFOM, FFOM, FRCPI, Specialist registration (Irish Medical Council)	20
Chapter 24 Major Accidents & Disasters	Ailsa Doyle	Arup	BSc., MSc (Planning and Urban Leadership)	7
Chapter 25 Interactions	Clodagh O'Donovan Stephen Hyland	Arup	As above	As above
Chapter 26 Cumulative Impacts	Clodagh O'Donovan Stephen Hyland	Arup	As above	As above
Chapter 27 Mitigation and Monitoring Measures	Clodagh O'Donovan Stephen Hyland	Arup	As above	As above

2. BACKGROUND TO THE PROJECT / NEED FOR THE SCHEME

2.1 Introduction

The DART+ Programme is a transformative railway investment programme that will deliver a high quality and integrated public transport system within the Greater Dublin Area (GDA). The DART+ Programme will both modernise and improve the existing rail services in the GDA, providing a range of benefits for both the residents of the GDA itself, as well as those living in surrounding regions.

The DART+ Programme will play a significant role in contributing to Ireland's transition to a low carbon and climate resilient society by providing a sustainable, electrified, reliable and more frequent rail service with improved capacity to meet current and future demands. This will be achieved through the modernisation of existing railway corridors and by utilising electric powered trains in place of diesel trains.

The existing, electrified DART network extends from Malahide to Greystones (including the Howth Branch) over a length of approximately 50km. The DART+ Programme will seek to increase the length of high capacity and electrified network to 150km across the four main rail corridors within the GDA. See Figure 2-1 for a schematic of the overall DART+ Programme.

The modernisation includes the electrification, re-signalling and other specific interventions to remove constraints across the four main rail corridors within the GDA, as follows:

- **DART+ Coastal North (this project**) – circa 50km, extending from Drogheda to Dublin City Centre (north of Connolly Station).
- DART+ Coastal South – circa 30km, extending from Greystones to Dublin City Centre.
- DART+ West – circa 40km, extending from Maynooth and M3 Parkway stations to Dublin City Centre.
- DART+ South West – circa 16km, extending from Hazelhatch & Celbridge Station to Heuston Station and also circa 4km between Heuston Station and Glasnevin, via the Phoenix Park Tunnel Branch Line.

As part of the DART+ Programme, Iarnród Éireann is purchasing a new fleet of trains to enhance the capacity on the DART network. This procurement will allow Iarnród Éireann to choose a fleet made up of Electric Multiple Units (EMUs) and Battery Electric Multiple Units (BEMUs). The provision of BEMUs will allow for running enhanced services on the network between Drogheda and Dublin City Centre in advance of full electrification.

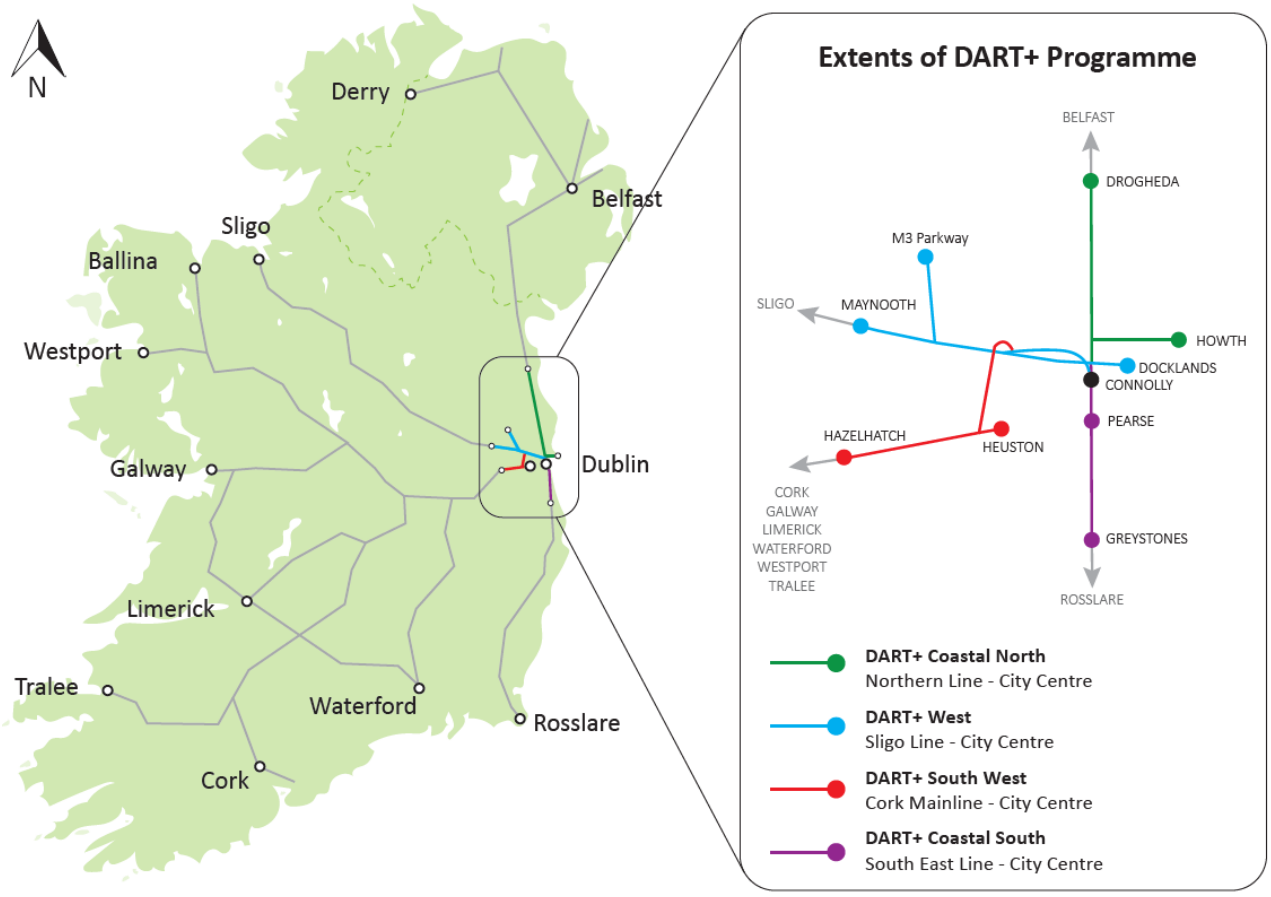

Figure 2-1 Schematic of the Overall DART+ Programme

2.2 Project History

The origins of DART+ Programme date back to the 1970s. The publication of the 'A Platform for Change' in 2001 (Dublin Transportation Office, 2001), formalised the benefit of using heavy rail as the spine of an integrated public transport scheme. Since 2001, Iarnród Éireann has progressed railway improvement projects in accordance with the objectives of DART+ as funding permitted.

Iarnród Éireann's previous priority was to deliver, as early as possible, the DART Underground tunnel link beneath the city centre. This was fundamental to increasing capacity on the radial routes. Design and planning for DART Underground was progressed and a Railway Order was approved by An Bord Pleanála in December 2011 and confirmed by the High Court in March 2014.

However, in September 2015 the Government deferred authorisation for construction of DART Underground and instructed Iarnród Éireann to examine the current design at that point with an objective of delivering a lower cost technical solution, whilst retaining the required rail connectivity for the DART+ Programme. Between September 2015 and the publication of the National Development Plan (NDP) in February 2018, IÉ & the NTA worked collaboratively in the assessment of lower cost technical solutions. A number of studies were undertaken including Transport Assessments including the Maynooth Line Transport Study (NTA 2019), the DART Expansion Rail Electrification Assessment (Iarnród Éireann 2019), the DART Underground Western Tie-In Study (NTA 2017) and Tunnel Configuration Study for new Metro North and DART Underground (NTA/IE/TII 2017).

The outcome of these studies influenced the formulation of the NDP and the decision to proceed with DART Expansion (now DART+ Programme) with non-tunnel elements and to maximise the use of the Phoenix Park Tunnel branch line.

2.3 Project Context

The DART+ Programme is central to the delivery of planning and transportation policy objectives at national, regional and local level. The policy hierarchy and the some of the relevant documents which reference and support the DART+ Programme are shown in Table 2-1.

Table 2-1 Key planning and wider policy context

European Policy
Trans-European Network for Transport (TEN-T)
National Level
Project Ireland 2040
National Development Plan 2021-2030
National Investment Framework for Transport Planning in Ireland 2021
Smarter Travel: A Sustainable Transport Future; 2009-2020
National Investment Framework for Transport in Ireland (NIFTI)
Planning Land Use and Transport Outlook 2040 (PLUTO)
Department of Transport: Statement of Strategy 2021-2023
Building on Recovery: Infrastructure and Capital Investment 2016-2021
Climate Action Plan 2023
Regional policy Level
Eastern and Midland Regional Spatial and Economic Strategy (RSES) 2019-2031
Dublin Metropolitan Area Strategic Plan (MASP)
Transport Strategy for the Greater Dublin Area 2022-2042
Great Dublin Area Cycle Network Plan
Integrated Implementation Plan 2019-2024
Local Level
Dublin City Development Plan 2022-2042
Clongriffin-Belmayne Local Area Plan
Fingal County Development Plan 2017-2023
Baldoyle-Stapolin Local Area Plan 2013
Donabate Local Area Plan 2016
Meath County Development Plan 2021-2027
East Meath LAP 2014-2020
Louth County Development Plan 2021-2027

The sections below set out the high level policy context for the proposed DART+ Coastal North project, which forms part of the DART+ Programme.

It identifies how the proposed project aligns with the European, national, regional and local policy framework. As will be presented in further detail through the EIA, it is evident that the DART+ Coastal North project aligns with, and is in accordance with, such policy.

2.3.1 Trans European Network for Transport

The Trans-European Network for Transport (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.

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 Network for Transport. 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.

2.3.2 Project Ireland 2040

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. It is a framework to guide public and private investment, to create and promote opportunities to protect and enhance the environment.

There are 10 "National Strategic Outcomes" within the NPF which address Compact Growth, Sustainable Mobility, Transition to a Low Carbon and Climate Resilient Society. A key growth enabler for the Dublin Region is identified within the NPF 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 achievements 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.

2.3.3 National Development Plan 2021-2030

The current NDP sets out the ten-year capital ceilings which will support economic, social, environmental and cultural development across Ireland, incorporating a total public investment of €165 billion from 2021-2030. To deliver the National Strategic Outcomes set out in the NPF, the NDP identifies relevant Strategic Investment Priorities and actions.

The 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. The DART+ Coastal North project will contribute to achieving these objectives.

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

The Department of Transport has prepared and finalised the National Investment Framework for Transport in Ireland (NIFTI). NIFTI is the Department of Transport's high-level strategic framework to support the consideration and prioritisation of future investment in land transport.

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. The NIFTI notes that the National Development Plan identities DART+ as one of the infrastructure projects required in the next decade.

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

2.3.5 Smarter Travel: A Sustainable Transport Future 2009-2020 (DTTAS, 2009)

This National Government policy outlines clear targets to:

- Address the current unsustainable transport and travel patterns and to reduce the health and environment impacts of current trends;
- To deliver a sustainable transport system in line with climate change targets;
- Reduce work related commuting by car from a current modal share of 65% down to 45% by 2020; and
- Increase commuting by alternative sustainable modes to 55% by 2020.

The document further outlines a set of key goals necessary for achieving sustainability in transport. The DART+ Programme (and DART+ Coastal North) is aligned to the policy and supports the key goals necessary for achieving sustainability in transport.

2.3.6 Department of Transport: Statement of Strategy 2021-2023

The Statement of Strategy does not refer to specific projects. However, there are a number of objectives outlined in the Strategic Approach that are relevant to the DART+ Coastal North project development:

"Aligned with the National Planning Framework and the National Economic Plan we will maintain and develop high quality sustainable road, public transport and active travel networks to enable economic activity, essential services and social connections between and within our cities, regions and communities.

We will encourage and support transport networks and services that are environmentally, economically and socially sustainable, in line with the UN Sustainable Development Goals.

We will prioritise the decarbonisation of transport and low carbon technology in line with the EU Green Deal and ambitious government policies.

We will continue to invest in active travel and in our public transport networks, greenways and alternative technologies."

2.3.7 Building on Recovery: Infrastructure and Capital Investment 2016-2021

This Capital Plan published by the Department of Public Expenditure and Reform presents the Government's €42 billion framework for infrastructure investment in Ireland over the period 2016 to 2021, including a €27 billion multi-annual Exchequer Capital Investment Plan.

The €27 billion Exchequer component of the Capital Plan, supplemented by a new €500 million phase of the PPP programme, is primarily targeted at addressing priority needs in transport, education, housing and health care. The sectoral share on transport is 29%.

The plan recognises that it is essential for road, rail and public transport networks to be developed and maintained to the standard required to ensure the safe and efficient movement of people and freight, and gives particular reference to the DART+ programme in this. The DART+ Coastal North project is part of the overall strategy of improved public transport in Ireland, along the east coast in particular.

2.3.8 Climate Action Plan 2023

The Climate Action Plan 2023 sets out a detailed sectoral roadmap designed to deliver a 51% reduction in greenhouse gas (GHG) emissions by 2030. The previous Climate Action Plan 2021 targets have also been revised to meet a higher level of ambition, including a 20% reduction in total vehicle kilometres, a reduction in fuel usage, and significant increases to sustainable transport trips and modal share.

The DART+ Coastal North project will be in compliance 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.

2.3.9 Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031

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

At this strategic level it provides a framework for investment to better manage spatial planning and economic development throughout the Region.

The RSES sets out Regional Strategic Outcomes and Policies relating to 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 is in alignment with these outcomes and policies, and will assist in there delivery.

2.3.10 Dublin Metropolitan Area Strategic Plan (MASP)

The requirement for the development of MASP for Dublin City as part of the RSES is outlined in the Project Ireland 2040. The objectives of the MASP are complementary to the objectives of the RSES. Strategy requires the development of the Dublin MASP and include the management of sustainable and compact growth of Dublin City and better use of under used lands. One of the Guiding Principles for the growth of the Dublin MASP is Integrated Transport and Land use.

The MASP also contains a number of objectives for the Dublin Metropolitan Area, including the Sustainable Transport Objective to deliver the DART expansion programme.

2.3.11 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 then 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. Major projects provided for in the Strategy include:

- *Luas Cross City.*
- *The reopening of the Phoenix Park Tunnel Rail Line.*
- *The on-going roll out of cycle tracks and greenways.*
- *Metrolink;*
- *DART+ Programme.*
- *Investment in bus priority and bus service improvements – BusConnects Dublin.*
- *M7 Naas to Newbridge widening, Osberstown Interchange and Sallins Bypass.*

The strategy assesses a number of options with regard to various transport corridors in the GDA including the Dublin to Belfast Corridor. The DART+ Coastal North project is in accordance with these regional policies.

2.3.12 Integrated Implementation Plan 2019 – 2024

The NTA's Integrated Implementation Plan 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. The Plan 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, which includes the DART+ Programme.

2.3.13 Local Planning Policy

The local authorities of Dublin City Council, Fingal County Council, Louth County Council and Meath County Council have prepared County Development Plans for their respective administrative areas. The relevant Development Plans are required to be consistent with higher level planning policy and as such reference and support DART Expansion programme (now called DART+ programme). Some of the areas have also developed Local Area Plans or Masterplans which contain specific policy objectives for local areas within the counties that are relevant to the proposed project which will also be detailed and considered as part of the design and EIAR policy context. Some of the key policies/objectives that support the proposed project in the respective Development Plans are outlined in the:

- Dublin City Development Plan 2022-2028;
- Fingal County Development Plan 2017 – 2023[1];
- Meath County Council Development Plan 2021-2027;
- Louth County Development Plan 2021-2027;
- Clongriffin-Belmayne Local Area Plan;
- Baldoyle-Stapolin Local Area Plan;
- Donabate Local Area Plan; and
- East Meath Local Area Plan 2014-2020.

[1] The policies within the Fingal County Council 2023-2029 Development Plan will be considered once it is formally adopted. This plan has not been adopted at the time of writing.

3. PROJECT DESCRIPTION

3.1 Background

The third of the infrastructural projects of the DART+ Programme to be delivered will be the DART+ Coastal North project, the subject of this EIA Scoping report. The proposed project is seeking to extend the existing electrified rail network from Malahide to Drogheda as well as providing the infrastructure to enable a significant increase in rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station, including the Howth Branch. The proposed works are described in more detail in the below sections.

3.2 Project Objectives

DART+ Programme's primary objective is to support urban compact growth and contribute to reducing transport congestion and emissions in the Dublin region by enhancing the heavy rail network between Dublin City Centre and the areas of Drogheda, Maynooth, Dunboyne, Celbridge and Greystones, providing a sustainable, safe, efficient, integrated and accessible public transport service along these corridors.

Sub-objectives of the DART+ Programme include:

- Cater for existing heavy rail travel demand and support long-term patronage growth along established rail corridors in the Greater Dublin Area 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, modern vehicles and a reliable and punctual service with regulated and integrated fares.

3.3 Project Description

As detailed above, 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 are presented in Figure 3-1[2].

[2] Emerging Preferred Option Maps are available in Annex I of the PC1 information provided here: https://www.dartplus.ie/en-ie/projects/dart-north/public-consultation-round-1/dart-coastal-north-public-consultation-no-1-useful-material-and-downloads

The DART+ Coastal North project primarily involves the extension of the existing electrified rail network over circa 37km from Malahide to Drogheda, with associated re-signalling and modification of some low clearance overbridges to accommodate the overhead line electrification system. There will also be modifications to existing depots at Drogheda and Fairview to support the new DART+ Fleet. As a principle, the project is seeking to contain works, insofar as possible, within the existing railway corridor; however, some infrastructure such as traction power substations will need to be constructed outside of the railway corridor where space cannot be found.

The project will provide the infrastructure to facilitate a significant increase to the rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station, including the Howth Branch, by implementing an extended electrified railway network with higher-capacity and higher-frequency DART trains. The DART+ Coastal North project will serve all existing stations along the railway corridor between Dublin City Centre and Drogheda, including those located on the Howth Branch, using electrical power that has a lower carbon footprint than existing diesel trains.

To achieve this increased capacity and enable a higher frequency of DART services, the DART+ Coastal North project will require track modifications, 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 allowing trains to be turned back clear of continuing services on separate tracks at Clongriffin and Malahide stations.

Works at Clongriffin involve the construction of some additional tracks to the east of the station. The original station construction anticipated this construction requirement and therefore it will have minimal impact on the station building/existing infrastructure.

Additional turnback tracks at Howth Junction & Donaghmede Station will allow for a higher frequency and a more reliable service. A platform extension will be constructed at Howth Junction & Donaghmede Station to provide direct access between terminating services on the Howth Branch and southbound DART services to the city centre. To address concerns raised at Public Consultation No. 1, design interventions particularly in relation to customer safety, comfort, and user experience have been further developed at Howth Junction & Donaghmede Station. Design interventions proposed will include significant modification works to accommodate the proposed Howth shuttle service and improve the passenger experience generally. This will involve modifying the entrances to create a more inviting and safer environment as well as improve the connection to the surrounding areas of Donaghmede and Kilbarrack. Upgrades will also take place to the footbridge and connections to the centre platforms, as well as the lighting, signage, and finishes throughout

At Drogheda MacBride Station the existing track and depot layout does not provide sufficient operational capacity to meet the planned increase in the number of train services. Consequently, track and depot alterations are required, along with associated alterations to signalling, electrification, telecoms and structures. This includes the installation of a new platform.

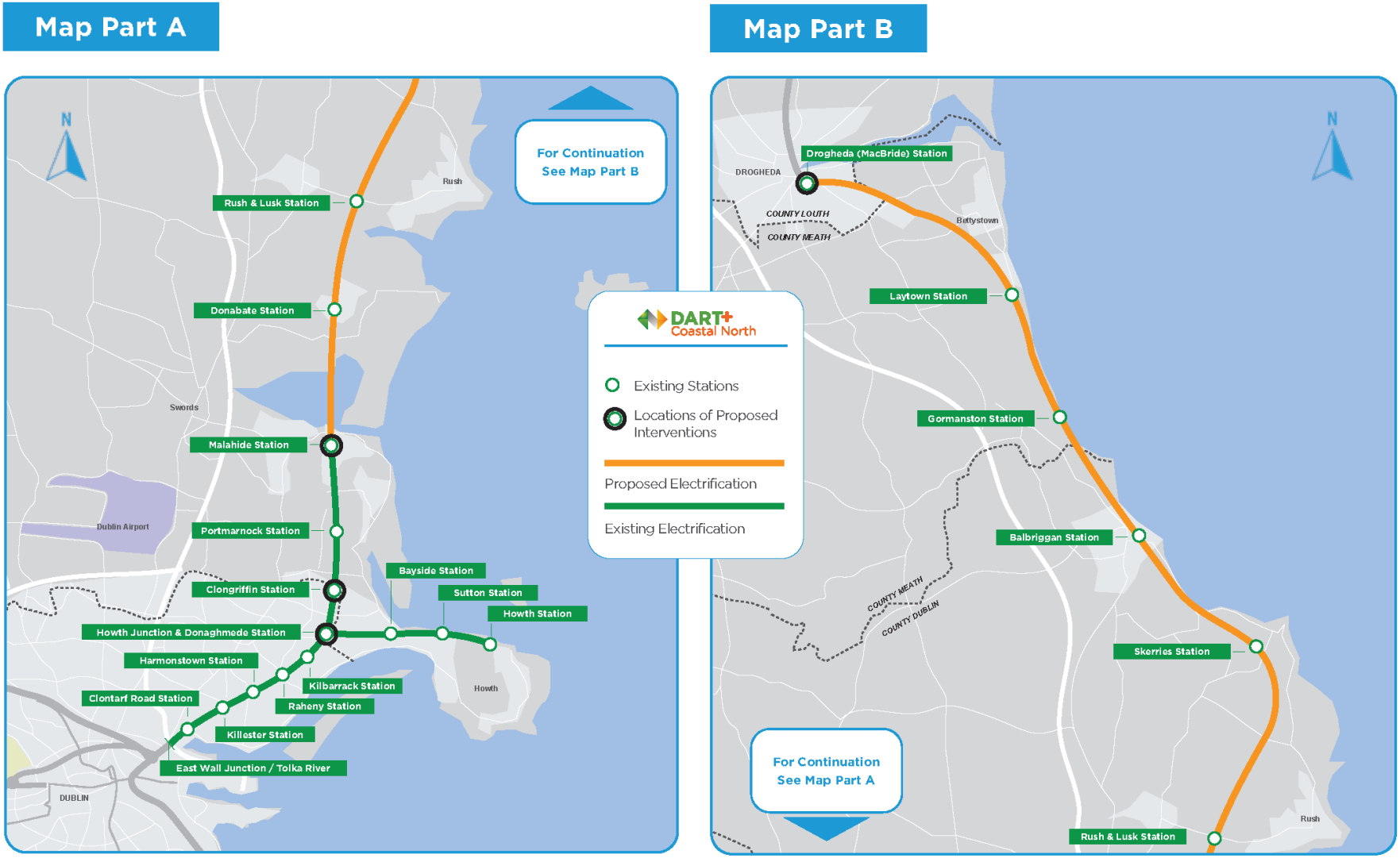

Figure 3-1 DART+ Coastal North Project Extents

To achieve the peak capacity increases proposed by the DART+ Programme, DART+ Coastal North will seek a reconfiguration of Howth Junction & Donaghmede Station to provide the infrastructure that will enable the use of a rail shuttle service on the Howth Branch. By removing crossing conflicts at Howth Junction, a shuttle DART operation between Howth and Howth Junction & Donaghmede stations will be enabled if required, to maximise frequency and reliability on the Northern Line. The interchange at Howth Junction & Donaghmede Station will be facilitated by an increase in Northern Line stopping trains from 6 to 11. The removal of crossing conflicts at Howth Junction will also enable a more frequent and reliable Howth DART service to run every ten minutes each way, with a change at Howth Junction & Donaghmede Station to access the Northern Line. This would represent an increase to a maximum of six trains per hour per direction from the current three. Final operational decisions will be made subject to demand requirements and assessment.

The effect of the proposed changes to the Howth Branch on the barrier opening times of level crossings has been assessed for a variety of timetable scenarios. The assessment to date concludes that the crossings can continue to operate and provide an appropriate level of cross connectivity and accessibility whilst still meeting the increased DART service frequency requirement. There may be additional delays at level crossings for motorists, pedestrians and cyclists, and some additional queuing for motorists, however this is unlikely to extend onto adjacent junctions. Further assessment will be undertaken as part of the EIA process and presented in the EIAR.

3.4 Capacity increase associated with DART+ Coastal North

The DART+ Coastal North project will enable improved performance and increased train frequencies in the AM and PM peaks along the full length of the Northern Line, providing enhanced capacity from the city centre to as far north as Drogheda. Customers will experience enhanced levels of service in both AM and PM peaks, and in both southbound and northbound directions (Figure 3-2).

Additionally, in DART+ Coastal North the current AM and PM peak hours will become peak periods, with DART extending the proportion of the day it provides its maximum number of trains from 1 hour to 3 hours. This extension of enhanced peak service frequencies will take advantage of infrastructure enhancements and new rolling stock, providing more flexibility, comfort, and capacity to DART customers.

During a typical morning commute, a DART customer travelling can look forward to these enhanced frequencies starting an hour earlier at 7am and ending an hour later at 10 am and similarly in the typical evening commute, a customer will benefit from the enhanced frequencies, starting an hour earlier at 4pm and ending an hour later at 7pm.

In addition to the improvements in the AM and PM peaks, DART+ Coastal customers will also benefit from increases in the number of services operating throughout the day, outside the peak periods. During both peak and non-peak times, customers will benefit from enhanced reliability, with DART able to provide a service designed to incur fewer delays, and robust enough to recover from delays when they do occur.

Note that between the current timetable and the DART+ Coastal North project, Iarnród Éireann plans to purchase Battery Electric Multiple Units trains (BEMUs). The provision of these BEMUs will allow for the possibility of running enhanced services on the network in advance of full electrification. Iarnród Éireann identified the Northern Line as the most suitable route for BEMU deployment and

Drogheda Station and depot area as the preferred charging location. These BEMU works will be delivered under a separate project and the increase in service levels provided will be in advance of the electrification under the DART+ Coastal North project. Accordingly, the increase in service level referred to in Figure 3-2 compares DART+ Coastal North to service levels post-BEMU.

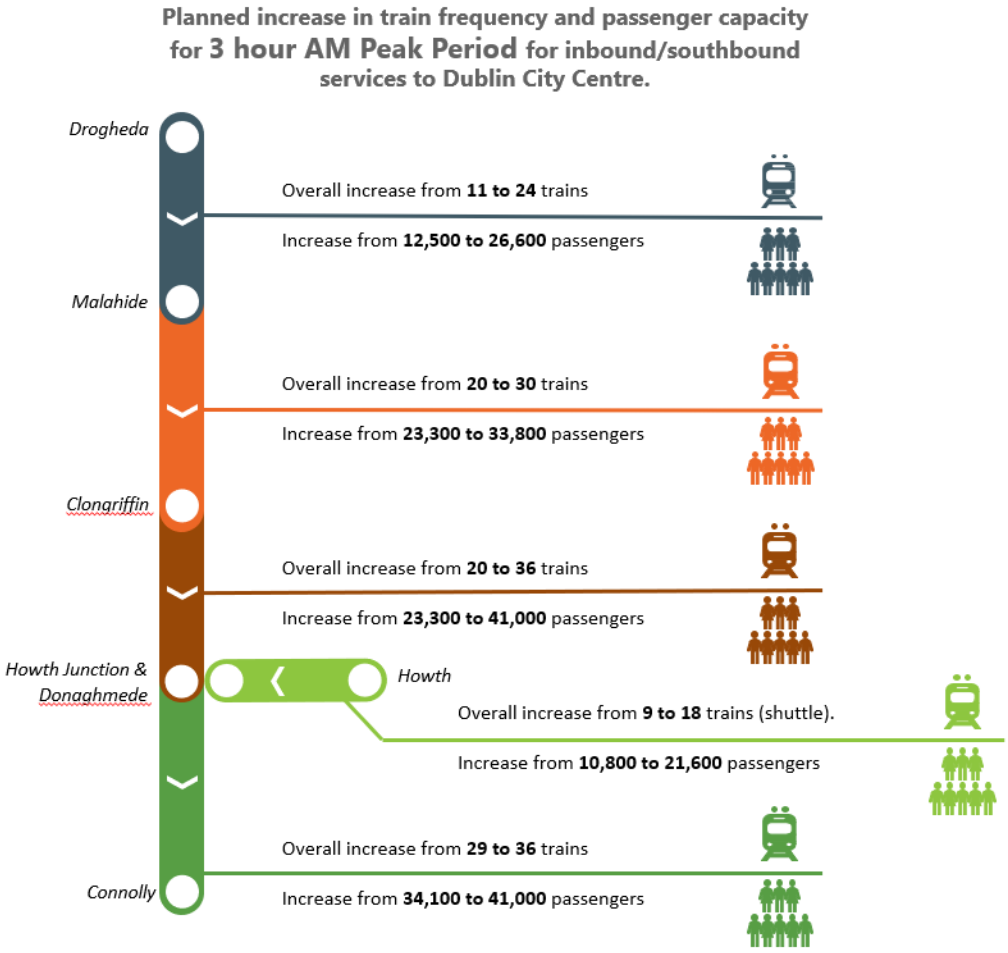

Figure 3-2 Services Capacity Increases during AM peak period

3.5 Proposed Works

The proposed project will predominantly follow the existing railway corridor with the addition of electrification. Interventions outside of Iarnród Éireann lands will be required at a number of locations for some of the scheme elements such as traction substations and construction compounds.

3.5.1 Key Infrastructure Elements of DART+ Coastal North

The key infrastructural elements of DART+ Coastal North include:

- Linear Works along the Northern Line to introduce electrification
    - Extension of existing 1500V DC electrification, which currently terminates at Malahide, as far as Drogheda MacBride Station (approximately 37km). This entails installation of foundations, masts and overhead wires as well as installation of new traction power substations to supply the required power and modified railway

boundary fences to protect the public from coming into contact with the overhead line. These works take place alongside the existing railway corridor, predominantly in Iarnród Éireann-owned land with the exception of the substations;

- Whilst the section of the Northern Line between Dublin City Centre and Malahide, inclusive of the Howth Branch, is already electrified, changes and upgrades to signalling equipment and associated power supply installations will be required in these areas to accommodate the proposed infrastructure works;
- Undertaking improvements / modifications to bridges spanning the railway arising from track reconfigurations and/or electrical clearances to achieve necessary vertical and horizontal clearances;
- Undertaking localised bridge modifications to enable over-head electricity lines (OHLE) to be fixed to bridges carrying the railway;
- Modifications to existing depots at Drogheda and Fairview to support the new train fleet, including the provision of additional train stabling at Drogheda;
- Drainage works, including surface water drainage and attenuation; and
- Any required landscaping in areas of intervention.

- Infrastructure works to facilitate increase in service frequency and capacity
  - These works will take place in specific areas of intervention as outlined below (from north to south).
    - Works around Drogheda MacBride Station;
    - Works to the existing user worked level crossing south of Donabate;
    - Works around Malahide Station;
    - Works around Clongriffin Station;
    - Works around Howth Junction & Donaghmede Station;
  - The works at existing stations entail modifications to existing tracks and platforms, as well as the addition of new tracks, where required, to stable and facilitate the turn back and through running of trains. These works are primarily located within existing railway land;
  - The works relating to closing the existing user worked level crossing south of Donabate, to deliver the increased level of train service and replace with appropriate relief infrastructure, if necessary.

3.5.2 Traction Power Substations

For the traction power supply to facilitate the Overhead Line Equipment (OHLE), construction of substations is required at various locations (some which are on land outside the railway corridor/ IÉ land boundary) as part of the works delivering an electrified railway between Malahide and Drogheda. Locations where new substations are required are:

- Donabate;
- Rush & Lusk;
- Skerries North;
- Skerries South;

- Balbriggan;
- Gormanston;
- Bettystown; and
- Drogheda.

The site selection process reflected the project requirements, including power requirements, flood risk, maintenance requirements for IÉ and ESBN staff (vehicular access required 24h) as well as environmental considerations. The exact proposed locations of these substations are not yet finalised, however each location will be assessed as part of the EIAR. The location and extents of the substations will be presented to the public at PC2 which is planned in Q2 2023. Appropriate engagement with the potentially affected landowners will take place in advance of PC2.

3.5.3 Construction Compounds

A number of construction compounds of varying sizes will be required along the length of the proposed project. These compounds are required for the storage of materials and for the erection of prefabricated sections required for construction. Some compounds will also be required for site offices and welfare facilities. The proposed locations of these compounds will be strategically selected to allow for access to the permanent way, the level crossings, at bridges requiring modifications, depots and stations and other locations for infrastructure or ongoing maintenance. Where permanent works are not located within the compound area, they will be reinstated following completion of the works and returned to the landowner. The location and extents of the construction compounds will be presented to the public at PC2 which is planned in Q2 2023. Appropriate engagement with the potentially affected landowners will take place in advance of PC2.

4. EIA PROCESS & RAILWAY ORDER

4.1 Introduction

This section describes the EIA process of identifying, evaluating and mitigating the effects (positive and negative) on the receiving environment as a result of a proposed project.

4.2 Requirement for EIA

The Transport (Railway Infrastructure) Act 2001 (No.55 of 2001) as amended, sets out the process required for making an application for a Railway Order. Section 37 (3) lists the required documentation when making an application, including a requirement for:

> *(e) a report on the likely effects on the environment (referred to subsequently in this Part as an 'environmental impact assessment report') of the proposed railway works'*

It is therefore mandatory to submit an EIAR with the Railway Order. The EIAR will be prepared in accordance to Directive (2014/52/EU) which was transposed into Irish law by the (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. no. 296 of 2018) and came into effect on 1 September 2018.

4.3 Relevant Policy, Plans and Guidelines

The EIA process will be undertaken in accordance with, but not limited to, the following legislation and guidance documents:

- Transport (Railway Infrastructure) Act 2001 (as amended);
- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations (as amended);
- Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment (as amended by Directive 2014/52/EC); and
- S.I. 296 of 2018 European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

This EIA Scoping Report has been prepared having regard to the following documents:

- Guidance on EIA Scoping (European Commission, 2017);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015);
- Environmental Impact Assessment Screening – Practice Note PN02 (OPR 2021); and
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

TII (formerly the National Roads Authority) has developed a series of best practice environmental guidelines to facilitate the integration of environmental issues into the planning of national road scheme.

The latest versions of the published guidelines will be consulted with during the preparation of this EIAR (http://www.tii.ie/tii-library/environment/) as appropriate to this rail project. Furthermore, each environmental factor has its own required methods of assessment, in accordance with published professional guidelines, details of which are provided within the section dealing with each environmental factor, in in this Report.

4.3.1 Environmental Impact Assessment (EIA) Process

An overview of the stages of the EIA Process for the proposed project is presented in Figure 4-1.

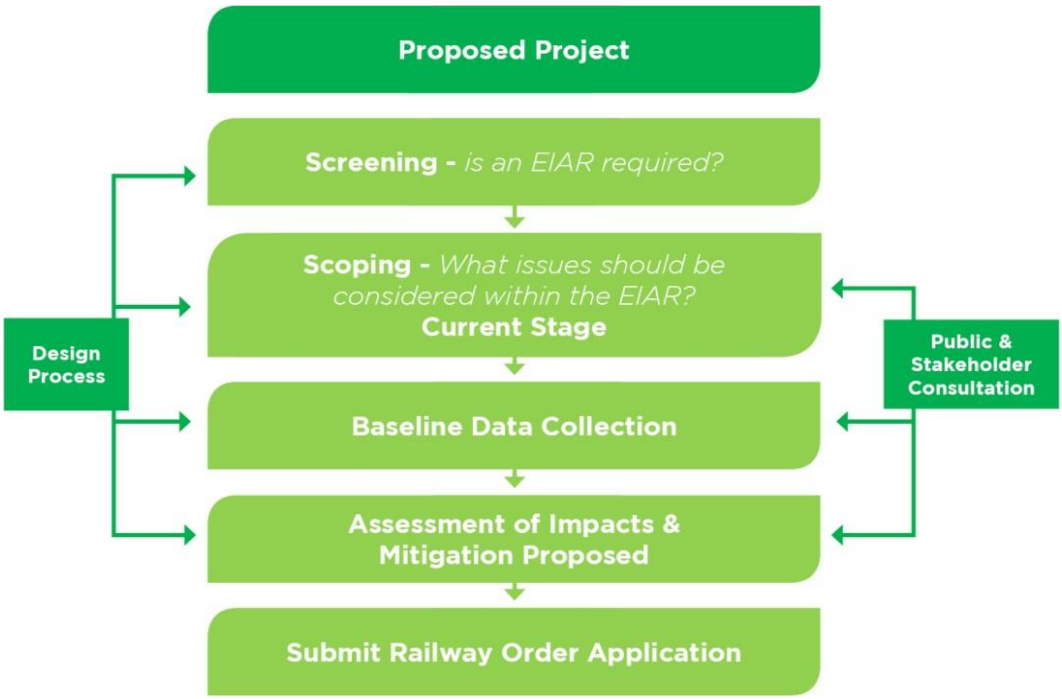

Figure 4-1 Overview of EIA Process

4.4 Alternatives

A description of the alternatives will be described and assessed in the EIAR as required by the EIA Directive 2011/92/EU (as amended by Directive 2014/52/EU) in accordance with Article 5.1 (d), Annex IV paragraph 2 and Annex IV.3. The Directive states that the EIAR should include:

> *'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.*

The alternatives assessment in the EIAR will describe and assess the reasonable alternatives considered for the proposed project. This can include alternatives such as: 'the do nothing' scenario, as well as alternative locations, alignments, processes or equipment and operating conditions.

The assessment of alternatives presented in the EIAR will be an informed by the Multi-Criteria Analysis (MCA) process presented in the Option Selection Report published as part of Public Consultation No.1 in February 2022.

The options assessment process is completed based on the Common Appraisal Framework (CAF) for Transport Projects and Programmes issued by the Department of Transport, Tourism and Sport in March (2016, updated Oct 2021) and assesses the options under the following criteria:

- Economy;
- Safety;
- Environment;
- Accessibility & Social Inclusion;
- Integration; and
- Physical Activity.

4.5 Railway Order Application

Railway works are governed by the Transport (Railway Infrastructure) Act 2001, (as amended by Part 4 of the Planning and Development (Strategic Infrastructure) Act 2006). This legislation is used to secure statutory approval for the construction of new railway or re-construction of any part of an existing railway (where significant alteration of the existing railway is proposed). A Railway Order will also confer powers to CIÉ to allow for the acquisition of private & public lands and rights to facilitate the construction and operation of the new railway. Railway Order Applications are made directly to An Bord Pleanála, as the statutorily appointed Competent Authority.

The proposed project will require the acquisition of a number of properties to facilitate the development and therefore a Compulsory Purchase Order (CPO) will be prepared which will identify all lands required for the construction and operation of the project. The CPO will identify the purpose of the lands to be acquired, the owners/reputed owners and / or lessees. All property owners will be engaged as early as possible in the process to attempt to minimise the impacts caused by the proposed project.

In summary, the Railway Order Application process includes:

- The powers to construct, operate and maintain the proposed railway works;
- The EIA and AA process; and
- The Compulsory Purchase Order (CPO) process.

All of the above processes will be progressed simultaneously as part of the Railway Order application process and will inform the environmental impact assessments, as appropriate.

4.5.1 Mitigation and Monitoring Measures

The EIAR will address potential environmental effects associated with the proposed project and will propose mitigation measures where significant effects are identified. The EIAR will also include a final chapter that will contain a schedule of environmental commitments that will bring together the mitigation measures detailed under each of the EIA environmental factors contained in the separate EIAR chapters. In addition to the proposed mitigation measures, monitoring measures where appropriate will be described in the EIAR.

4.6 EIAR Chapter Content

The methodology applied during the specific environmental assessments will be a systematic analysis of the proposed project in relation to the existing environment. The broad methodology framework for these assessments is outlined below and is designed to be clear, concise and will allow the reader to logically follow the assessment process through each environmental topic.

The report structure under each environmental topic/chapter will include:

- Introduction;
- Methodology;
- Existing environment;
- Potential impacts (During construction and operation);
- Mitigation measures;
- Residual impacts; and
- Cumulative impacts.

Although cumulative impacts will be addressed for each of the environmental topic, a separate chapter will be provided in the EIAR presenting a cumulative impact assessment of relevant approved plans and projects. For the purpose of this Scoping report only the methodology and potential impacts have been provided under each environmental topic.

4.7 Appropriate Assessment

The EU Habitats Directive (92/43/EEC) and EU Birds Directive (2009/147/EC) have been transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I.477/2011). Articles 6(3) and 6 (4) of the Habitat Directive requires that, any plan or project not directly connected within or necessary to the management of a European site (Special Areas of Conservation [SACs] and/or Special Protection Areas [SPAs]) but likely to have a significant effect thereon, either individually or in-combination with other plans or projects, shall be subject to Appropriate Assessment (AA).

An Appropriate Assessment (AA) Screening Report (Stage 1) will be prepared to assess in view of the best scientific knowledge, if the proposed project, either individually or in combination with other plans or projects, is likely to have a significant effect(s) on any European Site. If the effects are deemed to be significant, potentially significant, or uncertain then the process must proceed to Stage 2 AA with the preparation of a Natura Impact Statement (NIS). The AA Screening Report and, if required, the NIS, will accompany the Railway Order application. The Appropriate Assessment (AA) process will be undertaken concurrently with the EIA process, but both processes will be clearly distinguished.

4.8 Flood Risk Assessment

A Flood Risk Assessment (FRA) will be undertaken and will inform the assessment in the EIAR. All potential sources of flooding will need consideration including; river flooding, groundwater flooding, surface water runoff and flooding from sewers etc.

It should also assess the existing and proposed surface water drainage from the site. The Flood Risk Assessment will be a separate document, accompanying the Railway Order application.

4.9 Consultation

This section provides a description of the consultation process and describes the statutory and non-statutory consultation and engagement process. To assist in developing the EIAR consultation will serve the following key objectives:

- to establish a sufficiently robust environmental baseline of the proposed project and its surroundings;
- to identify, early in the process, specific concerns and issues relating to the proposed project so that they can be discussed and appropriately accounted for in the design and assessment;
- to ensure the appropriate involvement of the public and stakeholders in the assessment and design process; and
- to comply with the Aarhus Convention on Access to Information, Public Participation in Decision- Making and Access to Justice in environmental matters.

4.9.1 Pre-Application Consultations (PAC)

Pre-Application Consultations are being undertaken in accordance with Section 47B of the Transport (Railway Infrastructure) Act 2001 (as amended) by the Planning and Development (Strategic Infrastructure Act 2006 "Discussions with Board before making an application".

In accordance with Section 47B of the Act, *"the Board may give advice to the prospective applicant regarding the proposed application and, in particular, regarding –*

- *the procedures involved in making an application under this Part and in considering such an application, and*
- *what considerations, related to the proper planning and sustainable development or the environment, may, in the opinion of the Board, have a bearing on its decision to the application."*

A schedule of meetings has been agreed with ABP addressing the key scheme elements and EIA topics. To date two meetings have been held.

4.9.2 Prescribed Bodies & Key Stakeholders

All prescribed bodies were written to on 09th September 2021. This was an introductory letter advising all Consultees that the project had commenced, provided some background information on the DART+ Programme and provided contact details for further information.

Further to this all prescribed bodies will be provided with this EIA Scoping Report as part of the informal EIA Scoping process. Table 4-1 below provides a list of prescribed bodies as well as some of the other bodies contacted.

Table 4-1 List of Bodies Consulted to Date

Prescribed bodies under Article 211 of the Planning and Development (Strategic Infrastructure) Regulations	
Minister for Housing, Planning & Local Government	Minister for Tourism, Culture, Arts, Gaeltacht, Sport & Media c/o Development Applications Unit - National Parks Wildlife Service - National Monument Service - Architectural Heritage Advisory Unit
Minister for the Environment, Climate and Communications	Minister for Transport, Tourism and Sport
Other prescribed bodies under Article 213 of the Planning and Development (Strategic Infrastructure) Regulations	
Dublin City Council	Fingal County Council
Louth County Council	Meath County Council
Minister for Agriculture, Food and the Marine	Transport Infrastructure Ireland
An Chomhairle Ealaíon (The Arts Council)	An Taisce
Fáilte Ireland	Eastern and Midland Regional Assembly
The Heritage Council	Inland Fisheries Ireland
Waterways Ireland	Irish Aviation Authority
Córas Iompair Éireann	National Transport Authority
Minister for Justice, Equality and Law Reform	Health Service Executive
Commission for Regulation of Utilities (CRU)	Commission for Railway Regulation (Railway Safety Commission)
Irish Water	
Other key stakeholders	
Bat Conservation Ireland	Birdwatch Ireland
Minister Public Expenditure and Reform	Dublin Fire Brigade
Dublin Port	Geological Survey of Ireland
Health & Safety Authority	Irish Farmers Association
Irish Landscape Institute	Marine Institute
The Office of Public Works	Dublin Chamber of Commerce
Fingal Dublin Chamber	County Meath Chamber
Construction Industry Federation	IBEC
ESB Networks	EIRGrid
Gas Network Ireland	Bord Gais
Met Eireann	Irish Wildlife Trust
Minister for Business, Enterprise and Innovation	Eir Group
Minister for Enterprise, Trade and Employment	

4.9.3 Public Consultation

Public consultation is a useful tool in helping to identify local constraints which may be only locally known, and therefore not accounted for during previous parts of the process. This local knowledge gained through the public consultation process will be taken into consideration with regards to the emerging preferred solution, design considerations and environmental assessments.

IÉ considers non-statutory public consultation to be an essential part of the development of public infrastructure schemes and. IÉ endeavours to carry out a meaningful, transparent and accessible public consultation in compliance with the Aarhus Convention regarding public participation in decision making.

4.9.3.1 Public Consultation No. 1

Public Consultation on the Emerging Preferred Option commenced in February 2022 and ran for 8 weeks until 08 April 2022. The Emerging Preferred Option was presented based on the studies and consultations completed to date. The Preferred Option for all major scheme elements will be presented at Public Consultation No.2 in Q2 2023.

Due to the Covid-19 pandemic Public Consultation No.1 was a primarily digital consultation event in accordance with government restrictions. Some landowner meetings and a limited number of meetings with potentially affected residents were undertaken via video call or telephone.

The project website (https://www.dartplus.ie/en-ie/projects/dart-north) has been established and hosts all information relating to the project. A mail drop to c. 11,500 properties was undertaken to ensure that as many interested parties as possible were notified of the public consultation process during the opening week. Furthermore, a helpline was established to ensure that all calls received during the consultation period were answered, documented, passed to the dedicated Community Liaison Representative and responded to in a timely fashion where possible. Finally, a project email address was provided on all project material and a feedback form was provided on the project website to allow the public make submissions on the project.

4.9.3.2 Public Consultation No. 2

It is envisaged that Public Consultation No. 2 will proceed in Q2 2023.

The second non-statutory public consultation will present the Preferred Option.

The preferred option will be informed by the public and stakeholder feedback received at PC1 and by ongoing surveys and assessments. Public Consultation No. 2 will be taken forward when the option selection process is complete, and the optimised Preferred Option is fully defined. The Preferred Option represents the preferred solution which will be designed and further developed to allow it to be taken forward to Railway Order Application (for planning permission). The Preferred Option is also the intended proposed railway works that will be the subject of environmental examination in the context of the Environmental Impact Assessment.

This second round of non-statutory public consultations provides an opportunity for local residents, communities, rail users, road users and all other stakeholders & members of the public to engage at a stage in the design process where a full railway works scheme is presented and whilst public comments and feedback can be incorporated into the design process.

The second round of consultations is also a very useful timeframe for the public and stakeholders to inform the Environmental Impact Assessment process. It is hoped at this time that a hybrid including a physical roadshow type event can be held in combination with online consultation events subject to the government's current Covid-19 policy.

4.9.4 EIA Scoping Consultation

IÉ are now inviting submissions on the EIA Scoping Report and would like your views having regard to the following:

- Is the scope of the proposed assessment for the environmental assessments adequate?
- Are there any additional environmental issues or data sources that should be taken into consideration as part of the preparation of the EIAR?
- Are there any other environmental issues that should be considered as part of the preparation of the EIAR?

All relevant submissions on the proposed project are welcome.

A submission or observation in relation to the scope and/or level of detail of the information to be included in the EIAR may be in writing to IÉ within 6 weeks from the date of this scoping notice. Please send any submissions or observations marked '**DART+ Coastal North – EIA Scoping Consultation**' in writing to the address below:

Email: DARTCoastalNorth@irishrail.ie

Postal Address:

Community Liaison Officer,
DART+ Coastal North,
Iarnród Éireann,
Inchicore Works,
Inchicore Parade,
Dublin 8,
D08 K6Y3.

5. TRAFFIC & TRANSPORTATION

5.1 Introduction

This section describes the scope of work and methods to be applied in the identification and assessment of traffic and transportation effects associated with the proposed project. The proposed project is a major public transport project which will deliver many benefits to both the commuting public of Dublin and to the overall economic growth and sustainability of the Greater Dublin Area. As with all major projects of this nature, there is the potential for significant impacts in terms of traffic and the general movement of people and goods at all phases of development (including construction, operation and any decommissioning).

The objective of this section is to set out the data collection completed to inform the baseline situation, identifying the potential impacts of the proposed project on traffic and transport during construction and operational phases. On this basis the proposed methodology for measuring these impacts, identifying mitigation measures and, finally, identifying residual effects is outlined.

5.2 Legislation, Policy and Guidance

The following is not intended to be an exhaustive review of all policy that addresses the topic. It simply highlights where relevant policy and legislation has informed the scope or methodology of the impact assessment.

Table 5-1 Legislation, Policy & Guidance

Legislation, Policy and Guidance	How does the legislation shape the assessment
Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA, May 2022	The document outlines topics, relative to Roads & Traffic, that are typically addressed in an EIAR
Traffic & Transport Assessment Guidelines, TII, May 2014	The document outlines the principles / methodologies for assessing the traffic and transport impact of a new development, which will form the basis of the assessment to be undertaken for the EIAR
Project Ireland 2040 National Planning Framework, Government of Ireland, February 2018	The policies / proposals outlined in these documents will inform the future year transport infrastructure for the modelling process. Potential mitigation measures will also reflect the policies outlined in these documents.
Transport Strategy for the Greater Dublin Area 2016-2036, NTA, April 2016	
Fingal County Development Plan 2017-2023	
Dublin City Development Plan 2016-2022	
Meath County Council Development Plan 2021-2027	
Louth County Development Plan 2021-2027	
Design Manual for Urban Road and Streets (DMURS)	These documents outline principles and design standards for cyclist and pedestrian facilities and will be used when considering the potential impacts of the schemes on cyclists and pedestrians
NTA Permeability Best Practice Guide	
NTA National Cycle Manual	

5.3 Methodology

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

5.3.1 Study Area

The study area is illustrated in Figure 5-2.

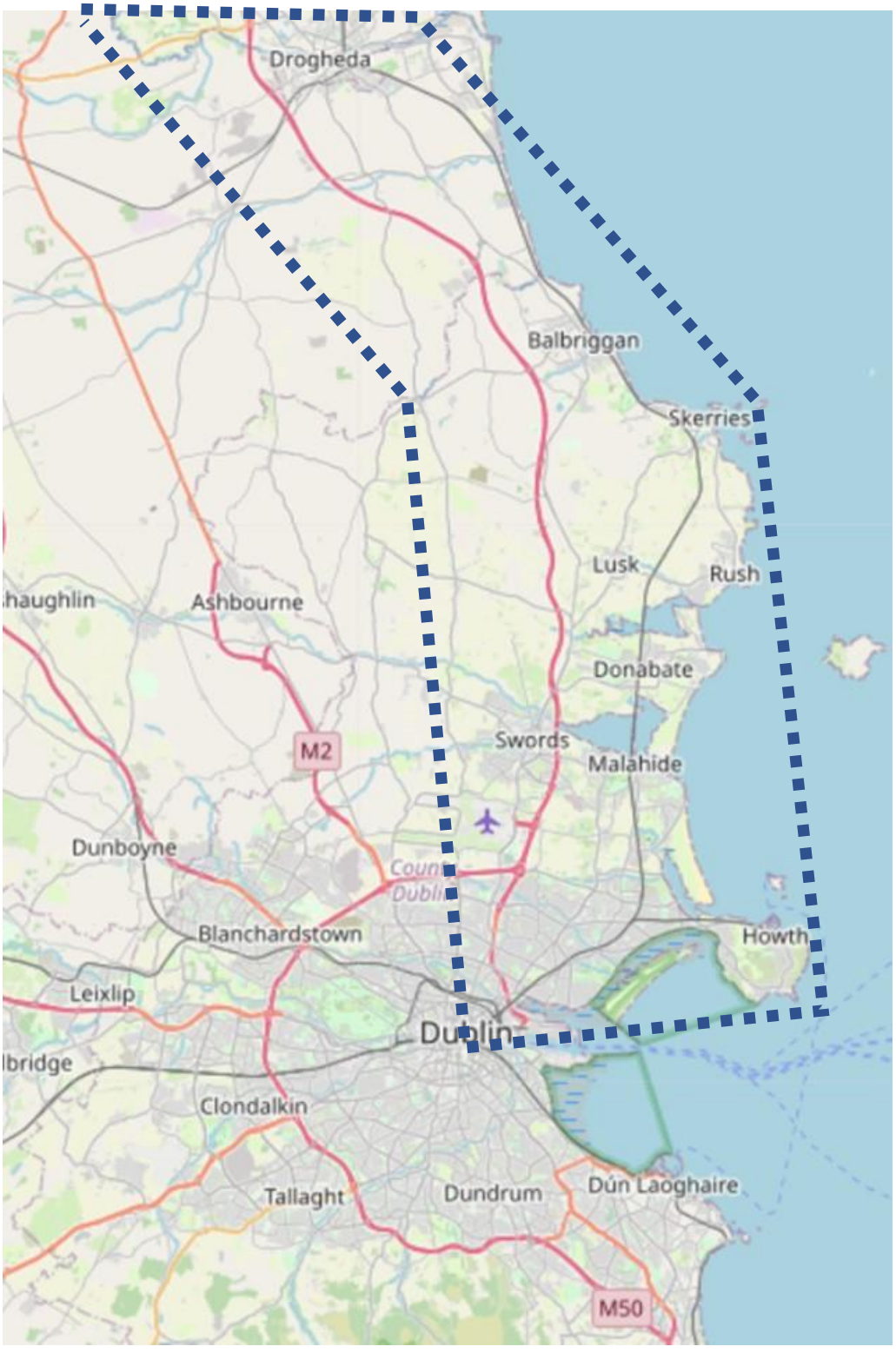

Figure 5-2 Proposed Study Area

5.3.2 Transport Modelling

The Business Case Model, derived from the NTA's Eastern Regional Model (ERM) will be applied. The model is calibrated for 2016 conditions. Traffic survey data will be collected, as outlined in Section 5.4. A forecast year model run will be carried out for 2022 and compared to the latest traffic survey data to ensure a robust assessment.

To be able to measure the impact of the proposed project, a 'Do Minimum' scenario is required with which to compare the 'Do Something' scenario, i.e. it is necessary to identify the changes to the base scenario that will occur regardless of the proposals for DART+ Coastal North. The 'Do Minimum' road network will contain any planned road improvements that will be in place by 2028 and 2043 as agreed at the time.

The Do Minimum model will then be amended appropriately to reflect the proposed 'Do Something' scenario. The road network will be updated to reflect the proposed amendments arising from the proposed changes to the level crossings, while the demand will be updated to reflect changes in mode share brought about by the proposed project.

An 'Opening Year +15' assessment will also be undertaken by increasing the background demand, in keeping with agreed national/regional future growth rates.

5.3.3 Methods of Assessment

The topics to be investigated and the criteria to be used in the assessment are set out in Table 5-2.

Table 5-2 Assessment Criteria

Category	Theme	Assessment Criteria
Road Traffic	Amended traffic flows due to potential changes in demand and changes to local road networks	Peak hour traffic flows & Link Capacities on selected local roads in the vicinity of the scheme
	Changes in traffic flows through local junctions due to potential changes in demand and changes to local road networks	Junction Capacities & queue lengths at selected local junctions (from SATURN initially, but LinSig can be used if more detailed junction modelling is deemed necessary)
	Changes to journey times due to potential changes in demand and changes to local road networks	Overall network journey times & Av. speeds
		Journey time analysis for select routes in the vicinity of the scheme
Public Transport	Change in Rail patronage due to improved service.	Derived from Business Case Model outputs
	Reduced waiting times for rail passengers due to improved service.	Comparison of Do Minimum vs Do Something timetables
Cyclists	Potential Comfort and safety issues due to changes in traffic flows on local road network.	Peak hour traffic flows on selected local roads in the vicinity of the scheme
		Changes to local junctions
	Change in journey time caused by changing barrier closure time of level crossings.	Using distance as a proxy for time, investigate end to end distance for select journeys in the vicinity of the scheme

Category	Theme	Assessment Criteria
Pedestrians	Potential Comfort and safety issues due to changes in traffic flows on local road network.	Peak hour traffic flows on selected local roads in the vicinity of the scheme
		Changes to local junctions
	Change in journey time caused by changing barrier closure time of level crossings.	Using distance as a proxy for time, investigate end to end distance for select journeys in the vicinity of the scheme
Other	Modal Shift	Mode share outputs from Business Case Model.

5.3.4 Significance

The proposed Design Manual for Roads and Bridges (DMRB) assessment methodology uses a five-point scale to assess impacts. Table 5-3 illustrates how this five-point scale maps onto the seven-point scale suggested in the EPA Guidance (EPA 2022).

Table 5-3 Significance of Effect

Significance of Impact (DMRB)	Significance of Impact (EPA)	Typical Effect Descriptor
Severe	Profound	Effects that the decision-maker must take into account as the receptor / resource is irretrievably compromised.
Major	Significant	Effects that may become key decision-making issues.
Moderate	Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on performance.
Minor	Slight	Effects that may be locally important.
Not Significant	Imperceptible	Effects that are within the ability of the receptor / resource to absorb change.

Based on Table 5-3, severe and major effects would be considered significant.

5.3.5 Surveys

Further studies are currently being undertaken by the design team in respect of modelling the existing railway and the proposed DART+ Programme network to develop the following:

- Baseline Train Service Specification and Working Timetable;
- Design Train Service Specification.

5.3.6 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the human health impact assessment and potential impacts at community level. No other specific consultation will be undertaken as part of this assessment at this stage.

5.4 Receiving Environment

An analysis of the receiving environment will be carried out as part of the EIAR. This will be carried out through analysis of existing desktop baseline traffic data, traffic surveys and modelled against predicted traffic numbers as a result of the proposed project. Further information can be found below.

5.4.1 Traffic Counts

Traffic surveys were undertaken at specific locations in Q2 2022 and includes the following:

- Automatic Traffic Counts (ATC) at 4 locations;
- Pedestrian and Cyclist counts at 8 locations;
- Junction Turning Counts (JTC) at 8 locations;
- Queue length surveys at 9 locations;
- Active boom gate surveys at 4 locations; and
- Journey time information NTA database.

The Automatic Traffic counts have been collected to obtain the following information over a 7 day period:

- The daily and weekly profile of traffic within the study area;
- Busiest time periods and locations of highest traffic demand on the network;
- Any issues on the network during the survey period e.g. accidents, road closures etc.; and
- Typical speed of traffic on the network.

5.5 Potential Impacts

5.5.1 Construction Impacts

The likely construction phase impacts are outlined in Table 5-4.

Table 5-4 Likely Construction Phase Impacts

Activity	Impact
Movement of materials to and from site	Increase in HGV movements in and around the local area.
Movement of construction workers to and from site	Increase traffic flows on the surrounding road network.
	Increased patronage on public transport services.
Changes to road layouts due to temporary traffic interventions, both internally and externally	Potential journey delay and congestion.
Disruption to existing rail services	Potential for reduced services, particularly on weekends
Loss of parking and disruption of access at stations	Disruption to existing commuting patterns

On the basis of the potential impacts presented above, a detailed assessment of construction impacts will be included in the EIAR.

Since the DART+ Coastal North works will be spread across multiple sites, each with its own construction programme, the potential impacts of each will need to be identified and quantified.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

5.5.2 Operational Impacts

The likely operational phase impacts are outlined in Table 5-5:

Table 5-5 Likely Operational Phase Impacts

Scheme Element	Impact
Improved frequency, and efficiency of train services	Modal Shift, leading to reduced traffic flows on the surrounding road network.
Changes in level crossing barrier closing times.	Increased frequency of stopping and reduced duration of stopping, leading to a potential re- distribution of local traffic.
	Changes to existing / proposed bus routes in the vicinity of the scheme.
	Changes to existing pedestrian facilities and journey times.
	Changes to existing cyclist facilities and journey times.

On the basis of the potential impacts presented above, a detailed assessment of operational impacts will be included in the EIAR.

6. POPULATION

6.1 Introduction

This section addresses the potential impacts on population relating to the construction and operational phases of the proposed project.

In accordance with the EPA Guidelines (2022), the relevant components of the population impact assessment will examine attributes and characteristics associated with:

- Land use and social considerations, including effects on community severance, amenity uses of the site or of other areas in the vicinity; and
- Economic activity, including tourism e.g. employment and population including associated land use.

This section outlines the relevant policy and guidance that will be consulted to carry out the population assessment as part of the EIAR. It also sets out the methodology, provides a high level description of the existing environment, and sets out the potential impacts on population during all phases of the proposed project.

6.2 Legislation, Policy and Guidance

The population assessment will require a comprehensive review of relevant policy frameworks, statutory and strategic plans including (but not limited to) the documents listed in Section 4 (relevant EIA legislation and guidance) as well as the planning policy documents set out in Section 2.3 of this report.

In addition, the following guidelines will be used for preparation of the population assessment for the EIAR:

- Guidelines on the treatment of Tourism in an Environmental Impact Assessment, Fáilte Ireland (2011); and
- Additionality Guide (Homes and Communities Agency (UK)) 2014).

6.3 Methodology

The population assessment will be undertaken in accordance with Directive 2011/92/EU (as amended). The methodology is devised based on established best practice with cognisance given to EPA Guidelines and other relevant guidelines. The population assessment will examine the attributes and characteristics associated with land use, social and economic considerations of the project to include:

Land use Change: The primary consideration relating to land use change is to assess whether the proposed project conforms with land use policy and to identify how the proposed project is likely to change the intensity of patterns, types of activities and land uses.

Journey Characteristics: Journey Characteristics relate to the journey length and the duration taken to make the journey.

The potential impacts of the proposed project on journey characteristics are connected to the potential impacts on journey amenity and community severance described below,

Journey Amenity and General Amenity: The potential impacts of the proposed project on journey amenity and general amenity on all road users will be assessed i.e. pedestrians, cyclists and vehicle drivers. The level of traffic on a road, the proximity and separation of footpaths and cycle-paths, the nature of any crossings/junctions to be negotiated, the legibility of a journey (including signage), visual intrusion (including sightlines) and safety for pedestrians, are amongst the factors relevant to the assessment of amenity, as are the number and types of people affected.

Severance: Severance is the effect to discourage community interaction and it occurs where access to community facilities or between neighbourhoods is impeded by a lengthening of journey time or by a physical barrier. However, relief from existing severance may also be provided by new development. The potential creation of severance or relief of severance from the proposed project will be assessed.

Economic Impacts: The potential economic impacts from the proposed project will be assessed. These impacts can occur at both the regional and local scale and can be either positive or negative. The proposed project may affect identifiable local business (which will be addressed in the Agricultural and Non-Agricultural assessments of the EIAR). Other economic impacts could affect the wider community, for example where a number of businesses are affected, tourism, or where the retail or business environment of a City/town is impacted.

Relevant environmental data will be considered from other environmental assessments in the EIAR including (but not limited to) traffic, noise, air and climate, water, soil, landscape and visual impacts, as appropriate.

Data sources to be consulted include:

- Census data including population and demographic data from Census 2016 and 2011 by the Central Statistics Office (CSO)[3];
- Pobal data; and
- Consideration of issues/ concerns raised during public consultations.

6.3.1 Study Area

There is no national guidance available on an appropriate study area to focus the population assessment. The study area has been defined with reference to the potential for impact from the proposed project using professional judgement and based on the availability of relevant information.

A detailed desk study and mapping exercise will be undertaken to collect data on land use and amenities in the area which will inform the population assessment. The desktop study will review and record the land use located within 300m either side of the proposed project and 500m at the existing stations, to inform the baseline assessment and to determine the location of potentially sensitive receptors, such as schools, hospitals, residential properties, tourism and recreational amenities.

[3] Census information for the 2022 census will be used if available when assessment is undertaken.

Population and demographic data will be informed by publicly available data such as Census to assess the impact of the proposed project on the population. The information on population will be acquired from Electoral Divisions (EDs) that are wholly or partially located within the study area. Should information on a specific aspect not be available at ED level, information relating to Dublin City and the counties of Fingal, Louth and Meath will be consulted. It is recognised that elements of the proposed transport project can influence activities across a distance larger than 300m and thus, a wider 'context' study area will also be included as appropriate in order to fully inform the assessment.

6.3.2 Surveys

Site surveys will be undertaken to verify the desktop land use information within the study area and to gain a greater understanding of the area and land use function.

6.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the population impact assessment and potential impacts at the community level.

6.4 Receiving Environment

An analysis of the receiving environment will be carried out as part of the EIAR.

6.5 Potential Impacts

6.5.1 Construction Impacts

Potential construction impacts on the population include:

- Temporary changes to land use characteristics affecting existing land uses;
- Temporary impacts on journey characteristics and journey amenity due to construction works/ traffic diversions, etc.;
- Temporary severance at community level; and
- Temporary disturbance and nuisance from construction activities on properties, local businesses and communities located in proximity to the proposed construction works.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

6.5.2 Operational Impacts

Potential operational impacts on the population include:

- The increased frequency in train services and reduced journey times will have a positive impact on rail passenger travel, accessibility to employment and will promote sustainable travel patterns and future development opportunities across a number of areas;
- The proposed project will contribute to the overall economic activity of the region by providing enhanced reliable transport network having a positive impact on economic activity;
- The proposed project will support tourism activity and recreation within the region; and

- There will be potential impacts due to changes in the transport network, journey amenities, severance, and access to public amenity/open space.

7. HUMAN HEALTH

7.1 Introduction

Health, is defined by the World Health Organization (WHO) as:

> "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*."

This section addresses the potential impacts on human health relating to all phases of the proposed project. Significant improvements between Dublin City Centre and Drogheda are proposed as part of the proposed project that will provide a high-capacity electrified public transport improvements. The proposed project includes the provision of infrastructure that will enable capacity enhancement and improved passenger experience at a number of existing train stations to allow for increased frequency of train services.

In accordance with the EPA Guidelines (EPA 2022), the relevant components of the human health impact assessment will examine attributes and characteristics associated with:

- Human health, considered with reference to and interactions with other environmental receptors contained in corresponding chapters such as air & climate, noise & vibration, traffic, water resources, electromagnetic effects, as appropriate.

This section outlines the relevant policy and guidance that will be consulted to carry out the human health assessment, it sets out the methodology, provides a high-level description of the receiving environment, and sets out the potential impacts on human health during all phases of the proposed project.

7.2 Legislation, Policy and Guidance

The human health assessment will be undertaken in accordance with Directive 2011/92/EU (as amended). The methodology is devised based on established best practice with cognisance given to EPA Guidelines (EPA 2022); see Section 4 of this report and other relevant environmental assessment guidelines.

The following guidelines will also inform the human health assessment for the EIAR:

- Health Impact Assessment Resource and Tool Compilation (US EPA 2016);
- Health Impact Assessment (Institute of Public Health Ireland 2009);
- Framework for Human Health Risk Assessment to Inform Decision Making (2014) developed by the United States Environmental Protection Agency (US EPA 2014); and
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

7.3 Methodology

To inform the human health impact assessment, a desktop study and literature review will be carried out to gather relevant health data and develop an in depth understanding of the health profile of the area. The literature review will inform potential health impacts arising from similar projects and will help inform potential health impacts on the population arising from the proposed project.

Additionally, relevant environmental data to human health will be considered from other environmental impact assessments in the EIAR including traffic, noise, air and climate, water, land and soil and landscape and visual impacts, electromagnetic interference as appropriate.

The human health assessment will be consistent with the EPA Guidelines (EPA 2022) where health is considered through the assessment of environmental pathways through which it could affect for example, water quality, air quality, noise, etc.

Identification of Vulnerable Groups: The population baseline characteristics or the community profile will be established to inform the impact assessment of the proposed project on human health thereby enabling the identification of potentially vulnerable groups in the study area. In general, children, adolescents and older people constitute a vulnerable group as they are likely to be more sensitive to changes in their environment.

Hazard Identification: Human health impacts related to transport infrastructure can arise as a result of a variety of factors and interactions across environmental receptors e.g. traffic accidents or safety issues, air and noise pollution, impacts on water quality, flooding, electromagnetic effects, etc. which have the potential to cause a threat to the health of populations and the wider environment.

Additionally, negative psychosocial hazards relating to the proposed project in the form of potential nuisance and anti-social behaviour will be assessed. The potential for positive psychosocial effects will also be assessed.

Electromagnetic Force (EMF) A separate assessment of the potential effects of EMF will be undertaken as part of the EIAR. This will have particular regard to the operational phase of the project. Other potential effects such as interference with equipment in sensitive locations such as hospitals, commercial activities will also be considered in that separate assessment.

Data sources to be consulted include:

- Health in Ireland – Key Trends 2019;
- Lenus Dublin City Health Profile 2015;
- Lenus Fingal Health Profile 2015;
- Lenus Louth Health Profile 2015;
- Lenus Meath Health Profile 2015;
- CSO Census 2016[4] data on Health, Disability and Carers;
- CSO Census 2016[5] data on an Age Profile of Ireland; and
- EPA Maps.

In addition to the data sources identified above, the following policy documents will also be consulted:

- Eastern and Midland Regional Spatial and Economic Strategy (RSES) 2019 – 2035;
- HSE Healthy Ireland Implementation Plan 2018 – 2022;
- Pobal and Institute of Public Health;
- Health Service Executive (HSE);

[4] Census information for the 2022 census will be used if available when assessment is undertaken.
[5] Census information for the 2022 census will be used if available when assessment is undertaken.

- Other relevant environmental data considered during the various environmental assessments,
- Consideration of issues/ concerns raised during public consultations; and
- Literature review related to transport bridges, rail projects and electrification of rail lines.

7.3.1 Study Area

There is no national guidance available on an appropriate study area to focus the human health assessment. The study area has been defined with reference to the potential for impact from the proposed project using professional judgement and based on the availability of relevant information.

The human health study area is related to the potential impacts of any emissions as a result of the proposed project. Generally, the closer to the works, the greater the potential for impacts. The most significant environmental impacts are likely to be confined within 50-100m of the proposed project. Some impacts such as noise, air quality and traffic may have a wider study area, and these are defined and considered as part of the respective specialist chapters as part of this EIAR that will inform those assessments. The construction phase (and decommissioning) impacts will also be assessed which will include compound locations, night works and haul routes for deliveries to site.

7.3.2 Surveys

The desktop land use surveys will inform the human health assessment by identifying potentially sensitive receptors, such as schools, hospitals, residential properties, tourism and recreational amenities. The surveys undertaken as part of other specialist assessments in the EIAR will be used to inform the human health assessment i.e. air and climate, noise and vibration, electromagnetic effects, and stray current.

7.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the human health impact assessment and potential impacts at community level. No other specific consultation will be undertaken as part of this assessment at this stage.

7.4 Receiving Environment

An analysis of the receiving environment will be carried out as part of the EIAR.

7.5 Potential Impacts

7.5.1 Construction Impacts

Human health impacts that will be considered during the construction phase of the EIAR will include:

- Potential impacts due to the proposed construction works as appropriate;
- Noise and vibration impacts (with reference to the separate noise and vibration assessments); and
- Air quality impacts (with reference to the separate air quality assessments.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

7.5.2 Operational Impacts

Human health impacts that will be considered during the operational phase of the EIAR will include:

- Likely improvements to rail passenger and road safety particularly due to the elimination of rail – road interaction;
- Potential impacts on the noise and vibration environment;
- Potential impacts on air quality environment and climate change due to change from diesel powered to electrified fleet; and
- Potential impacts due to electromagnetic force (with reference to the specific assessments contained in the EIAR).

8. BIODIVERSITY

8.1 Introduction

This section describes the legislation, guidance and methodologies that will be followed in completing the biodiversity impact assessment of the proposed project. It also provides a brief description of the receiving natural environment relevant to biodiversity and outlines the potential impacts that are likely to occur during the construction and operation of the proposed project.

8.2 Legislation, Policy and Guidance

The following legislation, policy and guidance documents will be taken into account during the biodiversity assessment:

Policies / Plans

- The Habitats Directive (92/43/EEC);
- The Birds Directive (2009/147/EC);
- The Water Framework Directive (2000/60/EC);
- The EIA Directive (2014/52/EU);
- Environmental Liabilities Directive (2004/35/EC);
- European Communities (Birds and Natural Habitats) Regulations, 2011;
- The Wildlife Act 1976, as amended;
- The Flora (Protection) Order, 2015;
- Inland Fisheries Acts 1959 – 2010, as amended;
- National Biodiversity Action Plan 2017 – 2021 (Department of Culture Heritage and the Gaeltacht, 2017);
- Biodiversity – Climate Change Sectoral Adaptation Plan (Department of Culture Heritage and the Gaeltacht, 2019);
- All-Ireland Pollinator Plan 2015 – 2021 (NBDC, 2015);
- County Meath Biodiversity Action Plan 2015 – 2020 (MCC, 2015);
- Local Biodiversity Action Plan for Louth 2021-2026 (LCC 2021);
- Dublin City Biodiversity Action Plan 2015 – 2020 (DCC, 2015);
- Biodiversity Action Plan for Dublin City 2015 – 2020 (DCC, 2015);
- Dublin City Invasive Alien Species Action Plan 2016 – 2020 (DCC, 2016);
- Fingal Biodiversity Action Plan 2018 – 2023 (FCC, 2018); and
- Irish Rail Corporate and Social Responsibility Statement 2016.

Guidance Documents

- CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester;
- Collins, J. (Ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London;

- EC (2000) Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC. Environment Directorate-General of the European Commission;
- EC (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment;
- EC (2018) Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission, Brussels;
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements;
- EPA (2015) Draft Advice Notes for preparing Environmental Impact Statements;
- EPA (2022) Guidelines on information to be contained in the Environmental Impact Assessment Report;
- Fossitt, J. (2000). Guide to Habitats in Ireland. The Heritage Council;
- Kelleher, C. and Marnell, F. (2006). Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No 25. National Parks & Wildlife Service, Dublin, Ireland;
- TII (2006a) Guidelines for the Treatment of Bats during the Construction of National Road Schemes;
- TII (2006b) Environmental Assessment and Construction Guidelines National Roads Authority, Dublin;
- TII (2006c) Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes;
- TII (2006d) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes;
- TII (2008a) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes;
- TII (2008b) Guidelines for the Treatment of Otter Prior to the Construction of National Road Schemes;
- TII (2008b) Guidelines for Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;
- TII (2009a) Environmental Impact Assessment of National Road Schemes – A Practical Guide;
- TII (2009b) Guidelines for Assessment of Ecological Impacts of National Road Schemes; and
- TII (2010) Guidelines on Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads.

8.3 Methodology

The following paragraphs describe the methodology that will be used in collecting information, describing the baseline ecological conditions and in assessing the likely impacts of the proposed project on biodiversity.

In accordance with Transport Infrastructure Ireland (TII) Guidelines for Assessment of Ecological Impacts of National Road Schemes (TII 2009b) an impact assessment will be undertaken of Key Ecological Receptors within the Zone of Influence of the proposed project.

According to these guidelines, the Zone of Influence is the "effect area" over which change resulting from the proposed project is likely to occur and the Key Ecological Receptors are defined as features of sufficient value as to be material in the decision-making process for which potential impacts are likely.

On completion of scoping, a desk study will be undertaken and will include a thorough review of the available ecological baseline data within the study area. The baseline information obtained from the desk study will be used to define the Zone of Influence of the proposed project. The following resources will be used:

- National Parks & Wildlife Service (NPWS) map viewer will be reviewed to determine the location of national (e.g. Natural Heritage Areas) and European (e.g. Natura 2000 sites) designated sites within the Zone of Influence of the proposed project;
- National Biodiversity Data Centre (NBDC) map viewer will provide protected species data;
- Irish Wetland Bird Survey Site Inventory (I-WeBS);
- Birds of Conservation Concern (BoCCI) in Ireland 2014-2019 (Colhoun & Cummins, 2013); and
- Environmental Protection Agency (EPA) Unified GIS Application will provide data in relation to the Water Framework Directive Risk/Status of waterbodies and watercourses in the Zone of Influence.

Following the desk study, field surveys will be conducted over the full area of the proposed project adhering to the following guidelines:

- Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (TII, 2008b);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (TII, 2009); and
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).

The process of identifying, quantifying and evaluating potential impacts of the proposed project on habitats, species and ecosystems will be undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) best practice guidance (CIEEM, 2019).

Where potential significant negative effects are identified, detailed and specific mitigation measures will be proposed in accordance with the hierarchy of options suggested in European Commission report, '*Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC'*. These mitigation measures will be incorporated into the design of the proposed project.

8.3.1 Study Area

The extent of the study area is defined by the ecological features likely to occur within an effects distance from the proposed project. This is informed by the findings of the desk study (presence/absence of protected habitats, flora or fauna within the Zone of Influence) and best practice methodology referenced above for assessing impacts on those ecological features. The study area in this case will include a 50m buffer around the proposed project boundary, where accessible, and also includes species specific survey buffer zones (e.g. derogation limits for Otter where accessible and safe to do so).

8.3.2 Surveys

Ecological surveys will be carried out to establish the baseline ecological conditions within the project footprint including an appropriate buffer. Habitats will be classified according to *A Guide to Habitats in Ireland* (Fossitt, 2000). Surveys for species groups including but not limited to plants, mammals (badger, otter, bats), amphibians and reptiles, invasive species and birds will also be undertaken to inform the impact assessment.

8.3.3 Consultation

A wide range of consultees will be engaged with during the scoping process and wider stakeholder consultation (including public consultation) will be undertaken. In addition to this, specific consultation in respect of the biodiversity assessment will be undertaken as appropriate with the following bodies:

Statutory

- National Parks and Wildlife Service;
- Inland Fisheries Ireland; and
- Waterways Ireland.

Non-Statutory

- Birdwatch Ireland;
- Irish Brent Goose Research Group;
- Bat Conservation Ireland;
- Irish Wildlife Trust; and
- Botanical Society of Britain & Ireland (BSBI).

8.4 Receiving Environment

8.4.1 European Sites

There are a number of European sites traversed by the DART+ Coastal North project, or is in close proximity to, or hydrologically linked. These include:

- South Dublin Bay and River Tolka Estuary SPA [004024]. The DART+ Coastal North works are within c. 300m of this European site;
- North Dublin Bay SAC [000206]. The DART+ Coastal North works are within c. 900m of this European site;
- North Bull Island SPA [004006]. The DART+ Coastal North works are within c. 900m of this European site;
- Baldoyle Bay SAC [000199]. The DART+ Coastal North works are within c. 450m of this European site;
- Baldoyle Bay SPA [004016]. The DART+ Coastal North works are within c. 550m of this European site;
- Malahide Estuary SAC [000205]. The DART+ Coastal North works traverse this European site;

- Malahide Estuary SPA [004025]. The DART+ Coastal North works traverse this European site;
- Rogerstown Estuary SAC [000208]. The DART+ Coastal North works traverse this European site;
- Rogerstown Estuary SPA [004015]. The DART+ Coastal North works traverse this European site;
- River Nanny Estuary and Shore SPA [004158]. The DART+ Coastal North works are within 10m of this European site;
- River Boyne And River Blackwater SAC [002299]. The DART+ Coastal North works are within c. 10m of this European site;
- Boyne Coast and Estuary SAC [001957]. The DART+ Coastal North works are located c. 2km from this European site and is hydrologically linked via the River Boyne; and
- Boyne Estuary SPA [004080]. The DART+ Coastal North works are located c. 1km from this European site and is hydrologically linked via the River Boyne.

8.4.2 National Sites

There are no NHAs traversed by or in proximity to the DART+ Coastal North project. There are a number of pNHAs traversed by the project or that are located in close proximity to. This includes:

- Royal Canal pNHA [002103]. The ecological value of the canal lies in the diversity of species along its linear habitats, many of which are further protected under European and National Legislation. The DART+ Coastal North project boundary traverses this National site;
- North Dublin Bay pNHA [000206]. See SAC/SPA above;
- Baldoyle Bay pNHA [000199]. See SAC/SPA above;
- Sluice River Marsh [pNHA]. The DART+ Coastal North project boundary runs directly adjacent to this National site in Pormarnock;
- Malahide Estuary pNHA [000205]. See SAC/SPA above;
- Rogerstown Estuary pNHA [000208]. See SAC/SPA above;
- Laytown Dunes/Nanny Estuary pNHA [000554]. The DART+ Coastal North project boundary traverses this National site; and
- Boyne Coast and Estuary pNHA [001957]. See SAC/SPA above.

8.5 Potential Impacts

8.5.1 Construction Impacts

- Disturbance of wildlife;
- Habitat Loss, Fragmentation and Degradation (Noise, Lighting, Vibration, Visual);
- Loss of resting places of protected species;
- Ground water pollution;
- Alteration of groundwater flow patterns;
- Surface water pollution;
- Impacts on designated sites; and
- Spread of Invasive Alien Species (IAS).

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

8.5.2 Operational Impacts

Some potential operational impacts include:

- Direct Mortality (Trains, Cars and Powerlines; collision and barotrauma);
- Electro Magnetic Fields;
- Habitat disturbance (Noise, Lighting, Vibration, Visual);
- Ground water pollution;
- Alteration of groundwater flow patterns;
- Surface water pollution;
- Impacts on designated sites;
- Loss and/or degradation of habitat (trimming or removal of hedgerows, trees, grassland); and
- Fragmentation of commuting/foraging corridors.

9. LAND AND SOILS

9.1 Introduction

This section outlines the relevant policy and guidance that will be consulted to carry out the Land and Soils assessment as part of the EIAR, it sets out the methodology, provides a high level description of the receiving environment, and sets out the potential impacts on land and soils and for managing geotechnical risk for the construction and operational phases of the proposed project.

9.2 Legislation, Policy and Guidance

The main documents that will be followed, in the preparation of the land and soils assessment are as follows:

- IGI Guidelines "Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements" (IGI 2013); and
- National Roads Authority (NRA) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (hereafter referred to as the NRA Guidelines) (NRA 2008a).

Though the NRA is now known as Transport Infrastructure Ireland (TII), for the purpose of this scoping report, the guidelines mentioned above are referred to as the NRA Guidelines.

The NRA Guidelines outlines the legislative context for linear projects. Government bodies aid national and local policy development and provide consultation on various issues. Under the guise of land and soils, there are several topics presented in Table 9-1 which lists the relevant bodies and acts of legislation. These are grouped under sub-headings and will be assessed to understand the potential influences, impacts and interactions of the project, for Land Quality, Designated Features, Quarrying and Economic Resources and Geological Heritage.

Table 9-1 Legislation and Government Bodies

Legislation	Government Bodies
Land Quality Protection of the Environment Act, 2003 Environmental Impact Assessment Directive (2011/92/EU) S.I. No. 547 of 2008 European Communities (Environmental Liability) Regulations Environmental Liability Directive (2004/35/EC) Planning and Development Act, 2000 Planning and Development Regulations, 2001 Planning and Development (Amendment) Act 2010	Department of Communications, Climate Action and Environment Department of Agriculture, Food and the Marine Local Authorities Environmental Protection Agency Teagasc

Legislation	Government Bodies
Designated Features Waste Framework Directive (2008/98/EC) Water Framework Directive (2000/60/EC) Groundwater Directive (2006/118/EC) S.I. No. 9 of 2010 European Communities Environmental Objectives (Groundwater) Regulations 2010 and amendments (S.I. 389 of 2011 and S.I. 149 of 2012) Urban Wastewater Directive (97/271/EEC) Flooding Directive (2007/60/EC) S.I. No. 122 of 2010 European Communities (Assessment and Management of Flood Risks) Regulations 2010 Habitats Directive (1992/43/EEC)	Department of Communications, Climate Action and Environment Local Authorities Office of Public Works National Parks & Wildlife Service Inland Fisheries
Quarrying & Economic Resources Minerals Development Acts, 1940-1999 Mines and Quarries Act, 1965 Planning and Development Act, 2000 Planning and Development Regulations, 2001	Department of Communications, Climate Action and Environment Local Authorities Environmental Protection Agency

A complete listing of the legislation recorded in various relevant sources is contained in Appendix A of the Institute of Geologists of Ireland publication, "*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*" (Geologists of Ireland 2013).

9.3 Methodology

Once the baseline environment has been defined, the potential impacts of the proposed project on land and soils will be assessed by classifying the importance of the relevant attributes and quantifying the likely magnitude of any impact on these attributes.

9.3.1 Study Area

The study area will be defined consistent with the needs of the proposed project. A buffer of 250m is adequate in most places for the consideration of indirect impacts but a wider review will be made as some features of importance may be present within a wider area e.g. within the wider 2km there may be a groundwater dependant habitat or quarry, etc.

9.3.2 Surveys

A desk study review of the baseline environment has been undertaken to assess the ground conditions present, including a review of publicly available datasets including geological mapping of the soils, subsoils and bedrock, historical ground investigations and historical mapping. A number of project walkover surveys have been undertaken to date.

Surveys to be progressed include intrusive ground investigations and non-intrusive geophysical surveys. The objectives of these surveys are to obtain geotechnical, geological, geoenvironmental and hydrogeological information on the ground conditions present. This information will be used to inform the design of the proposed project and the management of geotechnical risk.

Understanding the expected ground conditions along the proposed route through ground investigations and further assessment will be necessary to mitigate against design or construction risks as well as potential impacts on existing earthworks or structures and interactions with sensitive receptors and designated sites.

9.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the land and soils impact assessment and potential impacts. Specifically related to potential impacts on the soils and geology environment, the following organisations will be consulted:

- Geological Survey Ireland;
- Planning departments of the relevant local authorities;
- Waterways Ireland; and
- An Taisce.

9.4 Receiving Environment

The landcover for the study area includes artificial, recreational and urban fabric in urban and developed areas and along the railway corridor with agricultural areas in between. While there is limited historic ground investigation information along the proposed project corridor, it is anticipated that the overburden stratigraphy is comprised of up to 5m depth of made ground in urban areas.

The subsoils along the proposed project are comprised of recent fine and coarse grained alluvial, peatland estuarine and marine sediments associated with the rivers, estuaries and marine locations. These overlie or are adjacent to Quaternary glacial deposits derived from the underlying bedrock with widespread glacial tills including Irish Sea till adjacent to the coast.

The underlying bedrock is variable and dominated by Carboniferous limestones and calcareous shales with older Silurian deep marine sediments (mudstones, greywacke and conglomerates) indicated along the route from Skerries to Laytown and volcanic Ordovician basalt (andesite, tuff, slate & mudstone) expected in the area around Balbriggan.

9.4.1 Soil stability

The GSI landslide susceptibility mapping has classified the area as being of low susceptibility to landslides. However, there is a potential for soft and unstable soils associated with waterbodies and the estuary crossings at Malahide and Rogerstown.

9.4.2 Geological Heritage Areas

Table 9-2 indicates the Geological Heritage Areas along the proposed project.

Table 9-2 Geological Heritage Areas

GHA	Site Code	Designation	Description	Geological	Distance from railway (m)
Laytown to Gormanston	MH008	CGS	Coastal plain, including sea cliffs	Flat to gently undulating glacial outwash plain of sandur gravels	0
Milverton Quarry	D015	CGS*	Working Quarry	Exposed faces of Lower Carboniferous limestone and shale displaying karst weathering features (pipes and caves)	115
Fancourt Shore	DF002	CGS*	Coastal cliffs and foreshore	Coastal exposures of near complete Silurian succession (slates, sandstones and volcanics) dated by its graptolite fossils	150
Ardgillan House Boulder	DF008	CGS	Single large boulder on access path to Ardgillan house	A boulder composed of Ordovician pillow lavas, displaying concentric cooling structures	435
Malahide Point	DF020	CGS*	Dunes and a sand/shingle beach	A large dune system and beach formed by a long sand and shingle spit	500
Curkeen Hill Quarry	DF004	CGS*	Disused quarry used as landfill site	Exposed face of Lower Carboniferous mudbank limestone composed largely of diverse shelly fauna	585
North Bull Island	DC007	CGS	This site comprises sand flats and associated beach, dune, lagoon and slack features	The island hastself is a very recent result of human intervention in the bay in the last 200 years	1600

*recommended for Geological NHA

9.4.3 Contaminated Land and Existing quarries and pits

Potential sources of contamination within the study area have been investigated and identified ranging from historic heavy industries, such as gas works and linen factories in urban areas, to a number of historical quarries, pits and brickworks on and along the proposed route. There are numerous light industries within the study area which are not considered to be a significant constraint for soils and geology. The railway itself poses a potential source for contaminated land.

Landfills of interest in proximity to the proposed project area include the remediated Balleally Landfill (now Rogerstown Park and Milverton Waste Recovery Facility) to the south of Skerries Station.

9.4.4 Economic Geology

The nearest active quarries in the area are Feltrim Quarry in Swords and Greenhills Pit in Gormanston.

The crushed rock aggregate potential for the project area ranges from Very Low to Low for the majority of the area with increasing potential to the north and pockets of high potential around Skerries and Malahide. The granular aggregate potential in the area is limited to superficial deposits associated with waterbodies, estuaries, marine sediments and old glacial valleys and is quite variable. There are several licences held for prospecting within the study area, but these are generally reporting uneconomically extractable mineral resources.

9.5 Potential Impacts

9.5.1 Construction Impacts

During the construction phase there is potential for an impact on the land, soils and geology from the following:

- Loss or damage of topsoil;
- Excavation of soils, subsoils and bedrock (generation of earthworks material, ideally for direct reuse within the proposed project);
- Excavation of soft ground or contaminated land (potentially unsuitable for direct reuse within the proposed project);
- Interactions with existing earthworks or structures and interactions with sensitive receptors and designated sites.
- Loss of future quarry or pit reserve; and
- Loss or damage of proportion of Geological Heritage Area.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

9.5.2 Operational Impacts

The Operational Phase has the potential to lead to occasional accidental leakage of oil, petrol or diesel, allowing contamination of the surrounding environment. Potential positive impacts during the operational phase include the removal of legacy contamination if found present within the proposed project.

10. WATER (INCLUDING HYDROLOGY AND FLOOD RISK)

10.1 Introduction

This section outlines the relevant policy and guidance that will be consulted to carry out the water assessment as part of the EIAR. It also sets out the proposed methodology for the assessment, provides a high level description of the receiving environment, and sets out the potential impacts on hydrology during the construction and operational phases of the proposed project.

10.2 Legislation, Policy and Guidance

The assessment of water will be conducted with consideration of relevant legislation and guidance including:

- European Communities (Drinking Water) Regulations 2000 (S.I. No. 439 of 2000);
- Urban Waste Water Treatment Regulations 2001 (S.I. No 254 of 2001);
- European Communities (Quality of Surface Water Intended for the abstraction of Drinking Water) Regulations 1989. (S.I. No. 294 of 1989);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA 2003);
- Draft EPA Advice Notes for Preparing Environmental Impact Statements, September 2015 (EPA 2015);
- NRA 2008 Guidelines for the crossing of watercourses during the construction of National Road Schemes (NRA 2008);
- NRA 2009 Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2009); and
- OPW and DoEHLG 2009, 'Guidelines for Planning Authorities: The Planning System and Flood Risk Management' (OPW and DoEHLG 2009).

10.3 Methodology

The water impact assessment methodology will be undertaken as per Section 5.6 of the TII / NRA Guidelines pertaining to the treatment of water (NRA 2009). The Impact category, duration and nature of impact will be taken into account in the assessment as per the guidelines. The criteria for assessing the importance of hydrological features within the study area and the criteria for quantifying the magnitude of impacts follow the TII / NRA guidelines.

The assessment will consist of a desk study of available published information with additional survey and sampling information to be procured if required. The methodology considers the existing environment and the assessment of the potential impacts of the proposed project. It will include an assessment of published literature available from various sources including a web-based search for relevant material. Site specific topographical information and aerial photography will be reviewed to locate any potential features of hydrological interest and investigated on the ground by walkover surveys in order to assess the significance of any likely environmental impacts on them.

Available topographical and hydrometric information (field and desk based) will be used to perform water impact assessments of all watercourse crossings and proposed outfall locations. All watercourses and water bodies which could be affected directly (i.e. crossed or realigned/ diverted) or indirectly (i.e. generally lie within 250m of the road development boundary or would receive storm runoff from the proposed project) will be assessed through a series of initial walkover visits followed up by a more detailed survey and hydrological assessment. Due to the nature of the water environment it is necessary to consider the larger river catchment environments that the proposed project traverses.

The following list of data sources will be reviewed as part of this assessment of the impacts on water:

Ordnance Survey Ireland (oSi)

- Discovery Series Mapping (1:50,000);
- Six Inch Raster Maps (1:10,560);
- Six inch and 25inch OS Vector mapping; and
- Orthographic Aerial Mapping.

Environmental Protection Agency (EPA)

- Teagasc Subsoil Classification Mapping;
- Designated protection areas;
- Water Quality Monitoring Database and Reports;
- Water Framework Directive Status and Risk Classification; and
- EPA Hydrometric Data System.

Office of Public Works (OPW)

- Arterial Drainage scheme land benefitting Mapping for Ireland;
- OPW and Drainage District arterial Drainage Channels and maintained channels;
- OPW hydrometric Data website;
- Floodmaps Site (floodinfo.ie);
- OPW FSU (Flood Studies Update) Web Portal Site for Flood flow Estimation; and
- OPW Preliminary Flood Risk Assessment Mapping (pFRA).

Local Authority Information (Dublin City, Fingal, Louth, Meath)

- County Development Plans including Strategic Flood Risk Assessments;
- Planning Register; and
- Water Services – Abstractions, Discharges & Supply Schemes.

National Parks and Wildlife Service (NPWS)

- Designated Areas Mapping; and
- Site Synopsis Reports.

Other sources

- Aerial survey photography; and

- Geological Survey of Ireland (GSI) Web Mapping.

10.3.1 Study Area

This proposed project covers a considerable geographical distance, traversing multiple discrete catchments. The proposed study area for the assessment will as a minimum extend to 250m from the proposed projects landtake boundary (as per NRA 2009 Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes). All watercourses and water bodies which could be affected directly (i.e. crossed or realigned/ diverted) or indirectly (i.e. generally lie within 250m of the development boundary or would receive storm runoff from the proposed project) will be assessed.

10.3.2 Surveys

Field surveys and walkover assessments will be carried out to assess the hydrological impacts of the proposed project. Detailed watercourse surveys (including topographical surveys where required) will be undertaken at areas where water impacts were likely to occur without appropriate mitigation, specifically bridge crossing locations, proposed outfall locations and ecologically sensitive areas. Flow estimation in selected outfall streams may also be required.

Water quality sampling data for the receiving waterbodies will be collected from existing sources (EPA, local Authorities) to inform the baseline assessment. A gap analysis will be undertaken to determine if additional sampling data is required at specific locations (e.g. proposed drainage outfall locations). Where additional sampling is required, this will be undertaken for a sufficient duration preceding any proposed works being undertaken.

10.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the hydrology impact assessment. Specifically related to potential impacts on the water environment, the following organisations will be consulted:

- Environmental Protection Agency;
- Local Authority Waters and Communities Office (LAWCO);
- National Parks and Wildlife Service;
- Irish Water;
- Office of Public Works (OPW);
- Louth County Council;
- Meath County Council.
- Fingal County Council; and
- Dublin City Council.

10.4 Receiving Environment

10.4.1 Surface Water Bodies

The DART+ Coastal North route extends through 16 river sub-basins. The river sub-basins and their status from Dublin city centre to Drogheda are summarised in Table 10-1.

Table 10-1 River sub-basin

River sub-basin	WFD code	River Waterbody WFD Status 2013-2018	WFD Risk
Liffey_190	IE_EA_09L012360	Moderate (high confidence)	At Risk
Tolka_060	IE_EA_09T011150	Moderate (low confidence)	At Risk
Santry_020	IE_EA_09S011100	Moderate (low confidence)	At Risk
Mayne_010	IE_EA_09M030500	Poor (high confidence)	At Risk
Sluice_010	IE_EA_09S071100	Poor (low confidence)	Review
Gaybrook_010	IE_EA_08G080700	Poor (low confidence)	Review
Turvey_010	E_EA_08T020700	Poor (low confidence)	At Risk
Ballyboghil_010	IE_EA_08B012200	Poor (high confidence)	At Risk
Palmerstown_010	IE_EA_08P030930	Poor (low confidence)	Review
Balcunnin_010	IE_EA_08B310940	Moderate (low confidence)	Review
Mill Stream (Skerries)_010	IE_EA_08M030500	Poor (low confidence)	At Risk
Matt_010	IE_EA_08M010900	Poor (low confidence)	At Risk
Delvin_040	IE_EA_08D010400	Poor (medium confidence)	At Risk
Mosney_010	IE_EA_08M020100	Poor (medium confidence)	At Risk
Nanny (Meath)_050	IE_EA_08N010700	Poor (medium confidence)	At Risk
Betaghstown_010	IE_EA_08B330980	Unassigned	Review
Stagrennan_010	IE_EA_07S320550	Moderate (low confidence)	Review

Downstream of the river sub-basins there are eight transitional and five coastal waterbodies. A summary of the transitional and coastal waterbodies is provided in Table 10-2.

Table 10-2 Transitional and coastal waterbodies

Waterbody type	Waterbody	WFD code	River Waterbody WFD Status 2013-2018	WFD Risk
Transitional	Liffey Estuary Lower	IE_EA_090_0300	Good	At Risk
Transitional	Tolka Estuary	IE_EA_090_0200	Moderate	At Risk
Transitional	North Bull Island	IE_EA_090_0100	Moderate	Review
Coastal	Dublin Bay	IE_EA_090_0000	Good	Not at Risk
Transitional	Mayne Estuary	IE_EA_080_0100	Moderate (Medium confidence)	Review
Coastal	Irish Sea Dublin (HA 09)	IE_EA_070_0000	Good	Not at Risk
Transitional	Broadmeadow Water	IE_EA_060_0100	Poor	At Risk
Coastal	Malahide Bay	IE_EA_060_0000	Moderate	At Risk

Waterbody type	Waterbody	WFD code	River Waterbody WFD Status 2013-2018	WFD Risk
Transitional	Rogerstown Estuary	IE_EA_050_0100	Bad	At Risk
Coastal	Northwestern Irish Sea (HA 08)	IE_EA_020_0000	High	Review
Transitional	Nanny Estuary	IE_EA_080_0100	Moderate (medium confidence)	Review
Transitional	Boyne Estuary	IE_EA_010_0100	Moderate	At Risk
Coastal	Boyne Estuary Plume Zone	IE_EA_010_0000	Moderate	Review

A number of the transitional and coastal waterbodies are protected habitats including North Dublin Bay SAC and NHA, North Bull Island SPA, Baldoyle Bay SAC, SPA and NHA, Malahide Estuary SAC, SPA and NHA, Rogerstown Estuary SAC, SPA and NHA and Boyne Coast and Estuary SAC, SPA and NHA.

10.4.2 Groundwater

The bedrock along the DART+ Coastal North route is highly variable. The southern part of the route between Dublin city centre and Rush and Lusk is mainly underlain by a *Locally Important (Ll) Aquifer which is Moderately Productive only in Local Zones*, with some bands of *Poor (Pl) Aquifer bedrock which is Generally Unproductive except for Local Zones*, and bands of *Locally Important Aquifer (Lm) where bedrock which is Generally Moderately Productive*. North of Rush and Lusk the bedrock is more variable with areas of:

- Regionally Important Aquifer–- Karstified (diffuse) (Rkd);
- Locally Important Aquifer–- Bedrock which is Generally Moderately Productive (Lm);
- Locally Important Aquifer–- Karstified (Lk);
- Locally important gravel aquifer (Lg);
- Poor Aquifer–- Bedrock which is Generally Unproductive (Pu); and
- Poor Aquifer–- Bedrock which is Generally Unproductive except for Local Zones (Pl).

The groundwater vulnerability along the route ranges from Low to X-Extreme (Rock at surface).

There are no significant karst features identified along the DART+ Coastal North route.

There are no high yielding water supply springs and wells i.e. public water supplies or group water scheme supplies along the route corridor. No Source Protection Zones associated with public or group groundwater supply schemes are located along the route.

The route extends over the following groundwater bodies:

- Dublin (IE_EA_G_008);
- Swords (IE_EA_G_011);
- Lusk-Bog of the Ring (IE_EA_G_014);
- Balrothery (IE_EA_G_043);
- Balbriggan (IE_EA_G_039);

- Duleek (IE_EA_G_012);
- Bettystown (IE_EA_G_016); and
- Drogheda (IE_EA_G_025).

All of the groundwater bodies with the exception of Bettystown are at Good WFD Status for the 2013-2018 monitoring cycle and either Not at Risk or in Review with regard to achieving their WFD objectives. Bettystown is at Poor status and is also At Risk with regard to achieving its WFD objectives.

10.4.3 Flood Risk

Historical flooding has been assessed by examining reports and maps from the OPW's National Flood Hazard mapping. The proposed project area is impacted by both fluvial (1%AEP) and coastal flooding sources (0.5% AEP) at various locations between Dublin City Centre and Drogheda MacBride Station. Specifically, there is risk of flooding in the vicinity of Clontarf Road Station, Raheny Station, Howth Station, Sutton Station, the Malahide Viaduct, Balbriggan Station, Laytown Station Drogheda MacBride Station and Marsh Road car park. There are several surface water crossings (bridges/culverts) where flood risk could be high.

10.5 Potential Impacts

10.5.1 Construction Impacts

During the construction phase there is potential for an impact on the hydrological regime from the following:

- Potential for run-off being contaminated by a spillage or leakage of oils and fuels stored on site (or direct from construction machinery) to discharge to receiving waterbodies;
- Potential for run-off containing high loadings of suspended solids from earthworks to discharge to receiving waterbodies;
- Potential for high alkalinity run-off as a result of cementitious works adjacent to or in watercourses;
- Potential for change in the natural hydrological regime due to an increase in discharge as a result of new drainage network or in-stream works; and
- Potential for localised flooding due to disrupting local drainage systems during construction works.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

10.5.2 Operational Impacts

During the operational phase there is potential for an impact on the hydrological regime from the following:

- Potential for receiving waterbodies being contaminated by a spillage or leakage of oils and fuels from road vehicles, trains and maintenance activity;
- There is a potential that the proposed project could exacerbated any existing local flood risk due to additional crossings of watercourses or removal of floodplain area;

- There is a potential that the proposed project could exacerbated any existing local flood risk due to the increased hard standing areas at infrastructure sites such as the proposed rail depot; and
- Potential positive impacts on water quality of receiving waterbodies as historic surface water drainage network at level crossings is formalised.

11. HYDROGEOLOGY

11.1 Introduction

This section outlines the relevant policy and guidance that will be consulted to carry out the hydrogeology assessment as part of the EIAR. It also sets out the methodology for the assessment, provides a high level description of the receiving environment, and sets out the potential hydrogeological impacts during the construction and operational phases of the proposed project.

11.2 Legislation, Policy and Guidance

The assessment of groundwater will consider the impact of all phases of the development with regard to policy, plan and strategy documents, including (but not limited to) the documents listed in section 4, as well as relevant water quality legislation and guidance such as:

- European Communities Directive 2000/60/EC (Water Framework Directive);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010);
- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. No. 122 of 2014);
- European Communities (Drinking Water) (No. 2) Regulations 2007 (S.I. No. 278 of 2007);
- European Communities (Natural Habitats) Regulations 1997, (S.I. No. 94 of 1997);
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011); and
- The River Basin Management Plan for Ireland (2018-2021).

11.3 Methodology

The assessment will cover potential impacts to water quality and water level. It will describe the existing conditions and the likely potential impacts associated with the construction and operation of the proposed project.

The impact assessment process will involve:

- Review of information to highlight all relevant hydrogeological receptors in the study area.
- Assessing each hydrogeological receptor and assigning them a level of importance;
- Identifying and characterising the magnitude and significance of any potential impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts;
- Specifying appropriate monitoring; and
- Assessing the significance of any residual effects after mitigation.

A geotechnical survey and desktop review of available information regarding bedrock and gravel aquifers will provide valuable lithological data.

The ground investigation survey data will provide information regarding any underlying issues relating to the construction of the project including sensitive hydrogeologic features such as vulnerable groundwater areas with shallow aquifers, hydraulic connectivity to nearby surface waters, and surface water infiltration from run-off.

The hydrogeological assessment will consider the project and where necessary propose appropriate mitigation measures to (i) manage any alkaline run-off due to concrete pouring and (ii) manage impacts of excavations on groundwater.

11.3.1 Study Area

The study area will be defined consistent with the needs of the proposed project. A buffer of 250m is adequate in most places for the consideration of indirect impacts but a wider review will be made as some features of importance may be present within a wider area.

11.3.2 Surveys

A review of desktop information relating to the hydrogeological environment including the location of aquifers, the groundwater vulnerability in the study area and the location of drinking water wells will be conducted to determine if the proposed project activities may result in impacts on drinking water supplies.

Ground investigation (GI) surveys are taking place that will inform all infrastructural elements of the project. These are informed by the findings of a desktop survey.

Geotechnical surveys may include the installation of monitoring wells, collecting water level readings and drilling holes in areas of concern as determined by the desktop survey. Information derived from the surveys will be used to assist in determining if any hydrogeologic impacts will result as an effect of the project.

11.3.3 Consultation

The development of the EIAR will be informed by comprehensive consultation that will be undertaken with prescribed bodies, other consultees and the public. Specifically related to potential impacts on the hydrogeology environment, the following organisations will be consulted:

- Geological Survey Ireland;
- Planning departments of the relevant local authorities;
- Waterways Ireland; and
- Environmental Protection Agency (EPA).

11.4 Receiving Environment

The landcover for the study area includes artificial, recreational and urban fabric in urban and developed areas and along the railway corridor with agricultural areas in between. While there is limited historic ground investigation information along the proposed project corridor, it is anticipated that the overburden stratigraphy is comprised of up to 5m depth of made ground in urban areas.

The sub soils along the proposed project are comprised of recent fine and coarse grained alluvial, peatland, estuarine and marine sediments associated with the rivers, estuaries and marine locations.

These overlie or are adjacent to Quaternary glacial deposits derived from the underlying bedrock with widespread glacial tills including Irish Sea till adjacent to the coast.

The underlying bedrock is variable and dominated by Carboniferous limestones and calcareous shales with older Silurian deep marine sediments (mudstones, greywacke and conglomerates) indicated along the route from Skerries to Laytown and volcanic Ordovician basalt (andesite, tuff, slate & mudstone) expected in the area around Balbriggan.

11.5 Potential Impacts

11.5.1 Construction Impacts

Impacts which may occur as a result of construction activities during the project are as follows:

- Impacts on surface waters as a result of stormwater run-off causing soil erosion and sedimentation to surface waterbodies
- Discharges or releases of petroleum products from heavy equipment used during the construction phases of the Project;
- Stormwater drainage flow pattern changes in the immediate vicinity of the construction due to the introduction of BMPs.
- Potential for high alkalinity run-off recharging to ground as a result of concrete works;
- Potential for encountering contaminated lands; and
- Potential for discharges of contaminated water from tunnelling and or station excavations.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

11.5.2 Operational Impacts

During the operational phase, the potential for impact on the ground water regime may vary throughout the length of the project area based upon current hydrogeological features where bedrock is at or near the surface. Works may impact the local hydrogeology where there is removal of existing soils which could impact groundwater flow, transmission, and hydraulic conductivity in the localised areas. Indirect discharges to groundwater areas may comprise of accidental leaks or discharges at the depot, car parking areas and maintenance compounds.

12. AIR QUALITY

12.1 Introduction

This section is a high-level overview of relevant guidance and standards, the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the impact of the proposed project on air quality as part of the EIAR. This section will address both the positive and negative effects of the proposed project. The electrification of the fleet and the modal shift to electrified public transport provides a significant positive effect on air quality which will be presented in this assessment.

12.2 Legislation, Policy and Guidance

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values, or "Air Quality Standards", are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

The assessment of air quality will be conducted with consideration of additional relevant legislation and guidance including:

- Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC);
- European Union Directive on air quality assessment and management (96/62/EC) and the associated "daughter Directives", which set the Limit Values;
- Air Quality Standards Regulations 2011 (S.I. 180 of 2011), which incorporates European Commission Directive 2008/50/EC which has set limit values for the pollutants sulphur dioxide (SO2), nitrogen dioxide (NO2), particulate matter (PM10), benzene and carbon monoxide (CO);
- Air Pollution Act 1987 (No. 6 of 1987);
- Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM 2014);
- UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air Quality (UK Highways Agency 2019); and
- Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (TII 2011).

12.3 Methodology

A review of traffic impacts due to the proposed project will be carried out and if significant changes in AADT (>5%) occur, an air quality assessment will be carried out following procedures described in the publications by the EPA (EPA 2003, 2017, 2022) and using the methodology outlined in the policy and technical guidance notes, LAQM.PG(16) and LAQM.TG(16), issued by UK Department for Environment, Food and Rural Affairs (UK DEFRA 2001, 2016a, 20016b; UK Department of the Environment, Transport and Roads 1998, UK Highways Agency 2007, UK Highways Agency 2019).

The Transport Infrastructure Ireland (TII) document entitled Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (TII, 2011) provides guidance on assessment procedures, the primary aspect of which relates to existing ambient air quality and sensitive receptors. This document, although designed for road schemes, is applicable in this instance due to the linear nature of much of the scheme.

During the operational phase, the railway will be full electrified, therefore the assessment of direct emissions of particulates (PM10 and PM2.5) and nitrogen oxides (NO_2 and NO_x) has been scoped out of the operational air quality assessment.

Assessment criteria for the impact of dust during the construction phase (and any future decommissioning phase) are set out in the TII guidelines (TII 2011) and the Institute of Air Quality Management (IAQM) guidelines (IAQM 2014). These are used to assess the impact of dust emissions from construction and demolition activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. It is important to note that the predicted impacts associated with the earthworks and construction phases of the proposed project are short term and temporary in nature.

The following data sources will be referred to during the air quality assessment:

- Environmental Protection Agency – National Ambient Air Quality Monitoring Data Archive;
- Environmental Protection Agency – Air Quality in Ireland 2020 Report and previous reports (2016– 2020);
- Dublin Regional Air Quality Management Plan 2021;
- National Parks and Wildlife Service Maps; and
- Environmental Protection Agency – Integrated Pollution Control / Industrial Emissions Licences.

It is proposed that an assessment of air quality will be carried out in accordance with the following guidance and established best practice, and will be tailored accordingly based on professional judgement and local circumstance:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- EPA Advice notes on current practice in the preparation of Environmental Impact Statements (EPA, 2003) and will follow all future revisions or finalised EIA advice notes as appropriate (draft revised EPA Advice Notes for Preparing Environmental Impact Statements were published in 2015); and
- Transport Infrastructure Ireland document entitled Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (TII 2011).

In line with the above guidance, the assessment will cover potential impacts to air quality and will describe the existing conditions and the likely potential impacts associated with the construction and operation of the proposed project, both positive and negative. The impact assessment process will involve:

- Assigning the receptor sensitivity;
- Identifying and characterising the magnitude and significance of any potential impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts; and

- Assessing the significance of any residual effects after mitigation.

The air quality assessment carried out on the proposed project will include the following elements:

- Review of standards and legislation;
- Identification of air quality issues relevant to the components of the proposed project;
- Review of background ambient air quality in the vicinity of the proposed project (relevant air quality baseline data will be obtained from the EPA);
- Review of changes of emissions to atmosphere associated with the scheme from the operation of the proposed railway line using AERMOD dispersion modelling software;
- Assessment of potential impacts of plant and equipment processes on air quality; and
- Assessment of potential impacts of traffic on ambient air quality both positive and negative.

The assessment will take account of sensitive receptors relevant to the proposed project. Sensitive receptors include locations where people spend significant periods of time, such as domestic properties. Ecological receptors are habitats that might be sensitive to dust. Examples of these sensitive receptors include:

- Residential dwellings;
- Industrial or commercial uses sensitive to dust;
- Recreational areas and sports grounds;
- Schools and other educational establishments;
- Buildings of religious sensitivity;
- Designated ecological area of conservation (either Irish or European designation); and
- Hospitals and nursing homes.

A series of mitigation measures to minimise any foreseen impacts for all phases of the project will be proposed as required as part of the EIAR.

12.3.1 Study Area

The construction phase study area is focused on potential impacts generally due to dust. These impacts usually occur within 350m of the dust generating activity as dust particles fall out of suspension in the air. Impacts on roads can occur up to 500m from the gate of the site as HGVs bring dust onto public roads. Dust impacts during the construction phase due to material handling activities, including excavation and backfill, on site may typically emit dust. Deposition typically occurs in close proximity to each site and therefore the study area is limited to a 500m radius from any dust generating activities. The study area with respect to impacts from air quality emissions from vehicle and HGV movements is limited to sensitive receptors less than 200m from road links which are affected by significant changes in volume (i.e. above 10%). This study area is the same for designated areas of conservation (either Irish or European designation) with respect to ecology as the potential to impact is highest within 200m of the proposed project and when significant changes in AADT (>10%) occur.

12.3.2 Surveys

The operational phase of the proposed project is not predicted to generate any direct emissions to air. Therefore, no operational air quality surveys are required.

12.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the air quality impact assessment and potential impacts at the community level.

The following organisations may be consulted:

- Environmental Protection Agency (EPA);
- National Parks and Wildlife Service (NPWS); and
- Relevant County Councils impacted by the proposed project.

Consultation with all relevant authorities, organisations and stakeholders will continue throughout the assessment and design process.

12.4 Receiving Environment

As part of the implementation of the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA 2020). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D. In terms of air monitoring, the region of the proposed project is categorised as being in Zones A, C and D. Long-term background data at relevant EPA monitoring sites within these zones will be used to estimate background concentrations.

A desktop review of available baseline air quality data within the study area will be undertaken in detail. Air quality will vary throughout the proposed project with the highest concentrations predicted to be in proximity to the most southerly part of the route, coinciding with the city centre. Concentrations in rural parts of the scheme are predicted to be close to rural background levels.

12.5 Potential Impacts

12.5.1 Construction Impacts

During the construction (and any subsequent decommissioning) phase there is potential for an impact on air quality from construction dust and construction related traffic.

Construction phase dust emissions will potentially be caused by activities such as excavation and pavement construction and would be exacerbated by winds and dry weather. Dust tends to be deposited within 500m of the generation site, and therefore sensitive receptors which fall within this distance of significant construction activities would be most at risk.

Emissions from HGVs and on-site construction plant and equipment which may give rise to emissions including; particulates (PM10 and PM2.5), benzene, nitrogen oxides (NOx) and CO_2. Construction phase diversions and changes to traffic flows also have the potential to impact on air pollutant concentrations, however these are not predicted to be significant.

Due to the nature of the works, dust impacts in general are not predicted to be significant.

However, to minimise any potential dust emissions that are generated during construction, a series of mitigation measures will be proposed in the EIAR and will be implemented during the construction phase of the proposed project. The mitigation measures will ensure that significant impacts on sensitive receptors are minimised.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

12.5.2 Operational Impacts

The overall operational impacts from the DART+ Coastal North project will be positive on air quality through the contribution to the transition of the fleet to electrical traction and increase passenger capacity which will both assist in reducing GHG emissions from private cars. Therefore operational phase impacts on Air Quality from railway operations have been scoped out as part of the air quality assessment.

The main traffic related air quality impact during the operational phase is likely to come from the changes in level crossing closures and removal of diesel emissions from existing diesel trains through the electrification of the line. Air quality impacts due to changes in traffic flows with the closure of the level crossings will be localised, and the traffic re-routing will bring some sensitive receptors closer to traffic and some further away from sensitive receptors. Road related air emissions may generate quantities of air pollution common to vehicle emissions such as NO_2, and particulate matter (PM_{10} and $PM_{2.5}$). Of these the most pertinent is NO_2, as this has the greatest potential to exceed the air quality standards. TII's guidelines (TII 2011) state that roads should be assessed for air quality impacts where 'significant traffic changes (greater than 5% Annual Average Daily Traffic)', speeds or road alignment changes occur.

In addition to the traffic impacts, changes in emissions to atmosphere associated with the scheme from the operational phase of the proposed railway line will include particulates (PM10 and PM2.5) and nitrogen oxides (NO_2 and NO_X). It is proposed to increase the frequency of service and also change in fuel source from diesel to electricity which will impact emissions. As a result, there is a potential for air quality impacts (beneficial) on sensitive receptors, within 200m of the proposed project.

13. CLIMATE

13.1 Introduction

This section is a high-level overview of relevant guidance and standards, the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the impact of the proposed project on climate as part of the EIAR. This section will address both the positive and negative effects of the proposed project. The electrification of the fleet and the modal shift to electrified public transport provides a significant positive effect on climate which will be presented in this assessment.

13.2 Legislation, Policy and Guidance

In order to reduce the risk due to climate change, National and European statutory bodies have set targets for future greenhouse gas (GHG) emissions. Ireland has signed up to several climate agreements including the EU 2030 Climate and Energy Policy Framework (EC 2014) which aims to reduce GHG emissions by 40% compared with 1990 levels by 2030. The Climate Action Plan (Government of Ireland 2021), designed to help Ireland achieve these targets specifically states that delivery of the DART+ is an important measure for Ireland's development towards a more climate friendly future through the implementation of major sustainable mobility projects. The DART+ programme will assist with the modal shift to more sustainable transport options and away from a reliance on diesel powered transport.

The assessment of climate will be conducted with consideration of additional relevant legislation and guidance including:

- European Commission (EC) (2014) 2030 Climate and Energy Policy Framework;
- Climate Action and Low Carbon Development Act (No. 46 of 2015), as amended;
- CCAE (2013) Climate Action and Low Carbon Development – National Policy Position Ireland;
- UK Highways Agency, (2019) DMRB LA114 Climate
- Government of Ireland (2021) Climate Action Plan;
- IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance;
- Local Authority climate and planning guidance:
    - Louth County Council Climate Change Adaption Strategy 2019-2024;
    - Meath Climate Change Action Strategy 2019-2024;
    - Fingal County Council Climate Change Adaption Strategy 2019-2024; and
    - Dublin City Development Climate Change Action Plan 2019-2024.

13.3 Methodology

It is proposed that an assessment of climate will be carried out in accordance with the following guidance and established best practice, and will be tailored accordingly based on professional judgement and local circumstance:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);

- EPA Advice notes on current practice in the preparation of Environmental Impact Statement (EPA, 2003) and will follow all future revisions or finalised EIA advice notes as appropriate (draft revised EPA Advice Notes for Preparing Environmental Impact Statements were published in 2015);
- DMRB (2021) LA114 Climate; and
- IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance.

In line with the above guidance, the assessment will cover potential impacts to climate and will describe the existing conditions and the likely potential impacts associated with the construction and operation of the proposed project. The impact assessment process will involve:

- Assigning the receptor sensitivity;
- Identifying and characterising the magnitude and significance of any potential impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts; and
- Assessing the significance of any residual effects after mitigation.

The climate assessment carried out on the proposed project will include the following elements:

- Review of legislation;
- Identification of climate issues relevant to the components of the proposed project;
- Review of baseline GHG emissions;
- Assessment of potential carbon emissions from the operation of the proposed railway line;
- Assessment of potential impacts of construction plant, materials and equipment processes on climate; and
- Assessment of potential impacts of traffic on climate.

13.3.1 Study Area

The proposed project covers a linear study area. Due to the nature of climatic effects, if significant emissions occur they will have the potential to impact Ireland's national and international commitments and targets under various EU Climate Agreements and other international agreements. Therefore, the study area can be classed as Ireland.

The UK Highways Agency issued a specific guidance document (LA 114 Climate) (UK HA 2019) for climate, assessing and reporting the effects of climate (climate change resilience and adaptation), and the effect on climate of greenhouse gas from construction, operation and maintenance projects. Within this guidance a description of the study area for road related projects are provided. This states that the construction phase study area comprises of GHG emissions associated with project construction related activities/materials and their associated transport. The study area for operational phase road projects is to be the affected road network defined in a project's traffic model. Therefore, the study area has included the impacted road and rail network as set out by the traffic model.

13.3.2 Surveys

A review of most recent EPA published GHG emissions will be completed as part of the assessment.

13.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the climate impact assessment and potential impacts at the community level.

The following organisations may also be consulted:

- Climate Change Advisory Council;
- Environmental Protection Agency (EPA);
- National Parks and Wildlife Service (NPWS); and
- Relevant county councils impacted by the proposed project.

Consultation with all relevant authorities, organisations and stakeholders will continue throughout the assessment and design process.

13.4 Receiving Environment

Ireland has signed up to several climate agreements including the "2030 Climate and Energy Policy Framework" which aims to reduce GHG emissions by 40% compared with 1990 levels by 2030.

Data published in 2022 (EPA 2022) predicts that Ireland will exceed its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by 6.73 Mt. For 2020, total national greenhouse gas emissions are estimated to be 57.7 million tonnes carbon dioxide equivalent (Mt CO2eq). This is 3.6% lower (2.14 Mt CO2eq) than emissions in 2019.

Greenhouse gas emissions from the transport sector decreased by 15.7% in 2020. Total fuel use in road transport decreased by 16.3%, petrol use decreased by 25.9% while diesel use decreased by 14.4% and biofuels use also decreased. The main reason for decreases were the limits on passenger car and public transport journeys due to COVID restrictions. Passenger cars were responsible for 59% of road transport emissions.

In 2020, emissions from energy industries decreased by 7.9% on 2019, mainly because of reduced use of peat and increased renewables, such as wind, for generating electricity. Overall, GHG emissions from energy industries accounted for 15.0% of Ireland's national total emissions in 2020. Over the period 1990-2020, emissions from electricity generation have decreased by 21.2%, whereas total electricity consumption has increased by 139.5%. This decrease reflects the improvement in efficiency of modern gas fired power plants replacing older peat and oil-fired plants and the increased share of renewables, primarily, wind power along with increased interconnectivity.

Several important developments in Ireland recently relating to climate include the Climate Action and Low Carbon Amendment Act (2021), Ireland's declaration of a climate and biodiversity emergency in May 2019 and the European Parliament's approval of a resolution declaring a climate and environment emergency in Europe in November 2019. Thus, the baseline environment should be considered a sensitive environment for the assessment of impacts.

13.5 Potential Impacts

13.5.1 Construction Impacts

GHG emissions from construction (and any subsequent decommissioning) traffic and embodied energy from construction materials will increase Ireland's GHG emissions potentially contributing to climate change and are expected to be the dominant source of GHG emissions during construction of the proposed project. The impact of this will be assessed in the EIAR. Vehicles and rail stock will give rise to GHG emissions during construction of the proposed project. Emissions with the potential to cause climate change will arise from embodied carbon dioxide in site materials and removal of existing material, as well as kilometres travelled by vehicles delivering / removing this material to and from the construction sites. These emissions will be quantified using an appropriate carbon calculator and compared to Ireland's GHG legal commitments.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

13.5.2 Operational Impacts

The operational phase has the potential to have a beneficial impact on greenhouse gas emissions. Changing the DART fleet through the use of an electrified line rather than diesel fuel source has the potential to reduce greenhouse gas emissions per kilometre travelled per person and reduce congestion, which improves engine efficiency and further reduces GHG emissions.

The magnitude of change of GHG emissions will be determined as part of assessment for the proposed project.

The proposed project will assist the Climate Action Plan by providing the infrastructure which will enable an increase by 500,000 walking, cycling and public transport journeys per day by 2030.

14. NOISE AND VIBRATION

14.1 Introduction

This section is a high-level overview of relevant guidance and standards, the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the noise and vibration impact of the proposed project as part of the EIAR. This section will address both the positive and negative effects of the proposed project. The electrification of the fleet and the modal shift to electrified public transport provides a significant positive effect on noise and vibration which will be presented in this assessment.

14.2 Legislation, Policy and Guidance

There are no statutory standards in Ireland relating to noise and vibration limit values for railway sources or construction works. In the absence of specific statutory Irish guidelines, the assessment will make reference to national guidelines and standards, where available, in addition to international standards relating to noise and or vibration impact for environmental sources. The following standards and guidelines will form the main basis for the impact assessment methodologies to be adopted and for setting appropriate criteria (note that this list is not to be considered exhaustive):

- Design Manual for Roads and Bridges (DMRB). LA 111 Sustainability & Environmental Appraisal. Noise and Vibration (2019);
- The Department of Transport (UK): Calculation of Railway Noise (CRN). (DfT UK 1996).
- The Department of Transport (UK): Calculation of Road Traffic Noise (CRTN) (DfT UK 1988).
- BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise
- British Standard BS5228-2: 2009 + A1: 2014: Code of practice for noise and vibration control on construction and open sites – Vibration;
- Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII 2004);
- BS 6472-1: Guide to Evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting'. (BS 2008)
- British Standard BS7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BS 1993);
- BS8233: Guidance on Sound Insulation and Noise Reduction for Buildings – Code of Practice. (BS 2014);
- BS4142: Method for Rating and Assessing Industrial and Commercial Sound. (2014+A1:2019);
- Dublin Agglomeration Environmental Noise Action Plan (2018 – 2023) (SDCC 2018);
- ISO 9613: Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation. (ISO 1996);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (EPA, 2022);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);

- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, EPA 2015); and
- World Health Organisation (WHO): Environmental Noise Guidelines for the European Region (WHO 2018).

14.3 Methodology

In order to assess the noise impact associated with the proposed project, the following methodology is proposed:

- Review of relevant standards and legislation and setting appropriate criteria for noise and vibration;
- Baseline noise and vibration surveys will be conducted along the length of the study area to determine the existing noise and vibration environment at the most sensitive properties along the length of the proposed project;
- Identification of key sources of above ground noise and vibration issues relevant to the components of the proposed project;
- Noise and vibration impacts associated with new electrified fleet (DART) between Dublin and Drogheda will be assessed in accordance with best practice;
- Noise and vibration impacts associated with modified service frequency of commuter and intercity trains between Dublin and Drogheda will assessed in accordance with best practice;
- Cumulative noise and vibration impacts associated with all new and existing fleet serving the Dublin and Drogheda line will be assessed.
- An assessment of the noise impacts associated with the modifications to existing infrastructure or depots, and any new platforms;
- Assessment of potential impacts associated with the construction phase using current best practice guidelines and standards;
- Identification of required mitigation measures required to reduce identified significant impacts to within the adopted criteria; and
- Assessment of residual impacts following implementation of mitigation.

14.3.1 Study Area

As there are no national guidelines for the assessment of rail noise it is proposed to adopt a similar methodology to that used for the assessment of national road schemes when selecting the study area. This is considered appropriate given that both road and rail developments are similar linear infrastructure developments.

The proposed project covers an extensive linear study area between Dublin City Centre and Drogheda MacBride Station. From an airborne noise and vibration point of view, the key study areas during the construction phase include all the surrounding sensitive environments to surface construction work areas. This includes works areas around construction compounds, rail lines, stations and platforms, and construction of ancillary structures (bridges, maintenance depots etc.). Construction traffic haul routes will also be assessed as part of the study area for this phase of the works as well as at substation locations.

For both the construction and operational phases, the study area covers a considerable geographical area in close proximity to high density sensitive residential, educational, amenity, religious and commercial receptors. Depending on the sources in question and the local area under consideration, the assessment is likely to extend between 50m and 300m from operational sources.

14.3.2 Surveys

A detailed baseline study will be undertaken to characterise the existing noise and vibration environment at sensitive locations along the length of the proposed project in proximity to construction works and operational sources as noted in Section 15.3.1.

- A baseline noise study programme is being undertaken at locations which will be potentially affected by both the construction and operational phases of the project. The surveys will be undertaken through the use of monitoring installations to capture noise levels at identified sensitive areas. This will be undertaken using both attended and unattended noise monitoring programmes as follows:
    - Unattended measurements will be conducted at the selected locations to determine existing noise levels at these locations over a period of approximately 24 to 48 hours.
    - Attended measurements will be conducted at the specified locations for short-term periods in order to obtain a snapshot of the existing environment during different time periods.

All noise surveys will be conducted in accordance with ISO 1996: Description, Measurement and Assessment of Environmental Noise Part 1: Basic quantities and assessment procedures, (ISO 2016) and Part 2: Determination of Sound Pressure Levels. (2017).

14.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the noise and vibration impact assessment and potential impacts at the community level.

In addition to feedback from the public consultation process and affected landowners, the following consultees will also be consulted:

- Environmental Protection Agency (EPA);
- Iarnród Éireann (IÉ), and;
- Relevant local authorities.

Consultation with all relevant authorities, organisations and stakeholders will continue throughout the impact assessment and design process.

14.4 Receiving Environment

The proposed project traverses a mix of urban, sub-urban and rural areas and the baseline receiving noise and vibration environment will change depending on location. Notwithstanding this it is expected that for sensitive properties in close proximity to the existing rail line the baseline environment will be influenced largely by rail movements on the existing line. In some locations near major roads, it is expected that road traffic noise will also be a significant contributor to the baseline noise environment.

14.5 Potential Impacts

14.5.1 Construction Impacts

Construction noise calculations will be undertaken and assessed in accordance with current best practice guidelines to evaluate the potential impact on nearby sensitive receptors. It is anticipated that there is potential for a significant noise impact during the construction phase. In particular the following construction activities are likely to produce the highest impacts:

- Electrification of Rail Line;
    - Extension of existing 1500V DC electrification, which currently terminates at Malahide, as far as Drogheda MacBride Station.
- Reconfiguration of the existing track layout and associated infrastructure in the vicinity of Drogheda MacBride Station, Malahide Station, Clongriffin Station and Howth Junction & Donaghmede Station, as well as the provision of sections of additional track and station turnback facilities to allow for improved operational flexibility on the Northern Line;
- Construction of a new platform at Drogheda MacBride Station;
- Undertaking bridge improvements/modifications arising from capacity enhancements, track reconfigurations and/or electrical clearances to achieve necessary clearances;
- Modifications to existing depots at Drogheda and Fairview to support the new train fleet, including the provision of additional train stabling at Drogheda;
- piling works; and
- construction of substations.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

14.5.2 Operational Impacts

- Rail Traffic - Noise
    - The current and upgraded rail line will be modelled using a proprietary acoustic modelling software. The noise prediction results will be compared with current best practice guidelines. It is understood that there will be an increase in rail traffic, albeit with an increase in electrified vehicles as opposed to diesel or DMU driven vehicles. Nevertheless, it is expected that an increase in rail traffic will result in an increase in rail related noise. The outcome of the assessment is reliant on the results of the baseline surveys and noise prediction modelling. Notwithstanding this, it is understood that the numbers of rail vehicles per day are expected to more than double which would likely result in a perceptible increase in noise.
- Rail Traffic – Vibration
    - The baseline survey will measure existing rail vibration levels at sensitive locations. Review of baseline vibration surveys undertaken in 2010 for the initial phase of the proposed project indicate that vibration levels at properties adjacent to the existing rail line are below those which would be expected to cause annoyance or complaint in accordance with published guidance. Generally, the magnitude of the vibration rather than the number or duration of occurrences dictates the level of annoyance.

Given the key element of the proposed project will incorporate electrified fleet which generate lower vibration levels, at this stage it is expected vibration impacts are not likely to significantly increase during the operational phase.

- Road Traffic - Noise
    - Traffic numbers will be provided by others to inform road traffic noise predictions. The predicted road traffic noise will be assessed in accordance with national guideline values as a change in noise level for existing routes or compared with national guideline values for new routes.
- Rail Depot and Station Modification
    - Operational noise and vibration levels for the stations and depot will be calculated for the nearest sensitive receptors taking the expected activities at each location into account. Source noise levels for activities and sources will be sourced from published data and data sets from other projects. The likely level of noise and vibration emissions from the proposed project will be predicted in accordance with standard guidance.
- Traction substations
    - Operational noise and levels for the substations will be calculated for the nearest sensitive receptors and assessed.

15. LANDSCAPE & VISUAL

15.1 Introduction

This section is a high-level overview of relevant guidance and standards, the proposed methodology and a scope of work likely to be required to undertake the detailed landscape and visual effects assessment of the construction and operational phases of the proposed project as part of the EIAR.

15.2 Legislation, Policy and Guidance

The landscape and visual impact assessment is being prepared having regard to the following legislation, policy and guidelines:

- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- Planning and Development Act 2000 – 2020.
- Planning and Development Regulations 2001 – 2019.
- Dublin City Development Plan 2022-2028, Dublin City Council, 2022.
- Fingal Development Plan 2017-2023, Fingal County Council, 2017[6].
- Louth County Development Plan 2021-2027, Louth County Council 2021.
- Meath County Development Plan 2021-2027, Meath County Council 2021.
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022.
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, Environmental Protection Agency, 2003 and Draft Advice Notes for Preparing Environmental Impact Statements, Environmental Protection Agency, 2015.
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, 2017.
- Environmental Impact Assessment of Projects – Guidance on Screening, European Commission, 2017.
- Environmental Impact Assessment of Projects – Guidance on Scoping, European Commission, 2017.
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, European Commission, 1999.
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, Department of Housing, Planning and Local Government, 2018.
- Guidelines for Landscape and Visual Impact Assessment, 3rd Ed., Landscape Institute and Institute of Environmental Management & Assessment, 2013

[6] The policies within the Fingal County Council 2023-2029 Development Plan will be considered once it is formally adopted. This plan has not been adopted at the time of writing.

15.3 Methodology

The methodology for the landscape and visual impact assessment will have regard to that set out in the Guidelines on the information to be contained in Environmental Impact Assessment Reports, (EPA 2022) and will address aspects of:

- Landscape Appearance and Character;
- Landscape Context;
- Views & Prospects (from properties, amenities, general landscape);
- Landscape Significance (Designation and Protection) and Sensitivity; and
- Interactions with other environmental aspects, especially, biodiversity, and cultural heritage.

The methodology for the landscape and visual impact assessment will involve:

- A review of relevant national and local policies and objectives for landscape and visual aspects;
- Baseline on-site surveys along the study area to determine existing landscape and visual attributes and character and to locate sensitive properties;
- Determination of the direct and indirect, construction and operation stage, landscape and visual effects of the proposed electrification of the rail line between Dublin and Drogheda.
- Determination of the direct and indirect, construction and operation stage, landscape and visual effects of the proposed modifications to Drogheda MacBride station/depot and Fairview depot.
- Completion of the construction and operation stage, landscape and visual impact assessment of the proposed project, including assessment of potential cumulative effects and effects arising from interactions.
- Photomontages will be used at key locations to represent the physical and visual nature of the proposed project.
- Development of mitigation measures required to avoid, reduce and / or remediate identified significant impacts; and
- Assessment of residual landscape and visual impacts following implementation of mitigation.

15.3.1 Study Area

The study area is defined with regard to the potential for landscape and visual effects from the proposed project. The visual assessment is based on a zone of visual influence, i.e. potential for intervisibility between viewers and the development. This zone (i.e. study area) is defined by the presence of buildings, structures, vegetation and other local features which limit visibility.

The dimensions for the study area are dependent on the local landscape. In built-up urban areas, the study area typically extends to the leading edges of the buildings on either side of the linear corridor of the proposed project. However, the study area will also widen as the proposed project passes through more open lands, parks river corridors, etc.

For both the construction and operational phases, this study area covers a relatively narrow geographical corridor in close proximity to the rail line and associated road works. This includes high density areas comprising residential, educational, amenity, community and commercial receptors.

Depending on the sources in question and the local area under consideration, the assessment is likely to extend between 50m and 300m from the proposed works area.

15.3.2 Surveys

A detailed baseline study will be carried out along the length of the proposed project to characterise the baseline landscape and visual environment. As previously noted, photomontages will be used at key locations to represent the physical and visual nature of the proposed project.

15.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the landscape impact assessment and potential impacts at the community level.

In terms of the landscape and visual assessment, consultations will be carried out with the local authorities of Dublin City Council, Fingal County Council, Louth County Council and Meath County Council.

15.4 Receiving Environment

The proposed project follows the corridors of the Dublin City to Drogheda Railway corridor (including the Howth Branch), passing through a range of urban, sub-urban and more rural areas. These include developed residential and other land use areas, open spaces, agricultural lands and the canal corridor.

Sections of the corridor include designated or protected landscapes, trees and woodlands, views and structures. Significant and sensitive residential and other development, amenity and recreational facilities, trees and plantings, adjoin or are located close to the proposed project.

15.5 Potential Impacts

As noted above significant and sensitive residential and other development, amenity and recreational facilities, trees and plantings adjoin or are located close to the proposed project and as such, it is predicted that significant landscape and visual effects may arise.

15.5.1 Construction Impacts

- Removal of existing landscape features, trees, hedgerows;
- Removal of trees / woodlands identified as having objectives for tree preservation in county development plans;
- Removal of screening, impact on property boundaries, impact on properties, including demolition works;
- Effects on existing landscape and visual character
- Visual disturbance and visual intrusion on properties and amenities, from earthworks, building works, and bridge construction, including potential night-time works; and
- Effects arising from interaction with noise, dust, and sites of biodiversity and cultural heritage significance.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

15.5.2 Operational Impacts

- Residual effects on landscape and visual character and on designated landscape and visual aspects;
- Visual intrusion on properties and amenities, from new elevated structures, bridges, embankments, retaining walls, fences, barriers, gantries;
- Visual intrusion on properties and amenities, from new structures and catenary 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.

16. MATERIAL ASSETS: AGRICULTURAL PROPERTIES

16.1 Introduction

This section is a high-level overview of relevant guidance and standards, the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the agricultural property impact of the proposed project as part of the EIAR.

16.2 Legislation, Policy and Guidance

There is no specific guidance on the assessment of impact on agricultural property. The following national guidelines will form the basis for the impact methodologies to be adopted:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022);
- Advice Notes for Preparing Environmental Impact Statements (Draft), (EPA, 2015); and
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003).

16.3 Methodology

The methodology for the assessment of the impact on agricultural property includes:

- Review of relevant national guidance and setting of appropriate criteria for impact assessment of agricultural property;
- Desktop survey of project mapping and information to determine the extent of the study area;
- Baseline assessment of agricultural environment;
- Detailed agricultural property surveys involving walkover survey and landowner consultation;
- An assessment of the agricultural impacts associated with the proposed works. Property and farm enterprise information will be sourced from completed agricultural property surveys;
- An assessment of the potential impacts associated with the construction phase using best practice guidelines;
- Identification of required mitigation measures required to reduce identified significant impacts; and
- Assessment of residual impacts following the implementation of mitigation.

16.3.1 Study Area

The proposed study area extends to the agricultural property directly impacted by the proposed project, i.e. directly impacted by the Railway Order for the proposed works.

16.3.2 Surveys

The methodology for the agricultural property assessment will include roadside surveys and agricultural property landowner surveys where necessary. The roadside survey will inform the assessment of the wider baseline environment. The landowner surveys will be completed, where possible, for each agricultural property directly impacted, by the proposed project Railway Order, and will complete the baseline assessment.

16.3.3 Consultation

Consultation will take place with agricultural property landowners. Public consultation will also be carried out during the assessment and feedback from this process deemed relevant to agricultural property will be considered.

16.4 Receiving Environment

The receiving environment will include agricultural property located in both urban and rural areas. The baseline environment consists of agricultural properties involved in a range of livestock and crop-based farming enterprises and their sensitivity to direct impacts arising from the proposed project.

16.5 Potential Impacts

16.5.1 Construction Impacts

The assessment will include the following potential indirect impacts associated with construction activities:

- Noise and Dust;
    - These indirect impacts have the potential to be significant on those farming enterprises deemed sensitive to indirect noise and dust effects i.e. equine properties.
- Temporary impact on access to lands;
    - Any impact on access to lands will result in disturbance of farming operations.
- Disturbance of land drainage and services.
    - Any impact on land drainage or existing services such as water or power supplies to agricultural property may have a moderate to significant impact on agricultural properties.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

16.5.2 Operational Impacts

The operational impact assessment of the direct impacts will consider the following:

- Landtake;
    - The acquisition of agricultural lands and, where applicable, on-farm facilities may have significant impacts on individual agricultural properties. The permanent reduction in agricultural lands will result in a reduction in agricultural production. The impact on or removal of existing farm facilities will have a significant disturbance impact on the farming operations.
- Severance and / or permanent impact on access to lands;
    - Any severance or permanent impact on access to lands may have significant impact on the day to day operation of agricultural properties. The closure of level crossings may result in disturbance of farming operations due to increased travel journey times.

17. MATERIAL ASSETS: NON-AGRICULTURAL PROPERTIES

17.1 Introduction

This section is a high-level overview of relevant guidance and standards, the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the non-agricultural property impact of the proposed project as part of the EIAR.

17.2 Legislation, Policy and Guidance

There is no specific guidance on the assessment of impact on non-agricultural property. The following national guidelines will form the basis for the impact methodologies to be adopted:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022);
- Advice Notes for Preparing Environmental Impact Statements (Draft), (EPA 2015); and
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA 2003).

17.3 Methodology

The methodology for the assessment of the impact on non-agriculture property includes:

- Review of relevant national guidance and setting of appropriate criteria for impact assessment of non-agricultural property;
- Desktop survey of project mapping and information to determine the extent of the study area;
- Roadside survey of non-agricultural areas impacted by the proposed works;
- Review of all relevant submissions and stakeholder consultations;
- Baseline assessment of non-agricultural property environment;
- Detailed non-agricultural property surveys involving walkover survey and landowner consultation;
- An assessment of the non-agricultural property impacts associated with the proposed works. Property information will be sourced from completed non-agricultural property surveys;
- An assessment of the potential impacts associated with the construction phase using best practice guidelines;
- Identification of required mitigation measures required to reduce identified significant impacts; and
- Assessment of residual impacts following the implementation of mitigation.

17.3.1 Study Area

The proposed study area extends to the non-agricultural property directly impacted by the proposed project, i.e. directly impacted by the Railway Order for the turnback's, depot modifications, substations and any other associated works outside of the existing IÉ property boundary.

17.3.2 Surveys

The methodology for the non-agricultural property assessment will include roadside surveys and non- agricultural property landowner surveys where necessary. The roadside survey will inform the assessment of the wider baseline environment. The landowner surveys will be completed, where possible, for each non-agricultural property directly impacted, by the proposed project Railway Order, and will complete the baseline assessment.

17.3.3 Consultation

Consultation will take place with non-agricultural property landowners. Public consultation will also be carried out during the assessment and feedback from this process deemed relevant to non-agricultural property will be considered.

17.3.4 Receiving Environment

The receiving environment will include non-agricultural property located in both urban and rural areas. The baseline environment may consist of non-agricultural properties including residential, commercial, community and development lands.

17.4 Potential Impacts

17.4.1 Construction Impacts

The assessment will include the following potential indirect impacts associated with construction activities:

- Noise, Vibration & Dust;
    - These indirect impacts will be a source of disturbance on non-agricultural properties and, in particular, on residential properties.
- Access – Temporary impact on property access;
    - Any impact on access to properties will result in disturbance.
- Disturbance of land drainage and services.
    - Any impact on land drainage or existing services such as water or power supplies to non- agricultural property may have a significant impact.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

17.4.2 Operational Impacts

The operational impact assessment of the direct impacts will consider the following:

- Landtake;
    - The acquisition of non-agricultural property, curtilage or lands may have very significant impacts on non-agricultural properties.
- Permanent impact on property access;
    - Permanent impact on property access may have significant impact on non-agricultural properties.

18. MATERIAL ASSETS: UTILITIES

18.1 Introduction

This section describes the scope of work and methods to be applied in the identification and assessment of impacts on utilities associated with the proposed project.

18.2 Legislation, Policy and Guidance

The utilities assessment will require a comprehensive plan and strategy review, including (but not limited to) the documents listed in section 4 of this report.

18.3 Methodology

A desktop study will be conducted with the information provided by a number of utility providers and relevant local authorities. Details of the locations of infrastructure and utilities as well as service data gathered through consultation with the relevant service providers, will be obtained for the EIAR.

The assessment of the impact on utilities will be carried out in accordance with the EPA's current EIA guidance documents listed in Section 4 of this Report. The assessment will cover potential impacts on utilities and will describe the existing conditions and the likely potential impacts associated with all phases of the proposed project, including construction and operation. The impact assessment process will entail:

- Identification of the utility and associated infrastructure connections and diversions required;
- Identification and characterisation of the magnitude and significance of any potential impacts;
- Incorporation of the measures to mitigate these impacts; and
- Assessment of the significance of any residual effects after the mitigation.

18.3.1 Study Area

The study area will comprise all areas of proposed construction and operational work for the proposed project including areas where utility and infrastructural diversions are proposed. There are a large number and variety of utility providers which traverse the proposed project, this includes and is not limited to, storm water mains, electricity, gas and telecommunications. Road infrastructure will be addressed under traffic and transport.

18.3.2 Surveys

Additional survey requirements will be identified following a desktop review of available data.

18.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The development of the EIAR will be informed by comprehensive consultation that will be undertaken with prescribed bodies, other key consultees, relevant service and utility providers and public.

18.4 Receiving Environment

Due to the nature of this built-up area there are extensive utilities present including:

- Electricity – ESB underground HV / MV / LV ducts;
- Electricity – ESB overhead HV cables;
- Electricity – ESB overhead MV cables;
- Electricity – ESB overhead LV cables;
- Gas – GNI underground HP duct;
- Gas – GNI underground MP duct;
- Gas – GNI underground LP duct;
- Telecom – Virgin underground duct;
- Telecom – Eircom underground duct;
- Telecom – Other fibreoptic cables;
- Water – IW water main;
- Water – IW gravity line;
- Water – storm water.

Baseline data collection is ongoing across the study area and will establish utilities that will inform designs and the EIAR process.

18.5 Potential Impacts

18.5.1 Construction Impacts

The main potential construction phase impact will result from the requirement for temporary utility diversions and diversions of existing utilities.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

18.5.2 Operational Impacts

The main potential operational effects will result from the electricity generation to power the project. Other effects will include effects to:

- Surface water drainage infrastructure;
- Permanent diversions and alterations to the existing transport network; and
- Additional electrical connections.

19. MATERIAL ASSETS: RESOURCE AND WASTE MANAGEMENT

19.1 Introduction

This section describes the scope of work and methods to be applied in the identification and assessment of impacts with regards to resource and waste management associated the proposed project. In this context, the term 'waste' refers to unusable or unwanted materials that may arise during the active construction of infrastructure and operation of the proposed project.

19.2 Legislation, Policy and Guidance

The resource and waste management assessment will require a comprehensive policy, plan and strategy review, including (but not limited to) the documents listed in section 4 of this report and:

- The EU Waste Framework Directive (2008/98/EC);
- Waste Management Act 1996 (No. 10 of 1996) as amended;
- Eastern- Midlands Region Waste Management Plan 2015-2021 (DCC 2015);
- National Hazardous Waste Management Plan 2014- 2020 (EPA 2014);
- Whole of Government Circular Economy Strategy 2022-2023 (DECC 2020);
- Relevant County Development Plans; and
- Relevant Local Area Plans.

19.3 Methodology

It is proposed that an assessment of resource and waste generation will be carried out in accordance with the EPA's current EIA guidance documents as well as the below guidelines and established best practice, and will be tailored accordingly based on professional judgement and local circumstance:

- The Management of Waste from National Road Construction Projects (TII 2017a);
- 'Guidance on Soil and Stone By Products' (EPA 2019) (Guidance on classification and notification of soil and stone as a by-product in the context of article 27 of the European Communities (Waste Directive) Regulations 2011 (EPA 2017);
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects (DoEHLG, 2006); and
- CIRIA publication 133 Waste Minimisation in Construction (CIRIA 1997).

In line with the above guidance, the assessment will cover potential impacts of waste generation and will describe the existing conditions and the likely potential impacts associated with all phases of the proposed project. The impact assessment process will involve:

- Assigning the receptor sensitivity;
- Identifying and characterising the magnitude and significance of any potential impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts; and
- Assessing the significance of any residual effects after mitigation.

19.3.1 Study Area

The study area for the purposes of resource and waste management is the footprint of the proposed project including the associated soil storage areas and compound sites. The study area will also be expanded beyond the footprint (if required) for the purposes of identifying suitable materials and waste management facilities and locations.

19.3.2 Surveys

Sufficient information will be obtained from desktop studies and surveys completed for other chapters e.g. ground investigations to inform the assessment.

19.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the EIAR and potential impacts at the community level.

19.4 Receiving Environment

A desktop study will be undertaken to identify materials and wastes that will be used and produced and potentially require management as a result of the proposed project once outline design information is available. Management plans for materials and waste will identify opportunities to minimise materials use and waste production and will also identify suitable re-use opportunities for the materials (as a by- product) as well as waste management facilities licensed by the EPA and facilities holding waste facility permits or certificates of registration from Local Authorities. Documentation pertaining to the above-mentioned facilities will be studied to estimate capacity and usability of the facility for the proposed project.

19.5 Potential Impacts

19.5.1 Construction Impacts

Potential impacts during construction may include:

- Production of additional spoil material, arising from excavating material unsuitable for reuse such as vegetation, pile arisings and contaminated soils;
- Debris and waste from the site could be a source of nuisance to neighbouring communities as well as having a negative impact on the appearance of the site;
- Excavation of possible contaminated lands and materials which would require disposal off site at a suitably licensed facility;
- Waste generation from construction may cause a number of direct and indirect impacts on other environmental factors such as air quality (dust, odours), traffic, noise, soils (contaminated land), geology, water, health etc.; and
- Surplus materials and waste may occur where material supply exceeds material demand.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

19.5.2 Operational Impacts

There are not expected to be any significant operational waste quantities.

20. ARCHAEOLOGY & CULTURAL HERITAGE

20.1 Introduction

This section describes the scope of works and methods to be applied in the identification and assessment of archaeological and cultural heritage impacts associated with the proposed project. A high-level overview of the baseline conditions is included, together with the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the impact of the proposed project as part of the EIAR.

20.2 Legislation, Policy and Guidance

The assessment of the archaeological and cultural heritage resource will be conducted under the relevant legislation and planning frameworks applicable to the Republic of Ireland. These include:

- National Monuments Acts, 1930-2004;
- The Planning and Development (Strategic Infrastructure) Bill, 2006;
- The Planning and Development Act 2000, as amended;
- Heritage Act, 1995, as amended;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- Draft Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the information to be contained in environmental impact assessment reports (EPA 2022);
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.

20.3 Methodology

The assessment will adopt the following approach:

An assessment of the impact of the proposed project by a comprehensive study of the potential direct, indirect, residual and cumulative impacts of the proposed project. This will include, where applicable, visual impacts on archaeological and cultural heritage assets. Full consultation with the relevant statutory bodies will be carried out during the course of the assessment.

A systematic search will be undertaken of all readily available and relevant documentary sources. These will include, but are not exclusive to the:

- Record of Monuments and Places for local authorities Louth, Meath, Fingal and Dublin City;
- Sites and Monuments Record for local authorities Louth, Meath, Fingal and Dublin City;
- Monuments in State Care Database;
- Preservation Orders;
- Register of Historic Monuments;

- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Relevant County Development Plans; and
- Excavations Bulletin (1970-2019).

The desktop assessment will be accompanied by a field inspection of the proposed project area. The field survey will confirm the accuracy of the information collected during the desktop study and will also assess any additional previously unrecorded sites of archaeological and cultural heritage merit, which could be significantly affected by the proposed project.

20.3.1 Study Area

The study area that will be subject to assessment as part of the proposed project will include the proposed project extents and an area measuring 250m from the edge of the proposed project extents. This area will be assessed for known and previously unrecorded sites and areas of archaeological and cultural heritage significance. Potential impacts upon the archaeological and cultural heritage resource will be identified along with mitigation measures designed to reduce or completely remove any negative direct or indirect impacts.

20.3.2 Surveys

A field inspection of the proposed project will be carried out as part of the archaeological and cultural heritage assessment. This will be designed to confirm the presence of recorded features within the landscape and identify any further archaeological or cultural heritage sites that may be affected by the development. Field inspections will commence upon confirmation of the scheme extents and proposals. Following consultations with the relevant consultees, further surveys such as geophysical survey may be required.

20.3.3 Consultation

Public consultations will be carried out at various intervals throughout the EIA process. The feedback received as part of this EIA process will be considered and will inform the EIAR and potential impacts at the community level. The National Monuments Service of the Department of Housing, Local Government and Heritage, along with the relevant local authorities Louth, Meath, Dublin City and Fingal County will be consulted as part of the EIA process.

20.4 Receiving Environment

The receiving environmental of the proposed project is formed by a variety of landscapes, including the urban core of Dublin City and Drogheda; suburbs such as Skerries and Donabate and more open agricultural landscapes within portions of local authorities Fingal, Louth and Meath.

Sensitive receptors identified for the purpose of this study are:

- National Monuments in State care, as listed by National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage;
- Sites with Preservation Orders (PO);
- Sites listed in the Register of Historic Monuments;

- Record of Monuments and Places (RMP) and the Sites and Monuments Record (SMR) from the Archaeological Survey of Ireland;
- Designated Zones of Notification (Areas of Archaeological Potential); and
- General Areas of Archaeological Potential.

Key sources of information relating to features identified within these databases have been verified by aerial imagery, Ordnance Survey historic mapping and information contained within the relevant Development Plans, namely Dublin City, Fingal, Meath and Louth. There are no National Monuments, sites listed with preservation orders or recorded on the register of historic monuments within the study area.

Prior to the advent of the railway, the land within the study area was largely open green fields set within a coastal context, with a number of inlets and rivers punctuating the coastline. All environments have an inherent archaeological potential and this potential is borne out in townlands where there are recorded archaeological sites, in addition to more recently discovered sites identified through aerial photography, geophysical survey and archaeological testing. These sites suggest that the wider area was a focus for both prehistoric and historic activity. Archaeological activity and settlement history of this coastline is well documented, and the area is known to have been occupied from the prehistoric period into the Early Medieval period and medieval period when the Anglo - Normans began asserting their claim on the land which is especially evident in the town of Drogheda.

Drogheda developed at a fording point in the River Boyne, granting the settlement the name of Droichead Átha or 'The Bridge of the Ford'. The earliest bridge was constructed sometime after the mid-12th century, with the Anglo-Norman medieval walled town of Drogheda developing on the banks of the river. The Boyne Viaduct crosses the River Boyne 330m east of the Zone of Archaeological Potential for the historic town of Drogheda, Co. Louth (RMP LH024-041). The Delvin River forms the county boundary between Dublin and Meath on the south end of Gormanston Beach. Shell middens, a passage tomb cemetery, barrow and fulacht fiadh at Bremore townland suggest activity from the Mesolithic period to the Bronze Age in this area (RMP DU002-001001/2/3/4/5/6, DU002-013) as well as later activity in the form of field systems. According to Hartnett (1957)7 the Bremore/Gormanston group of tombs represent the point of entry at a 'natural landing point' of the 'Fourknocks Group' and mark the western expansion of this culture along the Delvin River.

Balbriggan was a small fishing village until the 18th century, with the 1659 census showing only 30 inhabitants. It became more of an industrial centre in the 18th century, partly due to the development of the harbour in 1761. A historical assessment of an extensive area of open ground between Mill Street and George's Hill indicated industrial activity from the late 18th century onwards (Swan 20008; Licence 99E0727). The pier and cove at Balbriggan were important strategic locations on the coastline and this was one of a number of areas which was defended during the Napoleonic Wars of 1803-1815 with the construction of a Martello tower (RMP DU002-004). The Balbriggan Viaduct crosses the mouth of the Bracken River at Balbriggan Harbour where the site of a ford is indicated on the First Edition 6-inch Ordnance Survey map (1837).

Rogerstown Estuary north of Donabate is where the wetlands and saltwater marsh are spanned by a viaduct. A large number of Mesolithic flint artefacts have been collected along the coast from Howth to Balbriggan and the estuary would have been ideal for Mesolithic hunting and gathering activities.

[7] Excavation of a Passage Grave at Fourknocks, Co. Meath, P.J. Hartnett, Proceedings of the Royal Irish Academy: Archaeology, Culture, History, Literature (Vol. 58 (1956/1957), pp. 197 – 277.
[8] Swan, D.L., 2000, "Mill Street/George's Hill, Balbriggan", in Bennett, I. (ed.) Excavations 1999. Bray.

Permanent settlement was established early in this landscape, with a Neolithic house having been identified in Rogerstown overlooking the estuary (SMR DU008-110; Licence 10E0121). Archaeological sites dating to the Bronze Age, early medieval period and the medieval period have been identified on both sides of this estuary, with a cluster of monuments occurring in Rogerstown c. 1km northeast of the railway and the viaduct.

The Dublin and Drogheda Railway began operating in 1844 and the branch line to Howth opened in 1846. The Fingal Industrial Heritage Survey (FIHS) does not include the railway line itself as an item of industrial heritage interest, though it does list the 19th century stations located along it (Balbriggan, Skerries, Rush and Lusk, Donabate, Malahide and Portmarnock. Both Balbriggan and Malahide stations were designed by George Papworth). The introduction of the railway attracted further development and visitors. Industrial features were constructed at this time to support the railway, including, for example, coke ovens on the west side of the Balbriggan viaduct to supply fuel and tramlines which linked the ovens to the quay and the railway.

Excavations and testing as a result of predevelopment investigations have revealed archaeological remains in close proximity to the railway line at Barnageeragh, Beaverstown and at Drumnigh townlands. An examination of aerial imagery has also revealed cropmarks adjacent to the railway line, for example at Colp East (Google Earth 2021), Ministown (Apple Maps 2018) and Effelstown (Fairey Survey of Ireland (FSI) 578/7 1972).

Sites that are be considered to represent cultural heritage assets specifically relate to the existing railway and associated infrastructure. Where any such sites or structures are listed within the record of protected structures or National Inventory of Architectural Heritage, they are addressed within the architectural heritage section of this report.

20.5 Potential Impacts

20.5.1 Construction Impacts

- There is potential for archaeological sites to be revealed in the vicinity of the railway as evidenced in the past with excavations discovering previously unknown buried remains. This will require resolution either by preservation in situ, preservation by design and/ or preservation by record.
- It is possible that the construction of the proposed project will result in a significant negative impact on recorded monuments and/ or their surrounding zone of notification. Archaeological assessment and investigation will take place to inform the level of potential in sensitive areas.
- It is possible that ground works in any greenfield areas may results in direct negative impacts upon previously unrecorded archaeological sites that survive with no above ground expression. Impact may range from moderate to profound, dependent on the nature of the remains encountered. Potential negative impacts will be removed with the provision of archaeological mitigation in the form of predevelopment investigations or archaeological monitoring during construction.
- It is possible that built elements associated with the existing railway may be significantly and directly impacted upon by the proposed project. Impacts may occur in relation to bridges across the canal and railway, as well as the closure of level crossings, which have formed part of the character of the railway since it was constructed.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

20.5.2 Operational Impacts

No significant impacts are predicted to negatively affect the archaeological or cultural heritage resource during operation.

21. ARCHITECTURAL HERITAGE

21.1 Introduction

This section describes the scope of works and methods to be applied in the identification and assessment of architectural heritage impacts associated with the proposed project. A high-level overview of the baseline conditions is included, together with the proposed methodology and a scope of work likely to be required to undertake a detailed assessment of the impact of the proposed project as part of the EIAR.

21.2 Legislation, Policy and Guidance

The assessment of the architectural heritage resource will be conducted under the relevant legislation and planning frameworks applicable to the Republic of Ireland. These include:

- The Planning and Development Act 2000 as amended;
- Heritage Act, 1995, as amended;
- National Monuments Acts, 1930-2004;
- The Planning and Development (Strategic Infrastructure) Bill, 2006;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- Draft Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the information to be contained in environmental impact assessment reports (EPA 2022);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000; and
- Architectural Heritage Protection Guidelines for Planning Authorities, 2011, DoAHG.

21.3 Methodology

The assessment will adopt the following approach:

An assessment of the impact of the proposed project by a comprehensive study of the potential direct, indirect, residual and cumulative impacts of the proposed project. This will include, where applicable, visual impacts on architectural heritage assets. Full consultation with the relevant statutory bodies will be carried out during the course of the assessment.

A systematic search will be undertaken of all readily available and relevant documentary sources. These will include, but are not exclusive to the:

- Record of Protected Structures for local authorities Louth, Meath, Fingal and Dublin City;
- National Inventory of Architectural Heritage for local authorities Louth, Meath, Fingal and Dublin City;
- Cartographic and written sources relating to the study area; and
- Relevant county development plans.

The desktop assessment will be followed by a field inspection of the proposed project area. The field survey will confirm the accuracy of the information collected during the desktop study and will also assess any additional previously unrecorded structures of architectural heritage merit, which could be significantly affected by the proposed project.

21.3.1 Study Area

The study area that will be subject to assessment as part of the proposed project will include the proposed project extents and an area measuring 250m from the edge of the proposed project extents. This area will be assessed for known and previously unrecorded structures of architectural heritage significance. Potential impacts upon the architectural heritage resource will be identified along with mitigation measures designed to reduce or completely remove any negative direct or indirect impacts.

21.3.2 Surveys

A field inspection of the proposed project will be carried out as part of the architectural heritage assessment. This will be designed to confirm the presence of protected structures within the landscape and identify any further architectural heritage sites that may be affected by the development. Each structure of architectural heritage value will be surveyed, and the potential impacts assessed and presented in the EIAR.

21.3.3 Consultation

The Architectural Advisory Unit of the Department of Housing, Local Government and Heritage, along with the relevant local authorities for Counties Louth, Meath, Dublin City and Fingal County will be consulted during the development of the proposed project and the preparation of the EIAR.

21.4 Receiving Environment

Identified sensitive receptors for the purpose of this study are:

- Structures included in the Records of Protected Structures, in the Development Plans of Dublin City, Fingal, Meath and Louth County Councils;
- Architectural Conservation Areas included in the Development Plans of Dublin City, Fingal, Meath and Louth County Councils;
- Buildings included in the National Inventory of Architectural Heritage's Building Survey;
- Gardens included in the National Inventory of Architectural Heritage's Garden Survey;
- Designed Landscapes as identified with reference to aerial photographs, Ordnance Survey and historic mapping; and
- Other Structures of Built-Heritage Interest as identified with reference to aerial photographs, Ordnance Survey and historic mapping.

The railway 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, with Howth Junction & Donaghmede Station opened on 30 October 1848. 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, which has been operated by Iarnród Éireann since 1987.

While some of the old line has been replaced over the years, the route has been in operation since the nineteenth century.

There are station buildings at Drogheda, Laytown, Gormanston, Balbriggan, Skerries, Rush and Lusk, Donabate, and Malahide, which are of significance for reasons including their architectural, artistic, technical, and industrial heritage interest. Structures of note within the station complexes include the station buildings, station master's houses, train sheds and warehouses, signal boxes and water towers. These features have various designations, with all included in one or more of the following inventories: NIAH, RPS and Industrial Heritage Records.

There are viaducts at Drogheda, Laytown, Gormanston, Balbriggan, Rogerstown and Malahide which are protected structures. The Boyne viaduct may be the most significant structure on the route in architectural and technical terms. It is 526m long, located to the north of Drogheda railway station. The structure is comprised of 18 spans, with a three-span lattice truss of 168.75 m total length and repeating masonry arches 20.8m long. The original structure was designed by Sir John McNeill, and opened in 1855. The three spans over the river were replaced in 1932, with iron trusses, designed by G.B. Howden. The Boyne Viaduct has a number of designations (NIAH, RPS and Industrial Heritage). Due to its impressive height, the bridge is described as an 'awesome presence' on the Drogheda skyline (NIAH 2021).

There are seven bridges along the railway line which are designated as protected structures. They are at Balbriggan, Tankardstown[9], Skerries, Donabate, Kilcrea, Malahide and Clongriffin. In addition to these structures, there are other bridge structures and crossings, along the line which are of architectural interest but which are not included in any existing inventories.

The historic landscape character through which the railway traverses includes the historic towns and settlements of Drogheda, Laytown, Balbriggan, Donabate and Malahide, and all of these settlements feature buildings which are included in the NIAH and RPS. There are two designated Architectural Conservation Areas (ACAs) in the vicinity of Drogheda MacBride Station: at Ship Street, and at Railway Terrace, and the historic core of Malahide is also an ACA. There is an ACA in Laytown, encompassing Victoria Terrace, but it is remote from the railway line.

There are also historic landscapes and gardens which were established prior to the construction of the railway line. The most substantial and significant surviving landscapes are Ardgillan and Malahide Castle Demesnes which are also designated ACAs. Newbridge Demesne is another substantial historic landscape which is relatively intact, while Hampton Demesne has been diminished in modern times.

21.5 Potential Impacts

21.5.1 Construction Impacts

- It is possible that works associated with the electrification of the railway line, may have a direct significant negative impact on protected structures associated with the railway. These include bridges and railway as well as built infrastructure.
- Potential impacts on any ACAs within the overall study area.

[9] The description in the Fingal County Development Plan 2017 – 2023, Appendix 2 Report of Protected Structures notes the following: '*Mid 19th century single-arch railway bridge over road (Possible error - appears that report relates to bridge already protected under RPS No. 12 but co-ordinates positioned on small pedestrian bridge*)'.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

21.5.2 Operational Impacts

It is possible that significant indirect negative impacts may occur during the operation of the proposed project, where it is located in close proximity to architectural heritage structures.

22. ELECTROMAGNETIC COMPATIBILITY & STRAY CURRENT

22.1 Introduction

This section describes the scope of work and methods to be applied in the identification and assessment of impacts arising from Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI) as a result of the proposed project.

EMF comprises an electric field and a magnetic field and are emitted from both natural and manmade sources in the environment. All sources of EMF below 300 GHz in the electromagnetic spectrum are considered Non-Ionising Radiation, which means the EMF does not carry enough energy to remove an electron from its atomic structure.

Sources of EMF in the existing environment include items such as electrical equipment, power lines, telephone lines, signals from existing telecommunications masts (mobile phone and radio), underground communication cables, electrified trains, broadcast transmitters etc. The emissions from these sources combine to make up the current baseline environment.

The proposed project will be an electrified Direct Current (DC) rail system. The construction and operation of the new system poses the potential for EMI on receptors. The following potentially sensitive receptors will be considered as part of the EIAR:

- Local residents and the community;
- Domestic and industrial electrical equipment;
- Telecommunications infrastructure (including wireless radio services);
- Sensitive medical and research equipment;
- Utilities; and
- Mainline rail, suburban rail and light rail systems.

22.2 Legislation, Policy and Guidance

The proposed project will be required to comply with the requirements of the European Directive on Electromagnetic Compatibility (2014/30/EU), and European Standards EN 50121 (Parts 1-5), which address railway Electromagnetic Compatibility (EMC). In addition, all electrical and electronic products placed on the market or taken into service in the European Union must comply with all applicable directives which include the above EMC Directive, the Low Voltage Directive (2014/35/EU) and the Radio Equipment Directive (2014/53/EU). These Directives have been transposed into Irish law under the following statutory instruments).

- S.I. No– 145/2016 - European Communities (Electromagnetic Compatibility) Regulations 2016;
- S.I. No– 248/2017 - European Union (Radio Equipment) Regulations 2017; and
- S.I. No– 345/2016 - European Union (Low Voltage Electrical Equipment) Regulations 2016.

It is proposed to assess the proposed project's required compliance in accordance with the above Directives and standards in addition to guidelines on limiting exposures to electromagnetic fields as published by the International Commission on Non-Ionising Radiation Protection (ICNIRP) and the EU EMF Recommendation (1999/519/EC) when addressing human health effects.

The Electromagnetic Compatibility Directive (2014/30/EU) and the Radio Equipment Directive (2014/53/EU) do not cover emissions from DC and near DC fields which are also an interference risk to particularly sensitive equipment such as Scanning Electron Microscopes (SEMs) and Magnetic Resonance Imaging (MRI) equipment. Nonetheless an assessment of this type of EMI will be included in the scope of the investigation.

Potential impacts from stray currents arising from the operation of the system will also be covered as per European Standard EN 50122-2.

22.3 Methodology

Pre-existing information will be supplemented by a desktop study with a review of all currently available information.

In order to facilitate a detailed investigation of EMI, sensitive locations along the route will be selected and predicted levels for these areas estimated based on modelling and the maximum allowable limits imposed on the proposed project by industry standards (such as EN 50121). These locations will be selected based on a review of consultations with stakeholders, GeoDirectory information, a route tour and previous knowledge from working in the area.

Particularly sensitive sites such as hospitals and research facilities will be provided with a questionnaire to list any equipment that they perceive to be most at risk from EMI (such as SEMs, MRIs etc.) and will be requested to include the physical location within each campus of these pieces of equipment.

To ensure other potentially sensitive sites/equipment are not overlooked, locations such as business parks, innovation campuses, etc. within 100m of the proposed alignment will also be provided with questionnaires where required.

Predicted levels of emissions will be estimated based on design stage details for the new system with respect to the electrification scheme, signalling and communications systems to be used. This includes the voltage and currents loads that will drive the trains as well as the physical supply provided by the ESB and the associated substations. All details of the proposed project will be assessed including the proposed electrification scheme, overhead lines, signalling, public interfaces, ESB and telecoms operators.

The Electromagnetic Interference and Radiation Assessment will be carried out in accordance with the following:

- Guidelines on the information to be contained in Environmental Impact Assessment reports (EPA 2022);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Assessments (EPA 2003);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA 2015); and

- All relevant existing or emerging national and European legislation.

Compliance with relevant standards and guidelines shall be achieved through design studies, mitigation measures and verification testing/modelling.

The significance of the impact for each identified receptor, or group of receptors, will be evaluated according to the impact magnitude for electric fields (units of volts per meter, V/m) and magnetic fields (units of microTesla, µT) combined with the baseline rating assigned for each receptor. The limits used will be derived in consideration of the European standards for the receptor equipment and the known susceptibility of sensitive apparatus. For example, a DC magnetic field limit of 1,000 µT is based on the implantable medical devices standard EN 45502-2-1 which requires units to comply with this exposure level.

Characterisation of the baseline environment will be assisted by carrying out baseline measurements of the pre-existing electromagnetic environment at selected locations along the route determined to be sensitive in nature. Sensitive facilities will be identified such as hospital laboratories and research facilities. Relevant bodies will be consulted including utility providers and Comreg.

In relation to human health with respect to EMF, the predicted levels of electromagnetic emissions will be assessed in relation to the International Commission on Non-Ionizing Radiation Protection (ICNIRP) general public guideline limits. This will involve comparing the predicted emission levels across the electromagnetic spectrum from the proposed project to the guideline limit levels.

22.3.1 Study Area

The EMI field strength dissipates over distance. The precise distance at which EMI could be considered not an influence will very much depend on the sensitivity of individual receptors. The protection distance provided in the European Directive on Electromagnetic Compatibility (2014/30/EU) is 10m and therefore all systems located 10m or greater from the rail system should not encounter radio frequency interference.

If extremely sensitive equipment used in medical, research or manufacturing facilities is identified outside 10m (up to 100m), these will be assessed for any potential impacts.

The EMC study area will only affect the section of the scheme where new electrification infrastructure will be included (i.e. between Malahide and Drogheda).

22.3.2 Surveys

The approach to surveys is to produce calculations of the magnetic field caused by the different sources to understand the distance where the magnetic field causes decreases to a value below the exposure limit. The distance will be calculated for:

- Power Transformers (located in TPS): it is expected that the magnetic field decreases to a value below the exposure limit at a distance of somewhere between 3-6m;
- OHLE including feeders: taking into account calculations it is expected to justify that it is not necessary to extend the survey beyond 40m from the OHLE centre line; and
- HV Cables.

Once these calculations and the conclusions are known, the required survey area will be specified.

22.3.3 Consultation

Where reasonable consultation will be undertaken with some of the larger potentially affected stakeholders such as hospitals, universities, utility providers etc. to establish what particularly sensitive equipment they have, and where it is located on their campuses, to determine proximity to the proposed alignment. Based on these consultations, additional baseline surveys or modelling may also be required.

22.4 Receiving Environment

The receiving environment is a combination of a standard urban and a sub-urban environment with stretches through rural areas also. There are residential, commercial, and industrial land uses, along with educational facilities, buried utilities and telecommunication equipment. Outside of the urban environment, the development passes mostly through farmland.

22.5 Potential Impacts

22.5.1 Construction Impacts

During construction there are not expected to be any large-scale electrical installations that could generate significant levels of EMI such as substations or the operation of additional high voltage or high current carrying cables. Therefore, the construction phase of projects such as this tend to be quiescent from an electromagnetic perspective. No impacts on the public from an EMI, EMF or stray current perspective are envisaged during the construction phase of the proposed project. This will be assessed further in the EIAR.

Decommissioning is also assessed and is generally similar to, but of even less impact than the construction effects.

22.5.2 Operational Impacts

Electromagnetic emissions may be generated by either the power supply system such as electrical sub stations, the current supply system along the route, or the propulsion system onboard the rolling stock. The proposed project itself could be susceptible to external electromagnetic fields that are generated by sources such as electricity cables and local radio-frequency (RF) transmitters.

Stray currents may occur on several potential receptors including buried tanks, water pipes and utilities running parallel to the system. The entry/exit points of these potential receptors for the stray current may experience corrosion over time without adequate mitigation measures.

Rail systems can generate transient emissions that are not controlled by EMC regulations. Such transients can pose a threat to the operation of neighbouring electrical and electronic equipment.

Large electrical installations can also cause voltage fluctuations on the public supply that can cause the phenomenon of flicker. Flicker is evident when lighting dims and can cause a nuisance to local residents and other sensitive receptors. This will be assessed and mitigated as appropriate by the power profile of the current draw from the proposed system. The current change will be gradual rather than a step change and comply with the requirements set out in the connection agreement with the electricity distribution network operator.

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 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 project. This will be assessed further as part of the EIAR.

23. MAJOR ACCIDENTS & DISASTERS

23.1 Introduction

This section describes the scope of work and methods to be applied in the identification and assessment of the effects on the environment arising from the vulnerability of the proposed project to the risk of major accidents and disasters.

23.2 Legislation, Policy and Guidance

The EIAR will require a comprehensive policy, plan and strategy review, including (but not limited to) the documents listed in Section 4, and the EIA Directive (2014/52/EU) lists the factors which must be assessed with respect to environmental impact in Paragraph 1. Paragraph 2 of Article 3 states:

> *'The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned*.'

Annex III of the directive lists the characteristics of a project to be considered as part of the EIAR, including:

> *'(f) the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge.'*

23.3 Methodology

The assessment will be a desk top study, with the other assessments being carried out as part of the EIAR to inform the assessment of risk to the environment as a result of accidents or disasters. Documentation will be reviewed, including:

- National Risk Assessment 2017 Overview of Strategic Risks (Department of the Taoiseach 2017);
- Guidance on Assessing and Costing Environmental Liabilities (EPA 2014b);
- A Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage and Local Government (DoEHLG) 2010);
- A Guide to the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (HSA 2015);
- Railway Safety Performance in Ireland (CCR 2017);
- Iarnród Éireann Safety Report 2016 (Iarnród Éireann 2017);
- Flood Risk Management Plan: Liffey & Dublin Bay (OPW 2018a);
- Flood Risk Management Plan: Nanny-Devlin River Basin (OPW 2018b);
- Flood Risk Management Plan: Boyne River Basin (OPW 2018c); and
- A National Risk Assessment for Ireland 2017 (Department of Defence 2017).

It is proposed that the risk assessment will be carried out in three stages:

- Identification and Screening – identify potential unplanned risks that the proposed project may be vulnerable to, and screen them with respect to whether they are already addressed elsewhere (e.g. other EIAR chapters, within the design or covered by legislation), or where the incident cannot be plausibly linked to the proposed project (e.g. volcanic activity).
- Risk Classification – evaluation of each identified risk with regard to the likelihood of occurrence (as per Table 2 of DoEHLG 2010). and the potential impact (as per Table 3 of DoEHLG 2010). As per those tables, the likelihood is ranked from 1 (extremely unlikely) to 5 (very likely), and potential impact is ranked from 1 (minor) to 5 (catastrophic).
- Risk Evaluation – risks will be subject to a risk matrix to determine the level of significance of each risk based on the multiplication of their likelihood and impact rankings, grouped into three categories, high risk (score from 15 to 25), medium risk (score of 8 to 12), and low risk (score of 1 to 6).

Following identification, classification and evaluation of each identified risk; mitigation will be proposed for any occurrences which are categorised as medium or high risk. New scoring for the likelihood and consequence post-mitigation will be assessed in order to give a post- mitigation score.

23.3.1 Study Area

For the purposes of identifying risk of major accidents and disasters the study area includes the extent of the proposed project, as well as any haul routes to and from the proposed project during the construction phase. The assessment will look at the current risk profile with respect to natural disasters, transportation accidents, construction accidents, and security.

Consideration will also be had to sites that have potential for major accident hazard under the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No.209 of 2015).

Ireland does not tend to experience many of the most destructive types of natural disasters that are seen in some other countries. Ireland is volcanically inactive, relatively stable seismically, and does not tend to experience frequent destructive weather events such as hurricanes or tornadoes. The most common type of natural disaster which is experienced in Ireland is flooding. Flood risk assessment for the proposed project will be presented in the EIAR.

With respect to the railway safety baseline for Ireland, the Commission for Railway Regulation (CRR) is responsible for regulating Ireland's railways. According to the CRR's 'Railway Safety Performance in Ireland Report 2020', there were no major accidents or fatalities recorded in 2020 (the last year reported on), except for incidences of apparent self-harm. This was true across all railway types for which the CRR are responsible, namely heavy rail, light rail, public highway interfaces with industrial rail systems, and heritage railways. According to the Railway Safety in the European Union Safety Overview 2017 Report (European Union Agency for Railways 2017), Ireland has reported a zero passenger fatality risk for the whole ten year reporting period from 2010 to 2020.

With respect to current safety trends in the construction sector, the HSA publishes annual statistics in their Summary of Workplace Injury, Illness and Fatality Statistics Report (HSA 2020). The most recent of these was published in 2020 and provides statistics for the period of 2018-2019.

In 2019, the construction sector reported a total of 47 fatalities recorded, representing the second highest sector for fatalities behind agriculture. This is an increase from the record low figure of 39 on 2018. The figure is in line with the five year average (47.6 between 2015-2019).

23.3.2 Surveys

Sufficient information will be obtained from desktop studies and surveys completed for other chapters to inform the assessment.

23.3.3 Consultation

The development of the EIAR will be informed by comprehensive consultation that will be undertaken with statutory consultees (prescribed bodies), other stakeholders and the public. Specific consultation will be undertaken as required with the following bodies:

- Health and Safety Authority (HSA);
- Office of Public Works (OPW);
- Commission for Railway Regulation (CRR); and
- Major Emergency Planning Units for Dublin City, Fingal, Meath and Louth County Councils.

23.4 Receiving Environment

The receiving / baseline environment for the purposes of this assessment will be largely informed by the other chapters, in particular climate, population and human health, socio-economics, biodiversity, traffic and transport, hydrology, hydrogeology and land, soils and geology.

23.5 Potential Impacts

For the purposes of the assessment of risk of major accidents and disasters, the assessment will assume a worst-case scenario.

23.5.1 Construction Impacts

Key risks in undertaking the construction of the proposed project whilst trying to keep the railway line open in the absence of any mitigation measures could include occurrences such as:

- Damage to high voltage lines which cross the proposed project;
- Fire in any works areas during construction;
- Flooding of the line;
- Road traffic collisions involving construction vehicles or as a result of temporary traffic management measures put in place as a result of construction activities, or vehicular collisions within the construction sites; and
- Potential for railway closures due to construction of structures beneath the existing railway line.

Decommissioning is also assessed and is generally similar to, but of less impact than the construction effects.

23.5.2 Operational Impacts

Key risks during operation of the proposed project could include

- Fires within the trains;
- Loss of power to the rolling stock causing operation to halt;
- Train derailment or collision; and
- Security incidents occurring on trains.

24. INTERACTIONS & CUMULATIVE IMPACTS

24.1 Introduction

For each environmental aspect there will be certain interactions or interdependencies with other environmental factors. These interactions will be assessed and a workshop will be held with all of the EIA team in order to fully assess and determine the interactions across each environmental factor. These will be presented in the EIAR.

The EPA (EIA Guidance 2022) define cumulative effects as: 'The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.'

This section will look at the total impact of the proposed project arising from the following:

- Interactions or Secondary effects (i.e. combined effect with another topic); and
- Cumulative effects of other plans and projects.

24.2 Legislation, Policy and Guidance

The interactions and cumulative impact section of the EIAR will be prepared in accordance with:

- Guidelines on Information to be contained in an EIAR (EPA 2022);
- Planning Inspectorate, (2019). Advice Note 17: Cumulative Effects Assessment relevant to nationally significant infrastructure projects; and
- European Union, (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

24.3 Methodology

There will be several elements considered in the assessment of the interactions and cumulative impacts. The main aspect of cumulative effects assessment relates to the assessment of relevant plans and projects, including:

- Cumulative assessment of plans;
- Cumulative assessment of 'active' and granted projects; and
- Cumulative assessment of other known related transport projects that are not active/granted.

The cumulative assessment of relevant key national, regional and local planning policies and the assessment of positive or negative, indirect and secondary impacts as a result of the proposed project will be considered as part of the EIAR.

The cumulative assessment of projects will consider all active and granted planning applications within 300m of the development (red line) boundary (or further where the project is considered to be of a scale that requires assessment) within the past 5 years. The cumulative assessment will include an assessment of planning applications that may result in positive, negative direct or indirect effects with the project. This will include the assessment of related transport projects that are currently being developed in parallel with DART+ (i.e. BusConnects, MetroLink and other projects proposed in the GDA Transport Strategy) which will form part of the dynamic future baseline for the transport assessments in the EIAR.

Cumulative impact assessment will involve the following:

- Identifying where cumulative impacts will potentially occur;
- Identifying the pathway of each impact;
- Determining the magnitude and significance of the impacts;
- Developing mitigation measures to address the impacts; and
- Developing monitoring programmes to measure the impacts and monitor the adequacy of mitigation developed (if required).

The methodology will involve a desktop exercise to identify all other relevant plans and projects in proximity to the proposed project to determine the developments with the potential to cause cumulative effects.

24.3.1 Study Area

The cumulative assessment of projects will consider all active and granted planning applications within 300m of the development (red line) boundary (or further where the project is considered to be of a scale that requires assessment) within the past 5 years.

24.3.2 Consultation

The development of the EIAR will be informed by comprehensive consultation that will be undertaken with statutory consultees (prescribed bodies), other stakeholders and the public. Specific consultation will be undertaken as required with the following bodies:

- Dublin City Council, Fingal County Council, Louth County Council and Meath County Council;
- Waterways Ireland;
- National Transport Authority (NTA);
- Transport Infrastructure Ireland (TII);
- Iarnród Éireann including the Network Enhancement Department; and
- An Bord Pleanála.

Further details of consultation can be found in Section 4 of this report.

24.4 Potential Impacts

Cumulative impacts result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. For example, the European Commission has identified some examples of potential impacts to include:

- Incremental noise from a number of separate developments during construction;
- Combined effect of individual impacts, e.g. noise, dust and visual, from one development on a particular receptor; and
- Several developments with insignificant impacts individually but which together have a cumulative effect.

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