Appendix A1.2
Informal EIA Scoping Report

DART+ West

Project Ireland 2040
Building Ireland's Future

DART+ West

ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

MARCH 2021

ROD
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IDOM

NTA
Údarás Náisiúnta Iompair
National Transport Authority

Iarnród Éireann
Irish Rail

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MAY-MDC-ENV-ROUT-DR-V-0001 P0: Location Plan

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
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Field
EMI	Electromagnetic interference
EMRA	Eastern and Midland Regional Assembly
EPA	Environmental Protection Agency
EPO	Emerging Preferred Option
ERM	East Regional Model
ESB	Electricity supply board
FCC	Fingal County Council

Acronym	Definition
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
IAQM	Institute of Air Quality Management
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
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

Acronym	Definition
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
ROD	Roughan & O'Donovan
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
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+ Programme is seeking to advance a transformative railway package to electrify, modernise and increase the passenger capacity of the existing rail network from the city centre to Maynooth. The existing Dublin to Sligo Railway Line between Maynooth and Dublin Connolly 'DART+ West' (Maynooth Line) will see the electrification of the rail line, re-signalling, closure of the existing six level crossings and construction of replacement alternative structures to maintain access as appropriate, construction of a new train depot west of Maynooth, modifications to the rail line and existing rail overbridge structures and enhancements to stations along its circa 40km length. The project will increase services from the current 7 trains per hour per direction to up to 12 trains per hour per direction by 2027 and support compact sustainable mobility solutions.

Iarnród Éireann (IÉ) is currently assessing and refining the options using multi-criteria analysis (MCA) to determine Emerging Preferred solution for all aspects of the project. This includes aspects associated with level crossings, station enhancements, new depot, permanent way (perway) and over-head electricity lines (OHLE). 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 Statement' 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 but also follows the requirements set out in S.I. 296 of 2018: European Union (Planning and Development) (Environmental Impact assessment) Regulations 2018, 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 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 Informal Scoping Report includes:

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

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

- **Volume 1: Non-Technical Summary**
- **Volume 2A: Environmental Impact Assessment Report (EIAR)**
- **Volume 2B: Environmental Impact Assessment Report (EIAR)**
- **Volume 3: Figures**
- **Volume 4: Photomontages**
- **Volume 5: 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 Informal EIA Scoping Report and would like your views having regard to the following:

- Is the scope and level of detail of the proposed 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 made in writing to IÉ within 6 weeks from the date of this scoping notice. Please send any submissions or observations marked '**DART+ West – EIA Scoping Consultation'** in writing to the address below:

Email: DARTWest@irishrail.ie

Postal Address: Community Liaison Officer
DART+ West
Iarnród Éireann
Inchicore Works
Inchicore Parade
Dublin 8
D08 K6Y3

1. INTRODUCTION

1.1. Introduction

The Environmental Impact Assessment (EIA) screening exercise undertaken has determined that the proposed development 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, a *'statement of the likely effects on the environment'* will be prepared to accompany the application for a Railway Order (RO), this 'statement' is interpreted as an Environmental Impact Assessment Report (EIAR).

This report is the Informal 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 Informal 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:

Chapter 1: Introduction, Project Overview and Project Team.

Chapter 2: Background to the proposed project and the need for the scheme.

Chapter 3: Provides a description of the proposed project.

Chapter 4: Provides an outline of the EIA process and the proposed project methodology to be used

Chapter 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.

Chapter 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.

Chapter 25: Provides a concluding statement for the EIA Scoping Report

1.3. Project Overview

On the Maynooth and M3 Parkway rail lines, DART+ will introduce electrified high-capacity trains at increased frequency for all stations between Maynooth / M3 Parkway and Connolly and Spencer Dock stations in Dublin

city centre (40km corridor). The overall scope of the DART+ West project or hereafter referred to as the 'proposed project' includes the following key infrastructural works:

- Electrification and re-signalling of the Maynooth and M3 Parkway line from City Centre to Maynooth (approximately 40km in length).
- Capacity enhancements at Connolly Station (to include modifications to platforms, junctions & the station) to facilitate increased train numbers.
- Capacity enhancements in the Docklands through the relocation of Docklands station to Spencer Dock, to better serve the Docklands area and to maximise the interchange potential with Luas.
- Closure of existing level crossings on the Maynooth Line and provision of alternative replacement crossings, as required.
- Provision of a new train depot west of Maynooth Station for the maintenance and stabling of trains.
- All civil and bridge works and ancillary works as necessary to accommodate the project.
- And all other temporary works.

The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix A.

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 August 2020. 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 2021. The feedback gathered from the public and ongoing studies will feed into the preparation of the final design, the preparation of the EIAR and the Railway Order application to An Bord Pleanála.

1.5. Project Team

Iarnród Éireann have commissioned IDOM ROD to develop a preliminary design for the proposed project and prepare the Railway Order for the project. The EIAR is being prepared by IDOM and Roughan & O'Donovan (ROD) with inputs from competent experts under a number of disciplines as detailed in Table 1-1.

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Table 1-1 EIA Team

Topic	Specialist Contributors	Company	Qualifications	Experience (Years)
Chapter 1: Introduction	Barry Corrigan	ROD	BSc Hons, DIP, MIEMA, CEnv	20
Chapter 2: Background to the project and Policy Context	Barry Corrigan	ROD	BSc Hons, DIP, MIEMA, CEnv	20
	Frances O'Kelly	ROD	MSc, BSc, MIPI	13
Chapter 3 Project Description	Cristina Chalé Sabat	IDOM	MSc	17
	Tom McKay	IDOM	BEng (Hons), CEng, MIEI	17
	Mark Kilcullen	ROD	BE (Civil), MSc, CEng MIEI, FCons EI	27
	Borja Aróstegui Chapa	IDOM	MSc, PhD Architect	15
Chapter 4: EIA Process and Methodology	Barry Corrigan	ROD	BSc Hons, DIP, MIEMA, CEnv	20
	Frances O'Kelly	ROD	MSc, BSc, MIPI	13
Chapter 5 Alternatives considered	Cristina Chalé Sabat	IDOM	MSc	17
	Mark Kilcullen	ROD	BE (Civil), MSc, CEng MIEI, FCons EI	27
	Borja Aróstegui Chapa	IDOM	MSc, PhD Architect	15
	Barry Corrigan	ROD	BSc Hons, DIP, MIEMA, CEnv	20
Chapter 6 Traffic and Transportation	Marcin Kulinicz	IDOM	MA	10
	Philip Shiels	AECOM	BEng (Hons), CEng MIEI	14
Chapter 7 Population	Frances O'Kelly	ROD	MSc, BSc, MIPI	13
Chapter 8 Human Health	Dr Martin Hogan	Corporate Health Ireland	GP, M.B., Dip, MICGP, MRCGP, MFOM, FFOM, FRCPI, Specialist registration (Irish Medical Council)	30
Chapter 9 Biodiversity	Patrick O'Shea	ROD	BA, MSc	7
Chapter 10 Soils and Geology	Paul Kissane	ROD	BA, BAI, PhD, CEng, MIEI	20
Chapter 11 Hydrology	John Paul Rooney	ROD	BA, CEng MAI	18
	Warren Vokes	ROD	BA, MSc, MCIWEM	5
Chapter 12 Hydrogeology	Brian Dugan	ROD	BSc	15
Chapter 13 Air Quality	Dr. Avril Challoner	AWN	Csci, BSc, MSc, MIAQM MIEnvSc	9
	Dr. Edward Porter	AWN	BSc Hons, PhD	22

Topic	Specialist Contributors	Company	Qualifications	Experience (Years)
Chapter 14 Climate	Dr. Avril Challoner	AWN	Csci, BSc, MSc, MIAQM MIEnvSc	9
	Dr. Edward Porter	AWN	BSc Hons, PhD	22
Chapter 15 Noise and vibration	Dr. Stephen Smyth	AWN	BSc PhD	13
Chapter 16 Landscape and visual	Thomas Burns	Brady Shipman Martin	BAgrSc (Landscape), DIP EIA, Adv Dip Planning and Environmental Law	25
Chapter 17 Material Assets: Agricultural properties	John Bligh	John Bligh & Associates	BA.Ag, MSc MASA MACA	20
Chapter 18 Material Assets: Non-agricultural properties	John Bligh	John Bligh & Associates	BA.Ag, MSc MASA MACA	20
Chapter 19 Material Assets: Utilities	Joe Kelly	ROD	BA, BAI, MSc Civil, CEng MIEI, NISO	25
	Ernesto Picardi	ROD	BSc, MSc	3
Chapter 20 Material Assets: Waste Management	Morgan Hart	ROD	BTech, MIEI	23
Chapter 21 Archaeology and Cultural Heritage	Faith Bailey	IAC	BA, MA, MCIFA	15
Chapter 22 Architectural Heritage	Rob Goodbody	IAC	BA(MOD), DIP Env P, DIPABRC, MUBC, MA	30
Chapter 23 Electromagnetic Compatibility & Stray Current	Nigel Duignan	CEI	MSc	11
	John McAuley	CEI	MSc, BSc	35
Chapter 24 Major Accidents & Disasters	Cristina Chalé Sabat Frances O'Kelly	IDOM ROD	MSc, BSc, MIPI MSc, BSc, MIPI	13 13
Chapter 25 Interactions and cumulative impacts	Frances O'Kelly	ROD	MSc, BSc, MIPI	13
	Barry Corrigan	ROD	BSc Hons, DIP, MIEMA, CEnv	20

2. BACKGROUND TO THE PROJECT/ NEED FOR THE SCHEME

2.1 Introduction

The DART+ Programme (previously referred to as DART Expansion) is a transformative railway project, which will modernise and improve the existing rail network, which radiates from Dublin City Centre. It will provide a sustainable, electrified, faster, reliable and user-friendly rail system, which increases train frequencies and customer carrying capacity.

It will create a full metropolitan area DART network for Dublin, with all the lines linked and connected. This will transform the rail system in the Greater Dublin Area (GDA), delivering new DART services between the City Centre and Drogheda, Maynooth – M3 Parkway and Hazelhatch – Celbridge as shown in Figure 2.1. DART+ will enable an increase in capacity network-wide from the Regions to the GDA.

Customer capacity and train service frequency on these lines will be significantly increased because of the programme. This will help to deliver a more efficient transport system, allowing more people to make sustainable travel choices that reduce their carbon footprint and prevent chronic road congestion helping to meet the goals set out in the state's Climate Action Plan.

The DART+ West project is the first of the infrastructural projects of the DART+ programme and will introduce electrified high-capacity trains at increased frequency for all stations between Maynooth/M3 Parkway to Dublin City Centre (c.40km in length). The new DART+ trains will be similar in configuration and passenger occupancy to the DART trains currently operating on the Malahide/Howth to Bray/Greystones line, with higher passenger carrying capabilities (i.e. each 8-carriage train will have maximum capacity for 1,400 passengers per train). The project will provide the capacity to increase train services from the current 7 trains per hour per direction up to 12 trains per hour per direction by 2027 (subject to demand).

Delivery of the proposed project will support the existing communities along the railway and support future sustainable development. It will serve all existing stations along the railway corridor between Maynooth Station and M3 Parkway Station to Connolly Station and Spencer Dock Station using electrical power that has a lower carbon footprint than the existing trains. The frequency and quality of service that will be provided will provide a viable transport alternative to communities along the route and help encourage people from private car use. This will assist Ireland in reducing greenhouse gas emissions from transport and help combat climate change.

Figure 2-1 DART+ Programme Capacity Improvements

2.2 Project History

The origins of DART+ Programme date back to the 1970's. 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 (2019), the DART Expansion Rail Electrification Assessment (2019), the DART Underground Western Tie-In Study (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 Policy 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. DART West has been recently rebranded from DART Expansion Programme therefore where previous policy documents refer to DART Expansion this should be interpreted as DART+ Programme as they are one in the same.

Table 2-1 Key planning and wider policy context

National Level
Project Ireland 2040 - National Planning Framework – Ireland, Our Plan 2040 and; National Development Plan 2018- 2027
Smarter Travel: A Sustainable Transport Future; 2009-2020
Strategic Investment Framework for Land Transport (SIFLT)
Planning Land Use and Transport Outlook 2040 (PLUTO)
Climate Action Plan 2019
Regional policy Level
Eastern and Midland Regional Spatial and Economic Strategy 2019-2031
Transport Strategy for the Greater Dublin Area 2016-2035
Great Dublin Area Cycle Network Plan
Integrated Implementation Plan 2019-2024
Local Level
Dublin City Development Plan 2016–2022 (under review)
North Lotts and Grand Canal Dock SDZ Planning Scheme 2014
Ashtown-Pelletstown Local Area Plan 2014
Fingal County Development Plan 2017 – 2023
Hansfield Strategic Development Zone Planning Scheme 2006
Barnhill Local Area Plan 2018
Kellystown Local Area Plan 2020
Kildare County Development Plan 2017 – 2023
Maynooth Local Area Plan 2013-2019
Kilcock Local Area Plan 2015-2021
Leixlip Local Area Plan 2020-2023
Meath County Development Plan 2013- 2019
Dunboyne, Clonee & Pace Local Area Plan 2009 - 2015

2.3.1 Project Ireland 2040

Project Ireland 2040 was launched in February 2018 and comprises the National Planning Framework, Our Plan 2040 and the National Development Plan 2018 – 2027. Project 2040 is a long-term overarching strategy which aligns investment decisions with a clearly defined development strategy and ten National Strategic Outcomes (NSO), as shown in **Error! Reference source not found.**.

2.3.1.1 National Planning Framework 2040

The National Planning Framework (NPF) will guide development and exchequer investment up to 2040. It is a blueprint to guide public and private investments to promote and enhance opportunities and infrastructure for an increasing population and sets out the development principles that subsequent plans must follow. The Framework provides each region with a set of objectives and key principles from which detailed plans are to be developed.

As one of the ten National Strategic Outcomes identified within the framework, **NSO 4**: *Sustainable Mobility* is identified as being central to enhancing competitiveness, sustaining economic progress and enabling mobility choices for citizens. This key NSO is supported by the DART+ programme where under NSO 4, the Framework aims to expand the range of public transport services available and to reduce congestion and emissions. Under NSO 4 the policy also *commits to invest in key transport projects such as the DART Expansion, BusConnects and Metro link.*

The DART+ will also support other NSOs identified within the Framework such as **NSO 1**: *Compact Growth* and **NSO 8:** *Transition to a Low Carbon and Climate Resilient Society*.

NSO 1 identifies the need to deliver a greater proportion of residential development within existing built-up areas and the role that an integrated transport network will play in the regeneration and revitalisation of urban areas while NSO 8 includes the electrification of transport fleets as a requirement to support a move away from polluting and carbon intensive propulsion systems.

Figure 2-2 National Strategic Outcomes

The Framework points to an increase in population of one million people from 2016 figures, bringing the total to 5.7 million by 2040; 2.85 million of which will be located within the Eastern and Midlands region. It highlights the impact that this population increase will have on transport along the motorway and railway corridors connecting the region with Dublin, where it is recognised that that the provision of a well-functioning, integrated public transport systems is essential to maintain economic development and enhance competitiveness.

2.3.1.2 National Development Plan 2018 – 2027

Project Ireland 2040's National Development Plan 2018–2027 (NDP) is the most recent infrastructure investment plan adopted by the government. The Plan sets out the investment priorities of the State from 2018 to 2027 within the context of a changing demographic, the need for Ireland to move to a low carbon society, Brexit and the sustainable growth opportunities brought about by a growing population. The Plan supports the delivery of Project Ireland 2040 through public capital investment over the next ten years and guides national, regional and local planning and investment decisions in Ireland over the next two decades. The NDP provides government departments with greater visibility of their investment capacity over the term of the Plan. The Plan caters for an increase in population of over 1 million people by 2040 and identifies €116 billion for investment in capital projects targeted at enhancing regional development and driving economic growth.

The NDP expands on the objectives of NSO 4, Sustainable Mobility and outlines how increases in passenger demand are to be catered for by a sustainable public transport system significantly less reliant on vehicles. As shown in Table 2-2 the DART+, along with BusConnects and Metrolink is included in the NDP 2018-27 (under NSO 4) as a major national infrastructure project for appraisal and delivery and has been allocated €2 billion Exchequer funding for the development and delivery of the programme.

The NDP outlines the scope of the DART+ Programme to include investment in new rolling stock, new infrastructure and the electrification of the Sligo line to Maynooth and M3 parkway, the Northern line to Drogheda and the Kildare line to Celbridge/Hazelhatch to create a full metropolitan area DART network with all lines linked and connected as shown in Figure 2-3.

The Plan does not make provisions for any new tunnelling but does include the utilisation of the existing Phoenix Park tunnel and requires that the route for any future DART Underground is protected to allow for its future delivery. The indicative resource allocation for delivery of each NSO over the period 2018-2027 is shown in Table 2-2 below.

Table 2-2 Indicative resource allocations for the delivery of NSOs, and for named Strategic Investment Priorities under each NSO, over the period 2018-2027

National Strategic Outcome		Allocation (€ Billion)
1	Compact Growth	14.5
2	Enhanced Regional Accessibility	7.3
3	Strengthened Rural Economies and Communities	8.8
4	Sustainable Mobility, of which:	8.6
	DART Expansion	*2*
	Metro Link	*3*
	BusConnects Programme (Dublin, Cork and Galway)	*2.4*
	Other	*1.2*
5	A Strong Economy, supported by Enterprise, Innovation and Skills	9.4
6	High-Quality International Connectivity	4.8
7	Enhanced Amenity and Heritage	1.4
8	Transition to a Low-Carbon and Climate-Resilient Society	21.8
9	Sustainable Management of Water and other Environmental Resources	8.8

National Strategic Outcome		Allocation (€ Billion)
10	Access to Quality Childcare, Education and Health Services	20.1
11	Other sectors	3.0
12	Contingency	7.4
	Total	**116**

Figure 2-3 NDP Public Transport Network (including DART+)

2.3.2 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.
- Increase commuting by alternative sustainable modes to 55% by 2020.

The document outlines five **key** goals necessary for achieving sustainability in transport. These are:

- Reduce overall travel demand and commuting distances travelled by car.
- Improve economic competitiveness through maximising the efficiency of the transport network and alleviating congestion and infrastructure bottlenecks.
- Reduce reliance on fossil fuels and thus improve security of energy supply.
- Minimise the negative impacts of transport on the local and global environment by reducing air pollutants and Greenhouse Gas emissions attributed to travel.

The DART+ Programme (and DART+ West) is aligned to the policy and supports the key goals necessary for achieving sustainability in transport.

2.3.3 Strategic Investment Framework for Land Transport (SIFLT)

The Department of Transport, Tourism and Sport's (DTTAS) Strategic Investment Framework for Land Transport (2015) lays out the role of transport in the future development of the Irish economy. It estimates the appropriate level of investment in the land transport system and sets out the priorities for the allocation of investment to best develop Irelands land transport network. The Framework considers the objective of transport investment considering current and projected transport demand and spells out the key issues for policy makers when investing in land transport.

The Framework identifies the rationale for investment in transport networks, citing their role in driving economic growth, and supporting the delivery of economic development objectives by enabling efficiency and competitiveness across our economy. The framework highlights Irelands obligations regarding the reduction of carbon emissions and identifies the need for radical transformation within the transport sector if the targeted reduction in carbon emissions of 80% by 2050 is to be achieved. The need for investment now is also established by illustrating that the existing land transport systems cannot cater for the projected increases in population and a 35% increase in commuting trips by 2040.

The Framework's priorities outlined below echo the Project Ireland 2040 National Strategic Outcomes (NSOs) and guide investment decisions for transport schemes:

Address Urban Congestion: *The need to address urban congestion is prioritised within the Framework to improve the efficiency and sustainability of the urban transport system. This is to be achieved by improving and expanding public transport capacity, the expansion of walking and cycling infrastructure and the wider use of technology within transport systems; and*

Maximise the contribution of Land Transport to National Development: *Transport systems should aim to enhance the efficiency of the existing network, improve connections to key ports and airports and support national and regional spatial planning priorities.*

The DART+ Programme's objectives are aligned with these SIFLT priorities.

2.3.4 Planning Land Use and Transport Outlook 2040 (PLUTO)

Following the publication of Project Ireland 2040, DTTAS commenced the PLUTO 2040 initiative to update the SIFLT to ensure the alignment of planning with regard to land use and transport projects across government departments and agencies. PLUTO has since been retitled as the National Investment Framework for Transport in Ireland. Several priorities have been identified to be incorporated into the planning framework going forward. Within the framework there is continued focus on the need to address climate change through the delivery of reduced emissions for transport networks supported by technological initiatives. The framework has established priorities for transport projects up to 2040 which include:

A land transport network which delivers a high level of service for the population of Ireland:

- Enabling the delivery of the National Planning Framework (NPF) objectives regarding where people live and work.
- Maximising the sector's contribution to Ireland's economic competitiveness.
- Realising a low carbon sustainable transport system.

The National Investment Framework for Transport in Ireland is still in progress and it is envisaged that the framework will proceed to public consultation at the end of March 2021. The DART+ West aligns with and supports the above priorities.

2.3.5 Climate Action Plan 2019

The Climate Action Plan published by the Department of Communications, Climate Action and Environment in 2019 includes measures to guide Ireland towards achieving the European Union's net zero greenhouse gas (GHG) emissions target by 2050. These measures are detailed in the roadmaps developed for each public sector with an objective to deliver a cumulative reduction in GHG emissions over the 2021 to 2030 period.

In relation to the Transport sector, the Plan identifies that electrification of transport, namely of private vehicles, bus and rail services is the most cost-effective approach in reducing the sector's GHG emissions. Concerning the rail network, this is reflected in the following Actions:

Action Number 92 *"Commence the transition to hybrid trains to allow extended electrification of rail services"*

Action Number 93 *"Extend the Dublin area railway electrification for the Maynooth Line (to Maynooth), Kildare Line (to Celbridge), and Northern Line (to Drogheda)"*

DART+ Programme aligns with and supports the Climate Action Plan.

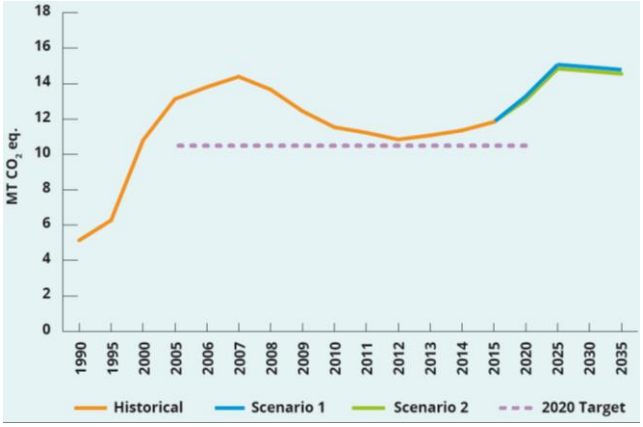

Figure 2-4 Projections of Greenhouse Gas Emissions from the Transport Sector[1]

2.3.6 Eastern and Midland Regional Spatial and Economic Strategy 2019 - 2031

The Eastern and Midland Regional Assembly's (EMRA) 2019 Regional Spatial and Economic Strategy (RSES) provides regional specific policy objectives for the Midlands, Eastern and Dublin regions. The Strategy will replace the existing Regional Planning Guidelines (RPGs) with additional functions requiring an economic strategy to be combined with the spatial strategy.

The RSES addresses the implementation of Project Ireland 2040 at the regional level. It considers spatial and economic factors which relate to the future of the region and ensures that employment opportunities, services, ease of travel and the overall wellbeing of citizens is being addressed. The Strategy highlights the DART+ and its role in the consolidation of Dublin City and the regeneration of locations such as Dublin Docklands and Poolbeg. Along the North-West corridor, the DART+ to Maynooth will enhance rail services on the Dublin – Sligo line. The RSES also emphasises the role of DART+ Programme in increasing capacity to support the ongoing development of lands adjacent to the line at Leixlip and Maynooth.

Eastern and Midlands Regional Spatial & Economic Strategy (RSES) supports the project through Regional Policy Objective **RPO 8.8** "*The RSES supports delivery of the rail projects set out in Table 8.2, subject to the outcome of appropriate environmental assessment and the planning process*". The DART+ Programme is listed as one of the rail projects in Table 8.2 *"DART Expansion Programme - new infrastructure and electrification of existing lines, including provision of electrified services to Drogheda or further north on the Northern Line, Celbridge-Hazelhatch or further south on the Kildare Line, Maynooth and M3 Parkway on the Maynooth/ Sligo Line, while continuing to provide DART services on the South-Eastern Line as far south as Greystones"*.

The Strategy highlights the importance of provision of enabling infrastructure for growth in Maynooth, identifying that the *"DART Expansion project and proposed electrification of the rail line to Maynooth represents a significant opportunity for sequential growth in Maynooth"*.

2.3.6.1 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** which includes the following:

"To focus growth along existing and proposed high quality public transport corridors and nodes on the expanding public transport network and to support the delivery and integration of 'BusConnects', DART expansion and LUAS extension programmes, and Metro Link, while maintaining the capacity and safety of strategic transport networks".

The MASP contains a number of objectives for the Dublin Metropolitan Area, including Sustainable Transport Objective to include:

RPO 5.2 *Support the delivery of key sustainable transport projects including Metrolink, DART and LUAS expansion programmes, BusConnects and the Greater Dublin Metropolitan Cycle Network and ensure that future development maximises the efficiency and protects the strategic capacity of the metropolitan area transport network, existing and planned*. The priorities of the Eastern and Midland RSES align with and support the DART+ Programme.

[1] Source, EPA

2.3.7 Transport Strategy for the Greater Dublin Area 2016 – 2035

This document published by the National Transport Authority (NTA) lays out the transport strategy for the Greater Dublin Area (GDA) up to 2035. The Strategy which was adopted by Government and is now Government Policy is modally balanced and designed to cater for the future needs of the Greater Dublin Area and enable people to move efficiently around the Dublin region. It integrates short, medium and long-term plans for rail, bus, cycling, walking and roads as shown in **Error! Reference source not found.**5. It sets out the transport provisions necessary to '*contribute to the economic, social and cultural progress of the GDA by providing for the efficient, effective and sustainable movement of people and goods*.'

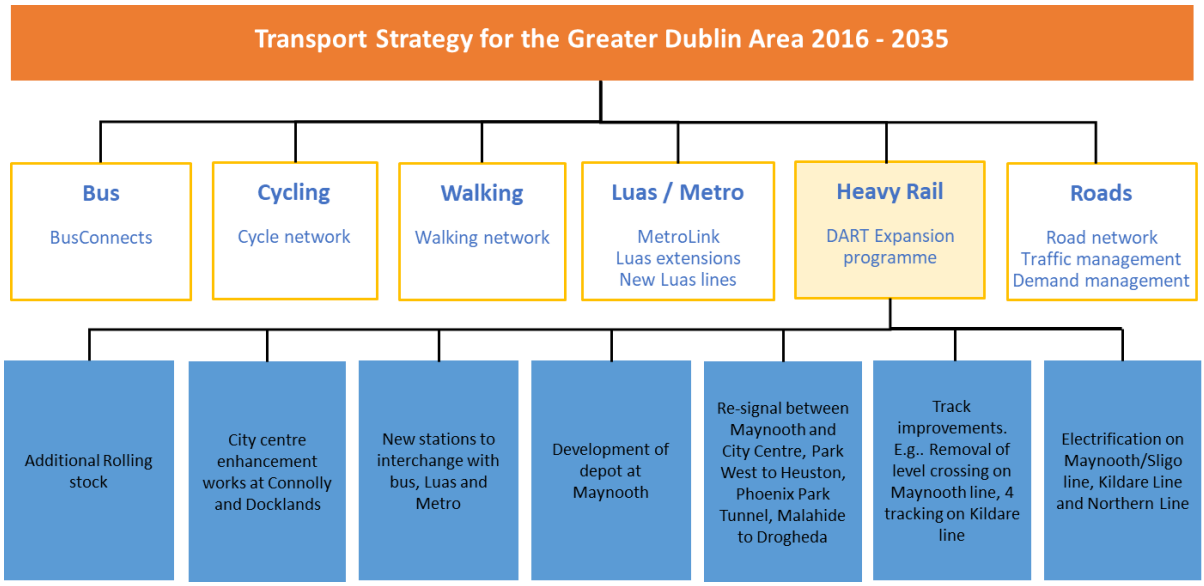

Figure 2-5 NTA Multi modal Transport Strategy for GDA

In developing the Strategy, the NTA have considered alternative options for the provision of transport services along the six radial corridors into Dublin and found heavy rail to be the most appropriate solution to meet the transport needs of the high-density population centres across several of the corridors identified. Consequently, with regards to Heavy Rail Infrastructure the Strategy intends to:

- *"Implement the DART Expansion Programme, which will provide DART services as far north as Drogheda; to Hazelhatch on the Kildare Line (including a tunnel connection from the Kildare Line to link with the Northern / South-Eastern Line); to Maynooth in the west and to the M3 Parkway*
- *Develop a new train control centre to manage the operation of the rail network.*
- *Construct additional train stations in developing areas with sufficient demand.*
- *Implement a programme of station upgrades and enhancement; and*
- *Ensure an appropriate level of train fleet, of an appropriate standard, to operate on the rail network"*

The Strategy also outlines its objectives for Transport Services and Integration, including bus and rail services. In relation to the rail service, the Strategy proposes the following:

"The DART services will operate to a high frequency with adequate capacity to cater for the passenger demand. It is anticipated that DART services in the city centre section of the network will operate to a regular ten minute service frequency in the peak hours from 2016 and will transition to a five minute service frequency following the completion of the DART Expansion Programme".

The objectives of the Transport Strategy for the GDA align with and support the DART+ Programme

The GDA Transport strategy includes objectives in respect of specific modes of transport. A selection of pertinent objectives is included below:

- *5.7 Walking: Provide a safer, more comfortable and more convenient walking environment for those with mobility, visual and hearing impairments, and for those using buggies and prams;*
- *5.7 Walking: Revise road junction layouts, where appropriate, to provide dedicated pedestrian crossings, reduce pedestrian crossing distances, provide more direct pedestrian routes, and reduce the speed of turning traffic*
- *5.7 Walking: Ensure that permeability and accessibility of public transport stops and stations for local communities is maintained and enhanced;*
- *5.8.2 Regional and Local Roads: Enhance orbital movement, outside of the M50 C-Ring, between the N3, the N4 and N7 national roads, by the widening of existing roads and the development of new road links;*
- *5.8.2 Regional and Local Roads: Develop appropriate road links to service development areas;*
- *5.8.2 Regional and Local Roads: Enhance pedestrian and cycle safety through the provision of safer road junctions, improved pedestrian crossing facilities and the incorporation of appropriate cycle measures including signalised crossings where necessary.*
- *5.8.3 Principals of Road Development: There will be no significant increase in road capacity for private vehicles on radial roads inside the M50 motorway;*
- *5.8.3 Principals of Road Development: That the road scheme, other than a motorway or an express road proposal, will be designed to provide safe and appropriate arrangements to facilitate walking, cycling and public transport provision.*

2.3.8 Greater Dublin Area Cycle Network Plan

The Greater Dublin Area Cycle Network Plan sets out a 10-year strategy to expand the urban cycle network from 500km to 2,480km. The overarching ambition of the scheme is, by 2021, to increase the numbers who commute by bike to be the same amount as those who commute by bus.

The network will consist of a series of primary, secondary and feeder routes as well as greenways routes. These routes will comprise of a mix of cycle tracks and lanes, cycleways and infrastructure-free cycle routes in low traffic environments. To compliment the investment in the cycle network, the cycle network plans also provide for:

- *Sufficient on and off street public cycle parking at key urban destinations such as bus/rail stations, schools and large workplaces.*
- *The expansion of the bike share scheme in Dublin City and the introduction of similar schemes across the Greater Dublin Area.*
- *The implementation of a comprehensive cycle route signage programme in conjunction with the development of the cycle network.*

The proposed network of primary, secondary and greenway routes that will help support cycling in the vicinity of the study area is shown on the **Error! Reference source not found.** 6.

The Plan includes the development of the Royal Canal Greenway route. The Sligo line is immediately parallel to the Royal Canal extending from Dublin city centre to Maynooth. The canal towpath is paved from North Strand Road as far as Ashtown, with a good quality gravel surface from there to Blanchardstown. This path is in use by cyclists as a defacto cycleway at present. A number of design studies are underway to develop a high-quality cycle track along the canal westward to Maynooth, as the Royal Canal Urban Greenway emerging preferred route which is at Public Consultation stage at the moment.

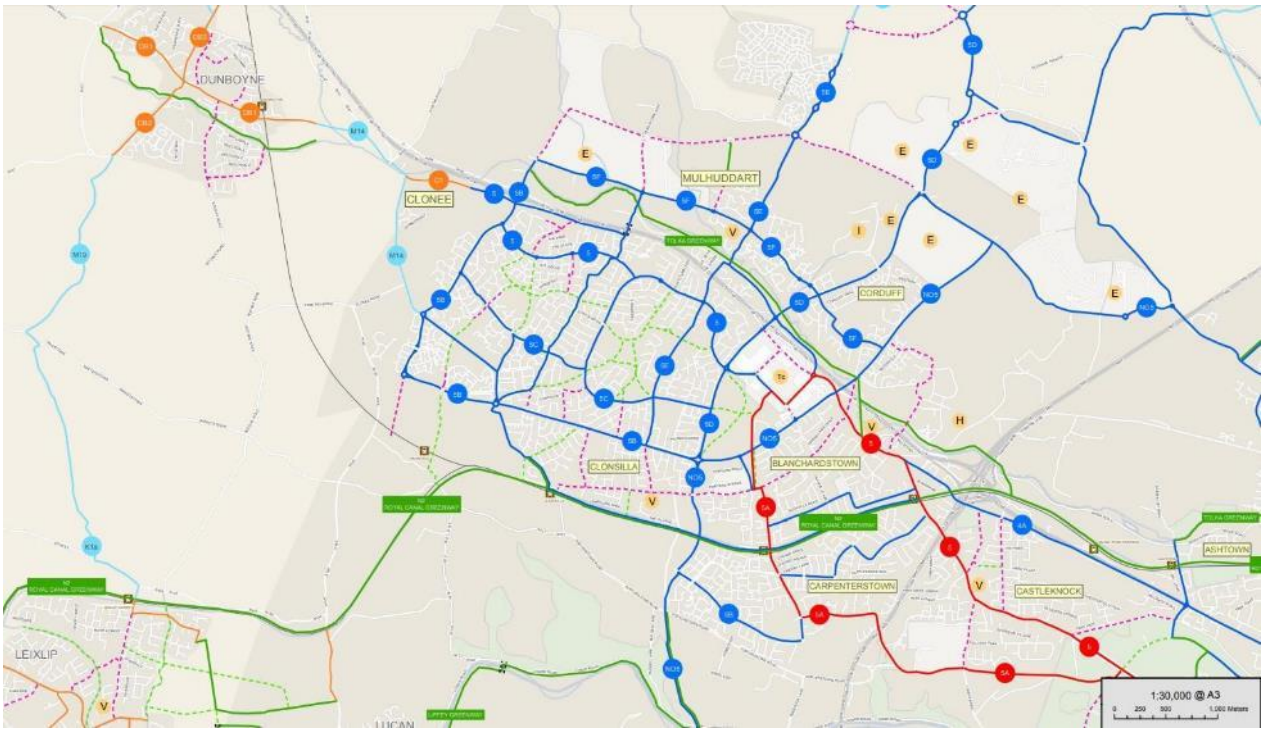

Figure 2-6 Greater Dublin Area Cycle Network Plan

2.3.9 Integrated Implementation Plan 2019-2024

The NTA's Integrated Implementation Plan 2019-2024 (currently in draft) 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.

The Plan provides further detail on the sequencing and allocation of the €4.6b available to the NTA across Bus, Light Rail, Metro and Heavy Rail projects up to 2024. Table 2-3 shows the expenditure profile for heavy rail projects which includes the DART+ Programme and other heavy rail projects such as City Centre Re-signalling, the National Train Control Centre and fleet and other network developments.

Table 2-3 Expenditure Profile for Heavy Rail Projects

	2019	2020	2021	2022	2023	2024	Total
Heavy Rail investment (€m)	**67.7**	**108.0**	**167.0**	**166.0**	**225.8**	**315.0**	**1,049.5**

2.3.10 Local Planning Policy

The local authorities of Dublin City Council, Fingal County Council, Kildare 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 development 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 supported the proposed project in the respective Development Plans are outlined below.

2.3.10.1 Dublin City Development Plan 2016-2022

The Dublin City Development Plan provides an integrated, coherent spatial framework to ensure Dublin city is developed in an inclusive way which improves the quality of life for its citizens, while also being a more attractive place to visit and work. The Dublin CDP remit includes the areas between the Docklands and Ashtown Level Crossing.

The main policies and objectives stated in the Development Plan which are of specific relevance to the DART+ Programme:

Policy MT1*: To support the sustainability principles set out in The National Transport Authority's Transport Strategy for the Greater Dublin Area*

Policy MT4: *To promote and facilitate the provision of Metro, all heavy elements of the DART Expansion Programme including DART Underground (rail interconnector), the electrification of existing lines, the expansion of Luas, and improvements to the bus network in order to achieve strategic transport objectives*.

Policy MT3: *To support and facilitate the development of an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city in association with relevant transport providers, agencies and stakeholders.*

Policy MTO5(i): *To facilitate and support measures proposed by transport agencies to enhance capacity on existing public transport lines and services, to provide/improve interchange facilities and provide new infrastructure.*

Policy MT6 *(i): To work with Iarnród Eireann, the NTA, Transport Infrastructure Ireland (TII) and other operators to progress a coordinated approach to improving the rail network, integrated with other public transport modes to ensure maximum public benefit and promoting sustainable transport and improved connectivity.*

The current Dublin City Development Plan is currently under review a central policy tenant in the forthcoming plan will be Transit Oriented Development (TOD) for which DART+ West supports.

North Lotts and Grand Canal Dock SDZ 2014

Dublin City Council successfully prepared and adopted a SDZ Scheme for the Docklands area of North Lotts and Grand Canal Dock in 2014. The Docklands Station is located with the SDZ. The main objectives within the North Lotts and Grand Dock SDZ that support the DART+ programme include:

MV1*: To continue to promote the modal shift from private car use towards increased use of more sustainable forms of transport such as cycling, walking and public transport and to implement the initiatives contained in the Government's 'Smarter Travel, A Sustainable Transport Future 2009-2020'*

MV2*: To support and facilitate the development of an integrated public transport network with efficient interchange between transport nodes, to serve the existing and future needs of all ages in association with relevant transport providers, agencies and stakeholders and to facilitate the integration of walking and cycling with public transport.*

Section 4.4.4.1 of the North Lotts and Grand Dock SDZ states, '*works for the provision of new public transport, or in the furtherance of existing or permitted public transport, shall be considered on their merits, in accordance with the policies and objectives of the Dublin City Development Plan*'

Ashtown-Pelletstown Local Area Plan (January 2014)

The Ashtown - Pelletstown Local Area Plan (LAP) relates to the lands positioned south of the River Tolka and North of the Royal Canal within the administrative boundary of Dublin City Council. The lands of the LAP are immediately north of the existing Ashtown level crossing and train station.

The vision for Ashtown-Pelletstown LAP area is "*The creation of a sustainable living and working environment with a strong urban identity, anchored by mixed-use supporting hubs and benefitting from both good permeability and quality public transport options. The area shall be characterised by a vibrant social mix, reflected in a variety of housing options and community facilities/amenities, well integrated with the wider city via improved infrastructure and green infrastructure*".

The LAP Objectives that support to this study:

MA1: *To improve accessibility throughout the plan area, facilitate the completion of hierarchical road infrastructure network, and encourage links to existing and proposed public transport nodes both within and beyond the LAP boundary.*

MA3: *To promote increased cycling and pedestrian activity through the development of a network of routes that connect to public transport routes, centres of employment, amenities and community and retail destinations.*

MAO7: *To encourage and facilitate, in cooperation with Fingal County Council and Iarnród Éireann, the replacement of the existing manually operated rail level crossing at Ashtown Road, with suitably designed alternative. The eventual design shall have regard to both existing and proposed developments in the immediate vicinity of the plan area and provide for high quality pedestrian and cycle facilities linking with existing and proposed pedestrian cycle networks both within and surrounding the LAP area*.

2.3.10.2 Fingal County Development Plan 2017-2023

The Fingal Development Plan (FDP) 2017-2023 policy remit in the context of this project includes the areas from the Ashtown level crossing west to Leixlip. The delivery of DART+ is recognised as a strategic aim of the Plan.

Strategic Aim 15: *Seek the development of a high quality public transport system throughout the County and linking to adjoining counties, including the development of the indicative route for New Metro North and Light Rail Corridor, improvements to railway infrastructure including the DART Expansion Programme, Quality Bus Corridors (QBCs) and Bus Rapid Transit (BRT) systems, together with enhanced facilities for walking and cycling*

Improving transport within Fingal is recognised as key to the future economic, social and physical development of Fingal. The Fingal Development Plan supports the project through the following objectives:

MT01: *Support National and Regional transport policies as they apply to Fingal. In particular, the Council supports the Government's commitment to the proposed new Metro North and DART expansion included in Building on Recovery: Infrastructure and Capital Investment 2016-2021. The Council also supports the implementation of sustainable transport solutions.*

MT30: *Support Iarnród Éireann and the NTA in implementing the DART+ Programme, including the extension of the DART line to Balbriggan, the design and planning for the expansion of DART services to Maynooth and the redesign of the DART Underground*.

MT31: *Design and implement measures, having regard to potential environmental impacts, to mitigate the increased congestion on the local road network caused by more frequent closures of the existing level crossings on the Maynooth Line. Ensure that well in advance of any such measures being taken, extensive direct consultation is undertaken with local communities and residents who would be directly impacted by such measures.*

MT28: *Facilitate, encourage and promote high quality interchange facilities at public transport nodes throughout the county.*

The land use zoning objectives for the Ashtown, Coolmine, Porterstown Clonsilla and Barberstown level crossings are set down on Sheet 13, Blanchardstown

Relevant aims of the Plan relating to transport are as follows:

- *Incorporating sustainable development, climate change mitigation and adaptation, social inclusion, high quality design and resilience are fundamental principles that underpin the Development Plan. Relevant aims also include:*
- *To promote an appropriate balance of development across the County, by developing a hierarchy of high quality, vibrant urban centres and clearly delineated areas of growth, and favouring expansion in areas nearest to existing or planned public transport nodes.*
- *To promote and facilitate movement to, from, and within the County of Fingal, by integrating land use with a high quality, sustainable transport system that prioritises walking, cycling and public transport.*
- *To provide an appropriate level of safe road infrastructure and traffic management, in particular to support commercial and industrial activity and new development.*
- *To work with all relevant stakeholders to seek a reduction in greenhouse gas emissions from transport.*

Hansfield Strategic Development Zone Planning Scheme 2006

The Hansfield Strategic Development Zone (SDZ) Planning Scheme comprises approximately 80.74 hectares of land in south West Blanchardstown close to the county boundary with County Meath.

The SDZ Planning Scheme was approved by An Bord Pleanála in April 2006 and a number of residential units are occupied. The site is currently active with residential units under construction namely in Zones 1, 2, 4 & 6.

The Transport Strategy for the SDZ included the opening of the old Navan Line. The first phase of the proposed railway linking Navan to Dublin opened in September 2010. Over 25 trains each way per day now run between the new M3 Parkway Station, Dunboyne and Dublin city centre. Part of the strategic infrastructure within the SDZ was to provide a new train station within the SDZ lands, and Hansfield train station was opened in 2013.

In addition, pedestrian/cyclist connection to Clonsilla Train Station will be provided as part of the SDZ strategy. Figure 2-7 illustrates the extent of the SDZ lands. The Hansfield SDZ lands are adjacent to the Barnhill LAP area.

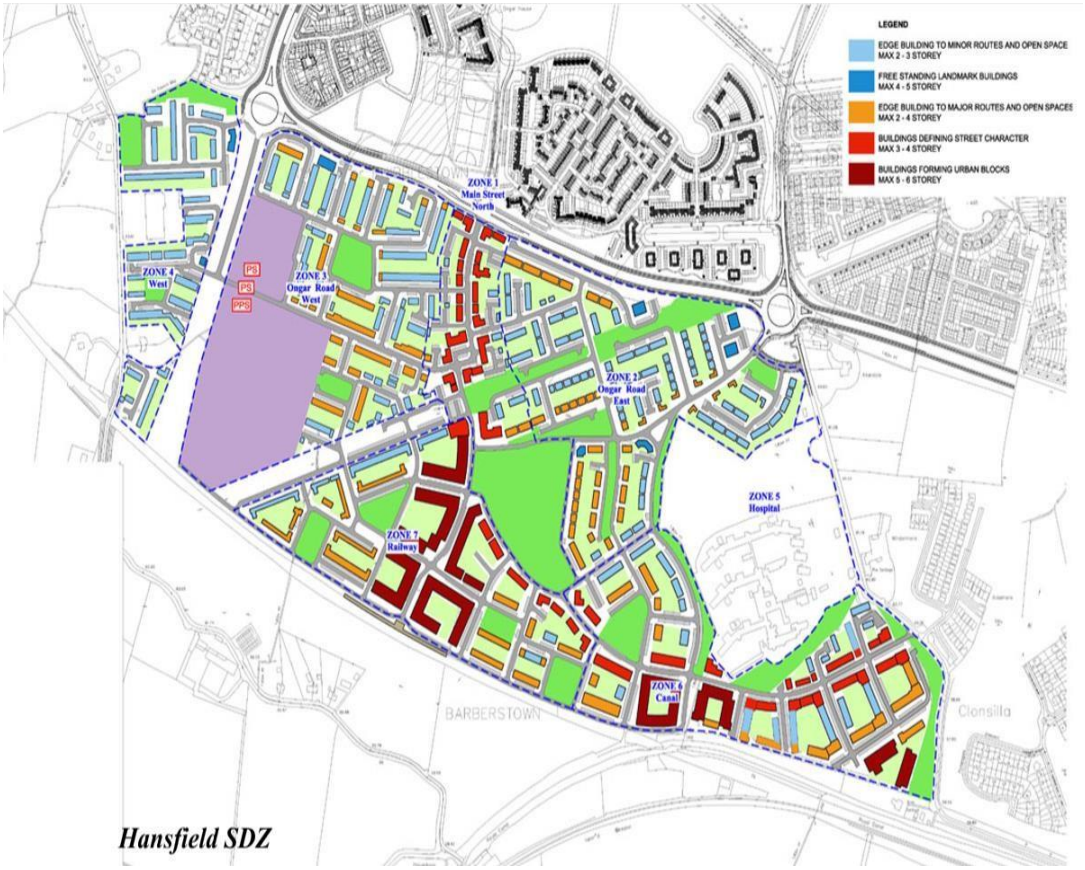

Figure 2-7 Hansfield Strategic Development Zone Boundary Area

Barnhill Local Area Plan 2018

The Barnhill LAP comprises 45.64 hectares of greenfield lands, illustrated in **Figure 2-8**. The designated area is located approximately 3km from Blanchardstown Town Centre, situated directly south of the Dunboyne to Clonsilla rail Line, west of the Royal Canal and the Dublin - Maynooth Railway Line, and east of the R149.

The Vision for Barnhill is to create a place to live that is appealing, distinctive and sustainable, maximising the opportunities provided by the surrounding natural environment for biodiversity and improved amenities. It is envisaged that Barnhill will develop as a sustainable community comprised of new homes, community, leisure and educational facilities based around an identifiable and accessible new local centre which will form the heart of the area.

Key aims of the LAP Movement and Transport Strategy are:

- *Improve accessibility and maximise public transport use, taking account of the land's location adjoining Hansfield train station.*
- *Encourage use of sustainable transport options. Walking and cycling shall be encouraged, particularly for shorter trips.*
- *Prioritise planned infrastructure that supports public transport, and ensures the land use strategy is informed by, and integrated with transportation objectives.*
- *Seek the interconnection of walking and cycling routes with key public transport and amenity destinations (both existing and planned).*
- *Encourage sustainable densities of population, such that public transport is supported and sustained, and walking and cycle routes are kept active.*

In order to provide for a coherent sustainable movement and transport strategy, and to maximise development capacity within the LAP lands, it is required to deliver the necessary extension of the Ongar-Barnhill road with provision of a new bridge over the Dunboyne (Pace) – Clonsilla rail line and provision of a new junction with the existing road network. This will connect the Ongar road to the existing Clonee-Lucan road (R149).

Figure 2-8 Barnhill LAP Movement Network

Kellystown Local Area Plan 2020

The Kellystown LAP was approved by Fingal County Council in January 2021. The Kellystown lands, outlined in **Error! Reference source not found.**9, are situated directly south of the Royal Canal and the Dublin-Maynooth Railway Line, and between Diswellstown Road to the east and Clonsilla Road (R121) to the west.

The LAP lands extend to circa. 56.4 ha (0.4 ha occupied by roads) and will provide a statutory framework for the proper planning and sustainable development of the area.

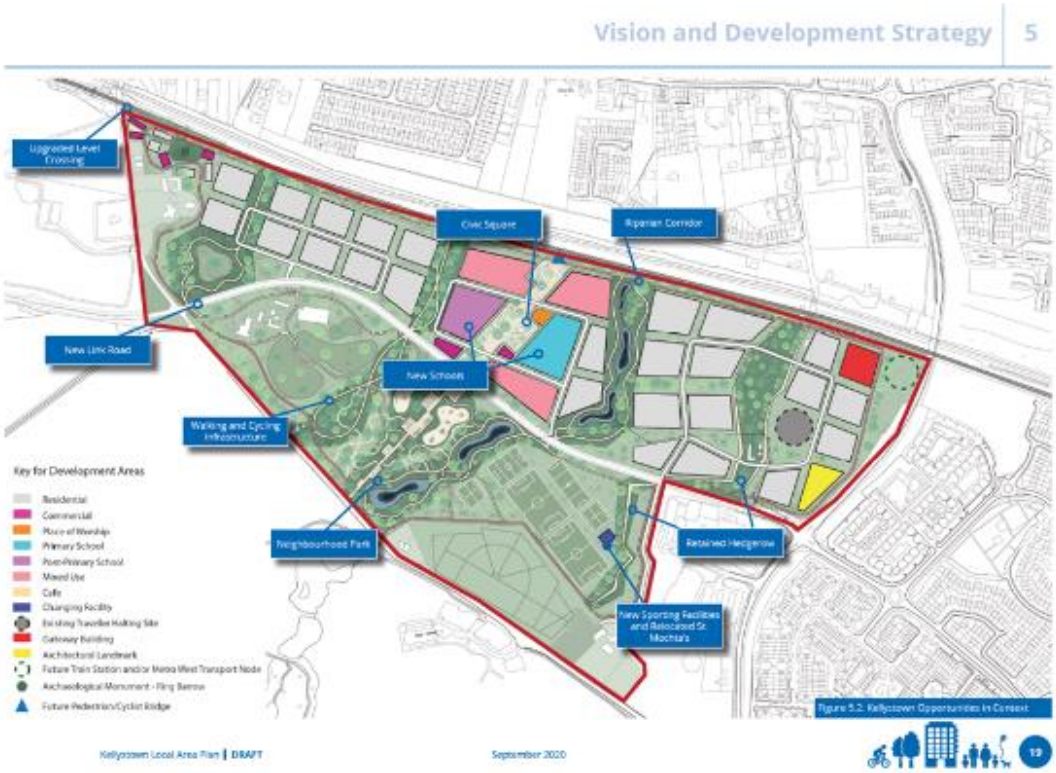

Figure 2-9 Kellystown LAP Vision and Development Strategy (Source: Draft Kellystown LAP 2020)

The LAP refers to the DART+ West proposals and recognises the intention to close Clonsilla and Porterstown level crossings. The LAP supports public transport and increased levels of pedestrian and cyclist movement within and around the area which DART+ West would facilitate.

The following local objectives from the Fingal Development Plan 2017-2023 are also applicable to the LAP lands:

Relevant to the Clonsilla level crossing is Local Objective 130: *Prepare a feasibility study on the location of a road bridge, crossing the Royal Canal and the Dublin/Maynooth railway, connecting north to the Ongar road. This location shall be determined in advance of, or as part of the adoption of the Local Area Plan for lands at Kellystown.*

The Chief Executive Report[2] makes the following recommendation for the Final LAP:-

To fulfil the requirement of Objective 130, the Planning Authority as part of an examination of proposals for Kellystown Road, has undertaken a two-stage options assessment to determine the preferred route. This included the preparation of a Stage 1 Route Options phase which identified a do- nothing option together with nine alternative route options. The emerging preferred route- Option 3 providing for a crossing of the Royal Canal and the Dublin Maynooth Rail line at Barberstown provides the optimum location for the required road bridge and an appropriate link with approved strategic road infrastructure - Barnhill Ongar road which will serve the developing areas of Barnhill and Hansfield SDZ as well as the wider hinterland.

[2] Chief Executive's Report, Draft Kellystown Local Area Plan, Fingal County Council (**https://consult.fingal.ie/en/consultation/draft-local-area-plan-kellystown-dublin-15**)

Local Objective 137: *Preserve the existing pedestrian and vehicular right of way at the level crossing at Porterstown. The CE Report states that "it should be noted that transport and movement strategy of the LAP is not predicated on the closure of this crossing to vehicular traffic."*

Local Objective 144: *Protect the rural character and setting of the Luttrellstown Road and enhance its use for pedestrians and cyclists.*

2.3.10.3 Kildare County Development Plan 2017-2023

The Kildare County Development Plan (KCDP) sets out an overall strategy for the proper planning and sustainable development of the functional area of County Kildare, over the period 2017-2023 and beyond. In the context of the DART+ project the KCDP includes the areas from Leixlip extending west to the proposed depot west of Maynooth.

The main policies and objectives stated in the County Development Plan which are of specific relevance to the DART+ Programme include:

PT 1: *Promote the sustainable development of the county by supporting and guiding national agencies including the National Transport Authority in delivering major improvements to the public transport network and to encourage public transport providers to provide an attractive and convenient alternative to the car.*

PT 2: *Generate additional demand for public transport services by strengthening development around existing and planned high capacity transport routes and interchanges throughout the county.*

PTO 3*: Support the delivery of the NTAs Greater Dublin Area Transport Strategy (2016-2035) in Kildare.*

PTO 5*: Investigate, in co-operation with Irish Rail and the National Transport Authority, the provision of new railway stations in the county and the upgrading/relocation of existing stations, to rectify existing constraints in the network.*

PTO 7*: Promote and support the upgrading of, the Maynooth rail line and the Kildare rail line, in accordance with the Transport Strategy for the Greater Dublin Area 2016-2035 and in co-operation with the NTA.*

Kilcock Local Area Plan 2015-2021

The Kilcock Local Area Plan development boundary is located out of the development boundary immediately west of the proposed Depot location. The main policy and objectives stated in the LAP which would be are applicable to the DART+ Programme include:

- ***MT1:*** *To support the sustainability principles set out in the National Spatial Strategy, The Regional Planning Guidelines for the Greater Dublin Area, Government's 'Smarter Travel, A Sustainable Transport Future 2009-2020' and the National Transport Authority's 'A Platform for Change', the Integrated Implementation Plan for Transport in the GDA and the Authorities Draft Transportation Strategy for the Greater Dublin Area (2011-2030) and to ensure that land use and zoning are fully integrated with the provision and development of a comprehensive, sustainable and efficient transportation network that accommodates the movement needs of Kilcock and the region.*
- ***MTO2:*** *To maximise the use of public transport infrastructure, walking and cycling and minimise car dependence.*

Leixlip Local Area Plan 2020-2023

The existing Blakestown level crossing is located within the Leixlip LAP.

The LAP supports the proposed DART+ programme through objective ***MT2.2*** *To support and facilitate the delivery of electrification and upgrading of the Dublin – Sligo rail line from Connolly Station to Maynooth,*

including improvements to Cope Bridge" and recognises the requirement for the removal of level crossings and re-signalling works.

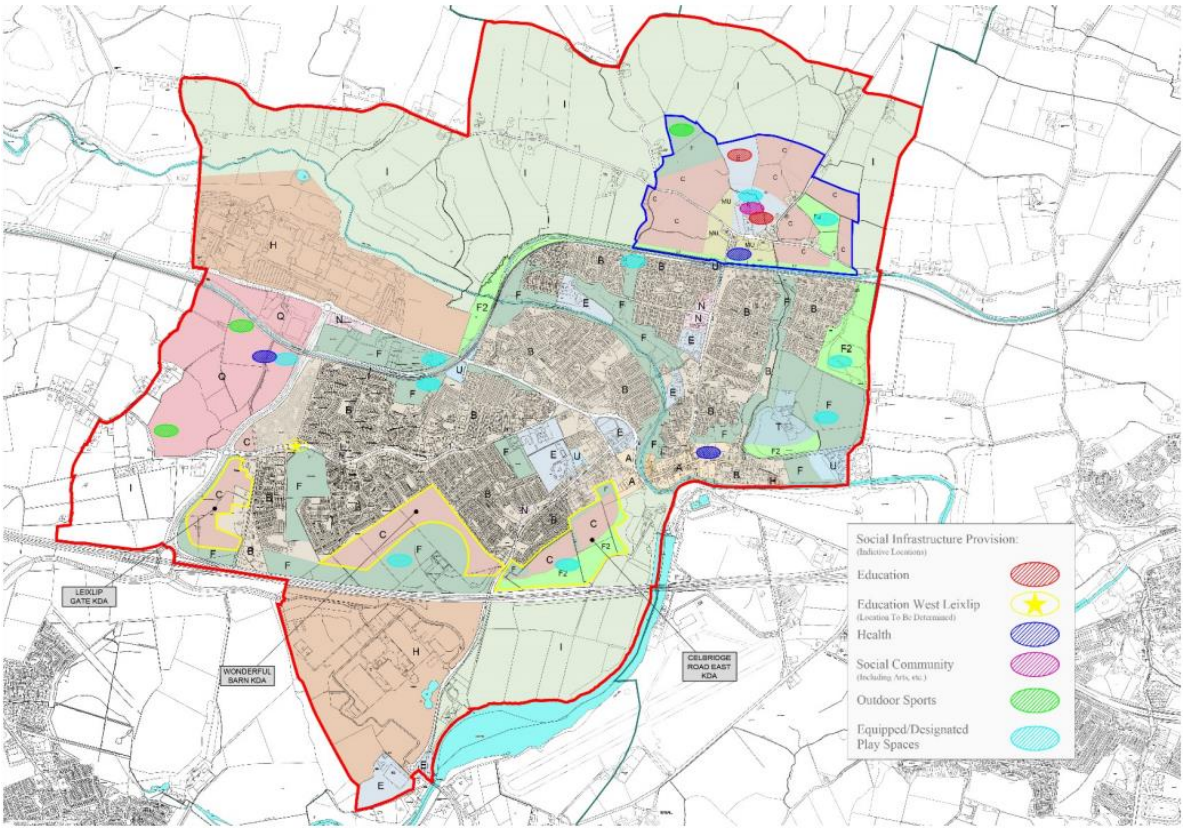

Figure 2-10 Leixlip LAP Land use Zoning (Source: LAP 2017-2023)

Section 8.2 of the LAP (Public Transport) states *"The DART Expansion Programme is a key project in the delivery of an integrated rail transport network for the Dublin region and includes the electrification of the Dublin-Sligo rail line from Connolly Station to Maynooth, together with the removal of level crossings and re-signalling"*. It recognises that the realisation of this project will improve the number and frequency of train services in addition to improved journey times.

2.3.10.4 Meath County Development Plan 2013-2019

The relevant policies contained in the Meath County Development Plan 2013- 2019 include the followings:

TRAN POL 6 *To promote, facilitate and advance the development of Phase II of the Navan railway line project and rail services in co-operation with other relevant agencies.*

TRAN POL 7 *To support the improvement of existing rail transport infrastructure including the Dublin/Sligo route with increased suburban services to Enfield and Kilcock, the existing Dublin – Drogheda rail service which serves the urban settlements of Laytown and Gormanston and to seek to have the proposed electrification of this rail line extended to Drogheda.*

Draft Meath County Development Plan 2020-2026

At the time of writing the draft Meath County Development Plan is currently at Stage two of the plan preparation process. The draft plan supports the project through policy:

MOV POL 9: *"To support the Dart expansion Programme including new infrastructure and electrification of existing lines, including provision of electrified services to Drogheda, Maynooth and M3 Parkway on the Maynooth/Sligo Line and on the Dublin-Belfast/Northern Rail Line*

MOV OBJ 2: *"To improve, in conjunction with the NTA and Irish Rail, facilities at existing stations"*

The draft Plan also recognised the higher-level planning and transportation policy remit (e.g. Regional Spatial and Economic Strategy 2019-2031) and references support for these policies (RPO 8.8) that relate to the delivery of this project which states: *"The RSES 2019-2031 supports delivery of the rail projects set out in Table 8.2, subject to the outcome of appropriate environmental assessment and the planning process.'*

These projects include:

- *Implement the extension of the Dunboyne/M3 Parkway line to Navan during the Mid Term Review of the GDA Transport Strategy;*
- *Dart expansion Programme - new infrastructure and electrification of existing lines, including provision of electrified services to Drogheda, Maynooth and M3 Parkway on the Maynooth/Sligo Line*."

It goes on to state that the "*Plan supports the prioritisation of these projects and will continue to support TII in the roll out of rail improvements and upgrades throughout the County*."

MCDP recognises that the Transport Strategy for the Greater Dublin Area (GDA) provides a framework for the planning and delivery of transport infrastructure and services over the period 2016 - 2035.

Dunboyne Clonee Pace LAP 2009-2015

The existing PACE M3 Parkway Train station is located within the development boundary of the Dunboyne Clonee Pace LAP. Relevant policies include:

MOV POL 4 *To facilitate and protect the operation of the railway in conjunction with Iarnród Éireann/CIE. To protect the Pace–Navan extension of the railway corridor from inappropriate development where all planning applications lodged within the route reservation corridor or which may impact on the future railway will be referred to Iarnród Éireann/CIE for comment.*

MOV POL 6 *To facilitate the development of Park & Rides as set out in the Railway Order NA0001 at Dunboyne Station & Pace Interchange*.

3. PROJECT DESCRIPTION

3.1 Background

The first of the infrastructural projects of the DART+ programme to be delivered will be the DART+ West (Maynooth line) project, the subject of this Informal Scoping report. The proposed project is seeking to significantly increase rail capacity on the Maynooth Line. This can be achieved by changing to electrified, high capacity DART trains and increasing the frequency of trains.

The electrification of the rail line will predominantly follow the existing railway corridor. Interventions outside of Iarnród Éireann lands will be required at a number of locations for some of the scheme elements such as:

- Overhead electrical equipment to electrify the line;
- Level crossing replacements, where required;
- Proposed depot;
- A new station at Spencer Dock;
- Construction of substations (to facilitate the provision of power to the line) and other minor electrical buildings and signalling equipment,
- Construction compounds and other associated construction works;
- Utilities diversions and connections such as grid connection for electricity; and;
- Ancillary works required for the project.

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
- 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 per section 1.3. the key elements of the proposed project have been identified to include:

- Electrification of the line by means of overhead line equipment (OHLE);
- Permanent level crossing closures (Ashtown, Coolmine, Porterstown, Clonsilla, Barberstown and Blakestown), with new replacement bridge crossings where required;
- Capacity enhancement works to Connolly Station (platforms, junctions & station modifications);
- Capacity enhancements and passenger experience by the relocation of Docklands Station to a new station at Spencer Dock;
- Construction of a new depot at west of Maynooth station and tie-ins to the network;
- Modifications to the permanent way and trackbed and all associated works including drainage, etc;
- Modification of road overbridges, as necessary, to achieve horizontal and vertical clearance to ensure operational rail safety;
- ESB grid connection to power the electrified lines and other utility diversions and provisions;
- New lineside electrical substations associated access and requirements;
- All associated construction and operational development works

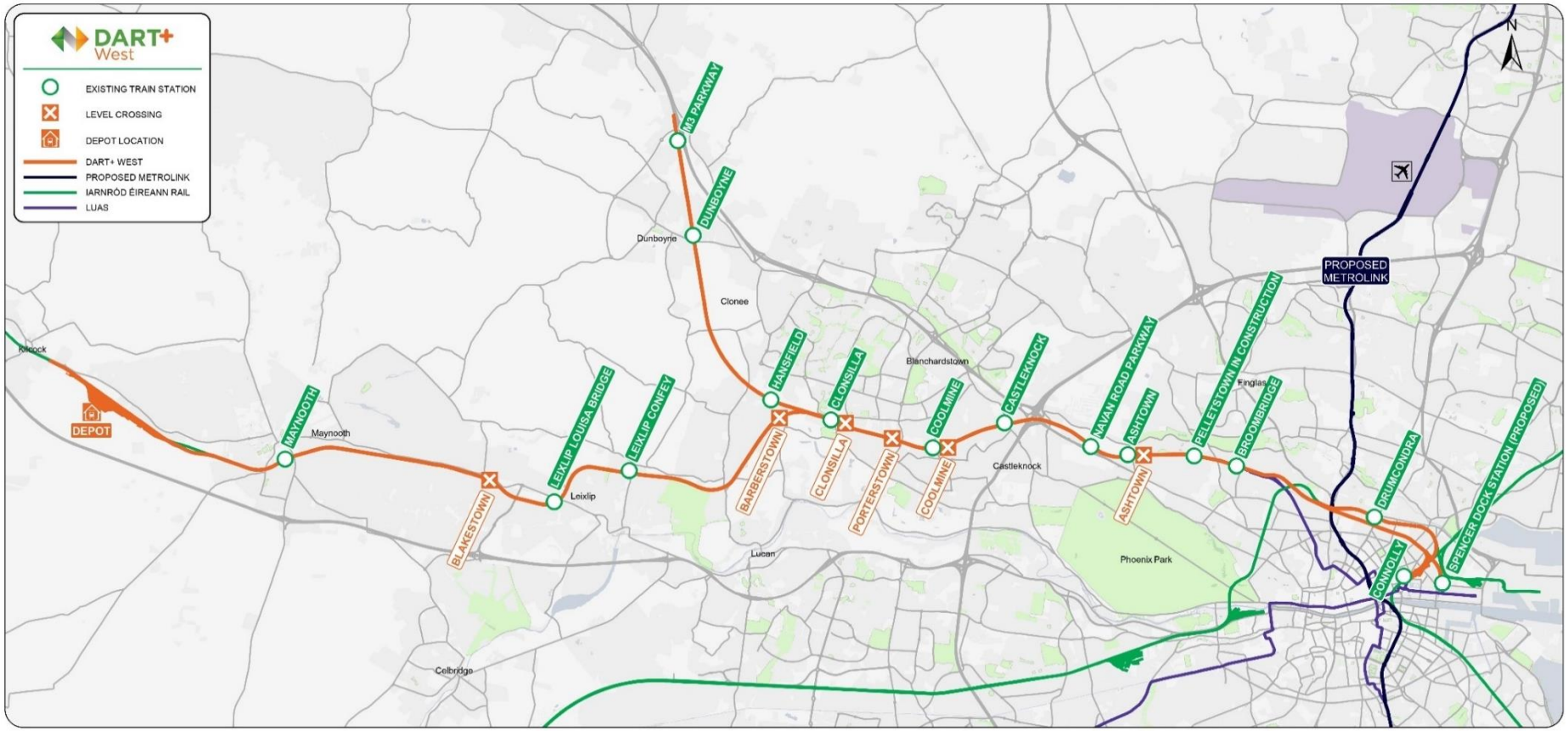

Figure 3-1 Schematic of DART+ West extent

3.4 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 the level crossing replacements, the depot, the provision of power to the line and modifications required along the main railway corridor.

3.4.1 DART+ West: Connolly Station and Spencer Dock Station

Connolly Station is one of the main railway stations in Dublin and a focal point for the Iarnród Éireann network.

The station today consists of four terminal platforms, (numbered 1 - 4), primarily for Northern Line services, including the Enterprise service to Belfast. Platform 4 can also be used for Sligo services, via Ossory Road Junction and Maynooth. Three through platforms (numbered 5-7) connect the Loop Line to the Northern line and the Phoenix Park Tunnel and Maynooth lines via Ossory Road Junction and Phibsborough. The station complex also includes a number of stabling roads (train parking) and maintenance facilities, primarily used to service the Enterprise train sets. The station facilitates Intercity, Commuter and DART services.

The principal objective of the project at Connolly station is to achieve the maximum level of service of 23 trains per hour per direction. The key issue with the current layout is that the terminal platforms are on the east side of the station, while the loop line through platforms are on the west of the station. The station capacity is constrained by the number of trains and by track crossing conflicts. DART+ West is seeking to modify the northern throat of Connolly Station rail lines with additional crossovers and track modifications to facilitate an increase in the station capacity. These modifications will facilitate additional operational flexibility at Connolly Station. As well as the track reconfiguration it is proposed to upgrade the platforms and the station itself to provide greater capacity for the predicted increase in passenger demand.

Notwithstanding the improvements delivered at Connolly, interventions are also required at Docklands Station to increase further the city centre terminating capacity. Thus, the proposed project envisages that part of the services to/from the west (Maynooth, M3 Parkway and Hazelhatch via the Phoenix Park Tunnel) is redirected to Docklands / the new Spencer Dock Station thereby increasing its importance within the network. It will also help to serve the rapidly developing Docklands area.

In relation to capacity enhancements at Docklands, an options assessment has been undertaken which has resulted in the selection of the relocation of the Docklands station to a new site at Spencer Dock (Option B2) as the preferred option. The preferred site is located at Spencer Dock South of Sheriff Street Upper and North of the current Spencer Dock LUAS station.

3.4.2 Level Crossing Closures

Iarnród Éireann proposes to close the six existing level crossings between Maynooth and Dublin city centre. A 2019 transport study commissioned by the National Transport Authority (NTA), in collaboration with Iarnród Éireann (IÉ), has recommended the following replacement infrastructure be provided in lieu of the permanent closure and removal of the level crossings on the Maynooth Line. The proposed level crossing closure programme is required to facilitate the increase in train capacity, whilst also ensuring that a sufficient level of service on the road network is maintained. Various options have been considered as part of the Options Selection process and the emerging preferred options at each of the level crossings form the basis of this Informal Scoping report. The Emerging Preferred Option presented at Public Consultation No.1 in August 2020 identified five new replacement crossings to be provided to maintain vehicular, pedestrian and cyclist access across the railway corridor. These options are under further consideration as part of the ongoing option selection process which will result in the Preferred Option being presented at Public Consultation No.2. Further details of the associated traffic modelling work is included in Chapter 5 of this report.

Table 3-1 Level Crossing Replacements (Preliminary Options Selection Report (July 2020)

Level Crossing	Recommendation
Ashtown	Provide a full vehicular/cyclist/pedestrian bridge crossing point.
Coolmine	Provide a full vehicular/cyclist/pedestrian bridge crossing point
Porterstown	Provide a cyclist/pedestrian bridge crossing point, with vehicles availing of the Diswellstown Road Bridge
Clonsilla	Provide a cyclist/pedestrian bridge crossing point
Barberstown	Provide a full vehicular/cyclist/pedestrian bridge crossing point
Blakestown	No new infrastructure provided given the low usage and availability of other existing proximal bridge crossing

3.4.3 Permanent Way

All the elements in Permanent Way must be designed to ensure the safety, the least intrusive and most cost-effective capacity enhancement and SET development to support the DART+ Programme. The proposed project entails upgrading the existing track alignment and ensuring suitable overbridge clearances for OHLE structures. This will require bridge modifications to some of the existing structures (some of which are protected structures), or track lowering or derogation of OHLE standards.

3.4.4 Electrification: Overhead Line Equipment (OHLE) and substations

The electrification of the rail line entails the provision of suitable OHLE to supply power to the electric trains. The key elements include protection against direct contacts, OHLE structures to support OHLE and auxiliary equipment and foundations for the structures. To support the increased capacity of the DART+ Programme, the proposed project will require a connection to the grid. Consultations have commenced with the ESB to identify suitable grid connection locations.

The proposed project will require the provision of the construction of a number of traction substations and other technical buildings along the rail lines and a dedicated traction substation at the proposed depot west of Maynooth.

The key infrastructural elements of the proposed project have been described above, further detailed designs and information will be developed and will inform the impact assessments that will be detailed in the EIAR.

3.4.5 Proposed Maintenance Depot and Depot Access

A new maintenance depot is proposed to be located west of Maynooth. The proposed depot will comprise the following facilities:

- Service Slab;
- Automatic Washing Plant;
- Automatic Vehicle Inspection;
- Deep Cleaning;
- Stabling area;
- Main Depot Building and Maintenance shed;
- Office and Administrative Building;
- Storage;
- Tandem Underfloor Wheel Lathe;
- Test track;

- Access Control Building, and;
- Electrical Substation.

A new entrance onto the existing road network will be required for depot staff and deliveries will be required.

3.4.6 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, the depot and stations and other locations for infrastructure or ongoing maintenance. In some locations these will be temporarily acquired, reinstated following completion of the works and returned to the landowner.

4. EIA PROCESS

4.1 Introduction

This chapter 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 (2) lists the required documentation when making an application, including a requirement for:

(e) a statement of the likely effects on the environment (referred to subsequently in this Part as an 'environmental impact statement') 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 2000-2021
- Planning and Development Regulations 2001-2020
- 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)
- S.I. 296 of 2018 European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018; and

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

- Guidance on EIA Scoping (European Commission, 2017);
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017); and
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015).

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 each environmental factor's chapter contained 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.

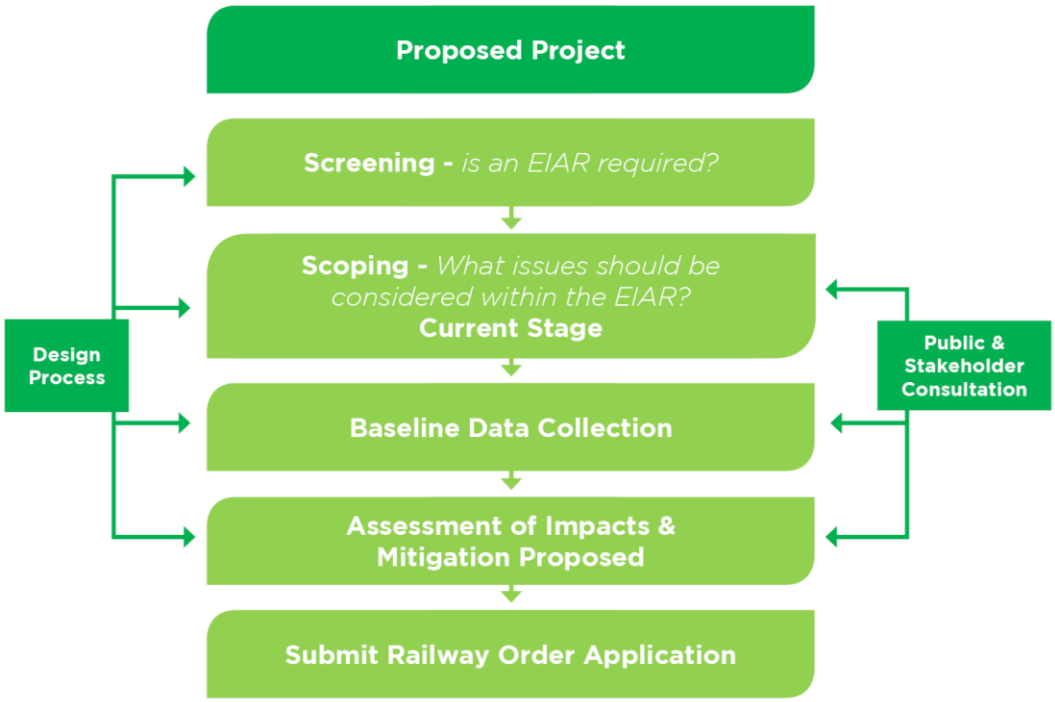

Figure 4-1 Overview of EIA Process

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, alternative: locations, alignments, processes or equipment, 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 in 2020. 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 2020) and assesses the options under the following criteria:

- Economy
- Safety
- Environment
- Accessibility & Social Inclusion

- Integration
- 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 assessment process;
- 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 development 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
- Cumulative impacts

Although cumulative impacts will be addressed under each of the environmental topics, 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 Screening Report (Stage 1) will be prepared by the competent authority (in this case Iarnród Éireann) 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 Appropriate Assessment (AA) process will be undertaken concurrently with the EIAR, 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.

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 –*

a) the procedures involved in making an application under this Part and in considering such an application, and

b) 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 four meetings have been held.

4.9.2 Prescribed Bodies & Key Stakeholders

All prescribed bodies were written to on 29th May 2020. 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 Informal EIA Scoping Report as part of the Scoping process. Table 4-1 below provides a list of Prescribed bodies and some of the unprescribed 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
Kildare 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
County Kildare Chamber	IBEC
Construction Industry Federation	EIRGrid
ESB Networks	Bord Gais
Gas Network Ireland	Irish Wildlife Trust
Botanical Society of Britain & Ireland	Eir Group
Local Government Management Agency	Met Eireann
Minister for Business, Enterprise and Innovation	Minister for Enterprise, Trade and Employment
Bord Iascaigh Mhara	

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 consider non-statutory public consultation to be an essential part of the development of public infrastructure schemes and. IÉ endeavors 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 August 2020 and ran for 8 weeks until 21st October 2020. The Emerging Preferred Option was presented for the Level Crossing replacements and at the Depot 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 early in 2021.

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 in person, whilst complying with the social distancing guidance and government restrictions at that time.

The project website (**www.irishrail.ie/DARTMaynooth**) has been established and hosts all information relating to the project. A mail drop to c. 13,000 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 early 2021.

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 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 physical roadshow type event can be held subject to the easing of government's Covid-19 restrictions.

4.9.4 EIA Scoping Consultation

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

- Is the scope of the proposed assessment for the EIAR adequate?
- Is there any additional information that should be considered in the development of the proposed project?
- Are there any additional environmental issues that should be taken into consideration in preparing the EIAR?

All relevant submissions on the proposed project are welcome.

5. TRAFFIC AND TRANSPORTATION

5.1 Introduction

This chapter 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, its construction and operation will have significant impacts in terms of traffic and the general movement of people and goods.

The objective of this chapter 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 draft, August 2017	The document outlines topics, relative to Roads & Traffic, that are typically addressed in an EIAR
Traffic & Transport Assessment Guidelines, NRA (now 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 Development Plan 2017-2023	
Fingal County Development Plan 2017-2023	
Meath 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 scheme, 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. In the most part, it is bounded by the M3 (as far as Junction 4 Clonee) to the north and the M4 (as far as Junction 7 Maynooth) to the south. The western extent is the proposed depot location between Maynooth and Kilcock, while the eastern extent is just beyond Ashtown level crossing. The study area includes the M50 Junction 6 Castleknock and Junction 7 Lucan, but not the M50 mainline.

5.3.2 Transport Modelling

The transport modelling methodology is summarised in Figure 5-1 and outlined thereunder.

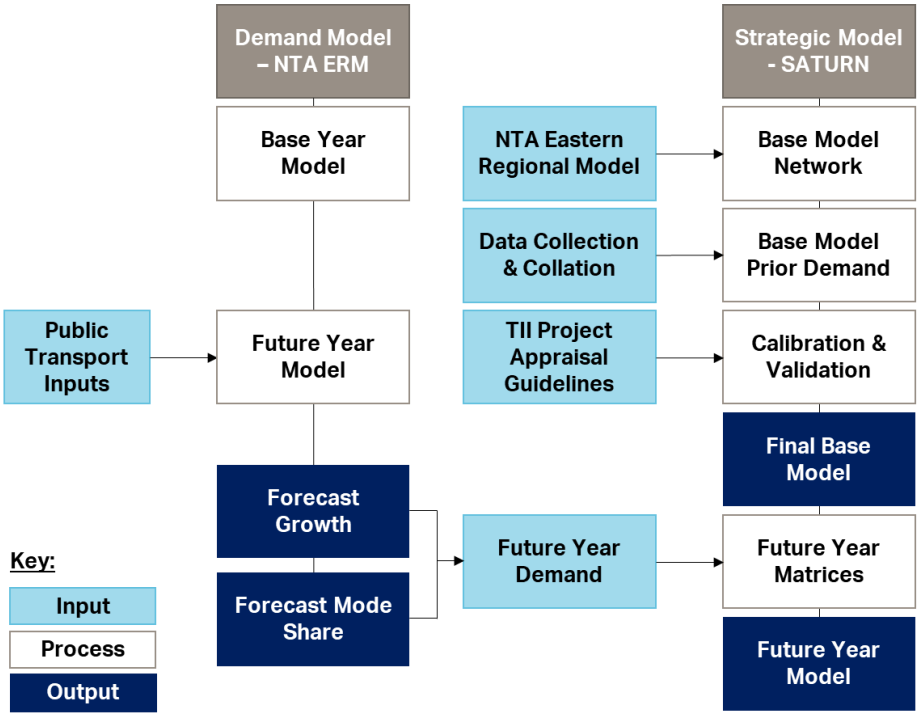

Figure 5-1 Transport Modelling Methodology

A Local Area Model (LAM) will be developed in SATURN using a cordon from the NTA's Eastern Regional Model (ERM). The LAM will be calibrated for 2019 conditions using traffic survey data collected, as outlined in Section 5.4. A LAM has the advantage of having a greater level of local specificity compared to using the full ERM. Scheme impacts are more likely to show up as significant without the 'background noise' of the full model.

To be able to measure the impact of the proposed scheme, 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+ West.

Outputs form the NTA's ERM Base and amended future year (2028 and 2043) models (growth in demand, traffic flows and changes in mode share etc.) will then be used, along with existing mode share data, to calculate the applicable growth rates to apply to the calibrated 2019 LAM, to determine the appropriate demand for the Do Minimum scenario.

The Do Minimum road network will contain any planned road improvements that will be in place by 2028. This also be agreed with the NTA/TII in advance.

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 closing of the level crossings, while the demand will be updated to reflect changes in mode share brought about by the proposed scheme, taken from ERM outputs.

An 'Opening Year +15' assessment will also be undertaken by increasing the background demand by an appropriate factor derived from NTA ERM outputs, 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, below.

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 NTA ERM outputs
	Reduced waiting times for rail passengers due to improved service.	Comparison of Do Minimum vs Do Something timetables
	Change in Bus journey times due to changes to local road networks and traffic flows.	Journey time analysis for bus routes in the vicinity of the scheme
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 closing of level crossings.	Using distance as a proxy for time, investigate end to end distance for select journeys in the vicinity of the scheme
	Anticipated change in number of cyclists	Using the GDA Cycle Network Plan model
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 closing 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
Other	Modal Shift	Mode share outputs from ERM

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 Draft EPA Guidance.

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.

An up to date Demand Modelling study is being carried out by AECOM using the National Transport Authorities Eastern Regional Traffic Model. Once this is complete the cordoned local area models for the project will be updated for new demand figures and the emerging preferred options in respect of each principal scheme element.

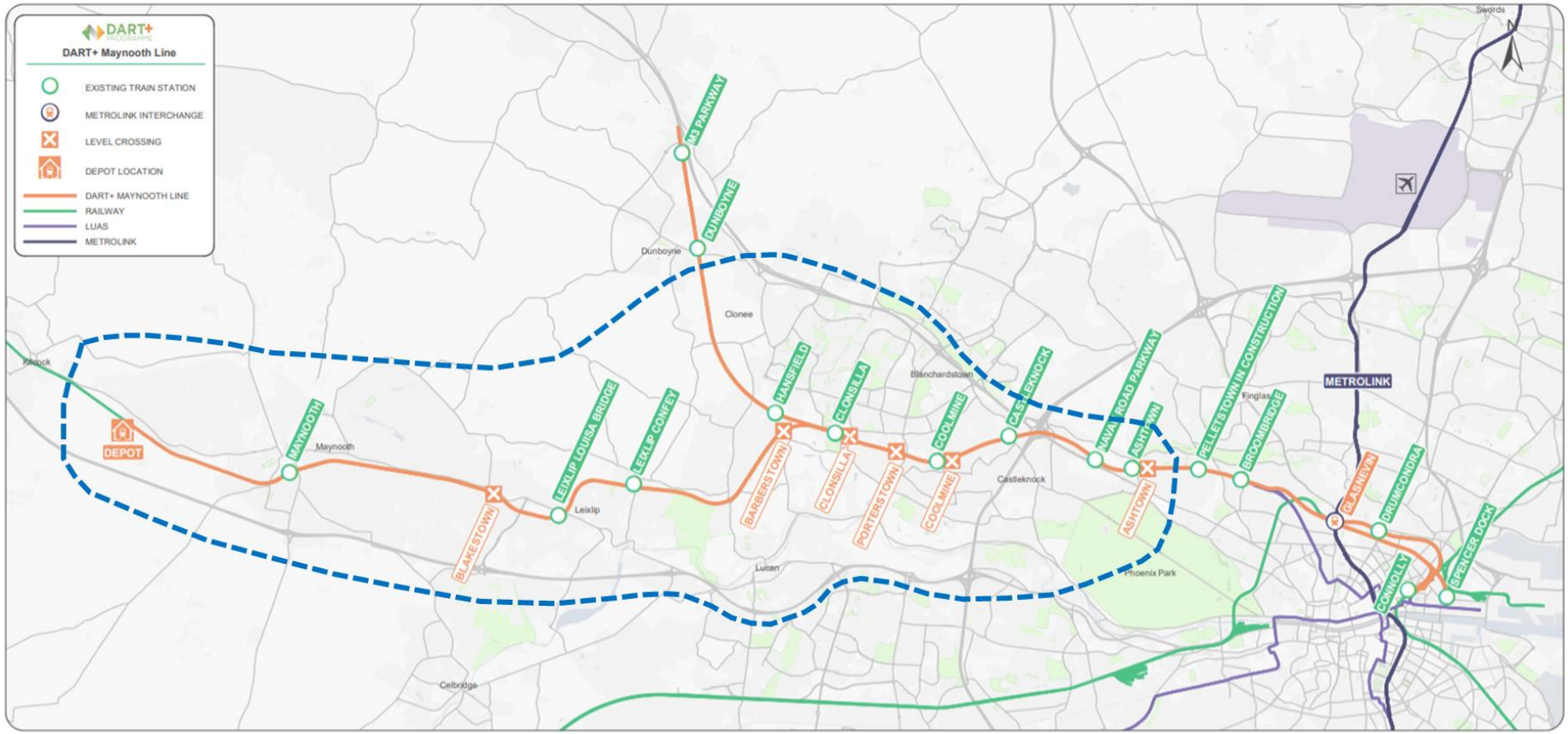

Figure 5-2 Proposed Study Area

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

5.4.1 Background and Context

Previous studies and reports reviewed to inform the proposed project include the following:

- DART Expansion Programme Options Assessment – Addendum Report; August 2018; by Systra / Jacobs for IE and the NTA;
- DART Expansion Programme Options Assessment; October 2018; by Systra / Jacobs for IE and the NTA;
- Maynooth Line Transportation Study Draft Final Report, July 2019; by CSEA / Systra for the NTA;
- NTA DART Expansion Programme Future Patronage Modelling, June 2020; by Systra / Jacobs for the NTA.

The above reports documented DART+ Network modelling, demand modelling, and traffic assessment in respect of local areas affected by the proposed project.

5.4.2 Traffic Counts

The traffic survey data collected in January 2019 included the following:

- Automatic Traffic Counts (ATC) at 35 location;
- Pedestrian and Cyclist counts at 2 locations; and
- Junction Turning Counts (JTC) at 48 locations;
- Supplementary counts by Fingal County Council;
- Journey time information NTA database.

The Automatic Traffic counts collected the following information over a 3-week period from Monday 28th January to Sunday 14th February

- 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

The ATC data was collected at all locations crossing the Maynooth Rail line within the study area. The results indicate that the Porterstown Viaduct is the most heavily trafficked crossing point at AM peak (08:00-09:00) with approx. 1,573 vehicles in both directions. Of the level crossings, Coolmine experiences the largest traffic volumes with 518 vehicles in the AM peak hour, followed by Ashtown with 454 vehicles. Blakestown experiences relatively low traffic volumes with only 12 vehicles recorded in the AM peak hour.

Similarly, in the PM peak the Porterstown Viaduct carries the highest traffic with 1,647 vehicles recorded between 17:00 and 18:00. The other bridge crossings at the R149 and Castleknock Road also carry significant volumes with 840 and 1,265 vehicles respectively. Again, Coolmine is the most heavily utilised level crossing with 447 vehicles recorded in the PM peak hour. Porterstown, Barberstown and Blakestown all experience relatively low volumes of traffic with two-way flows of 59, 71 and 13 respectively.

Figure 5-3 and Figure 5-4 below illustrate the AM and PM peak figures for the crossing points of the railway within the study area.

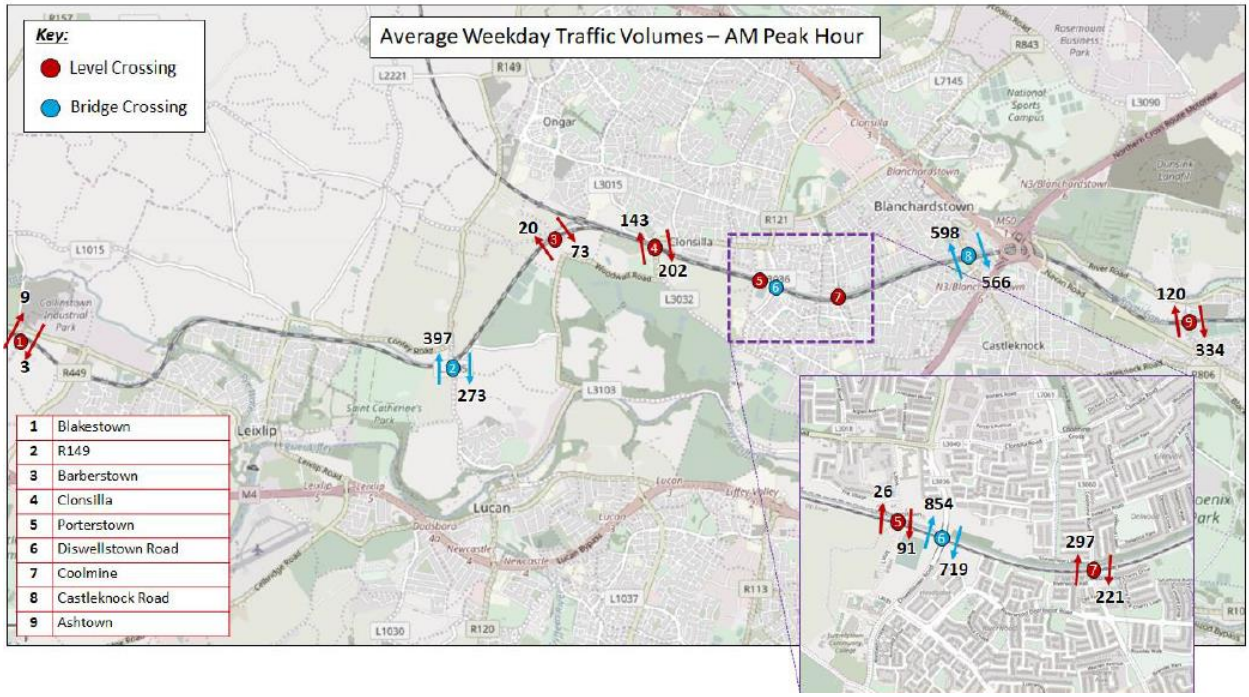

Figure 5-3 AM Peak ATC Counts – CSEA Systra Oct 2019

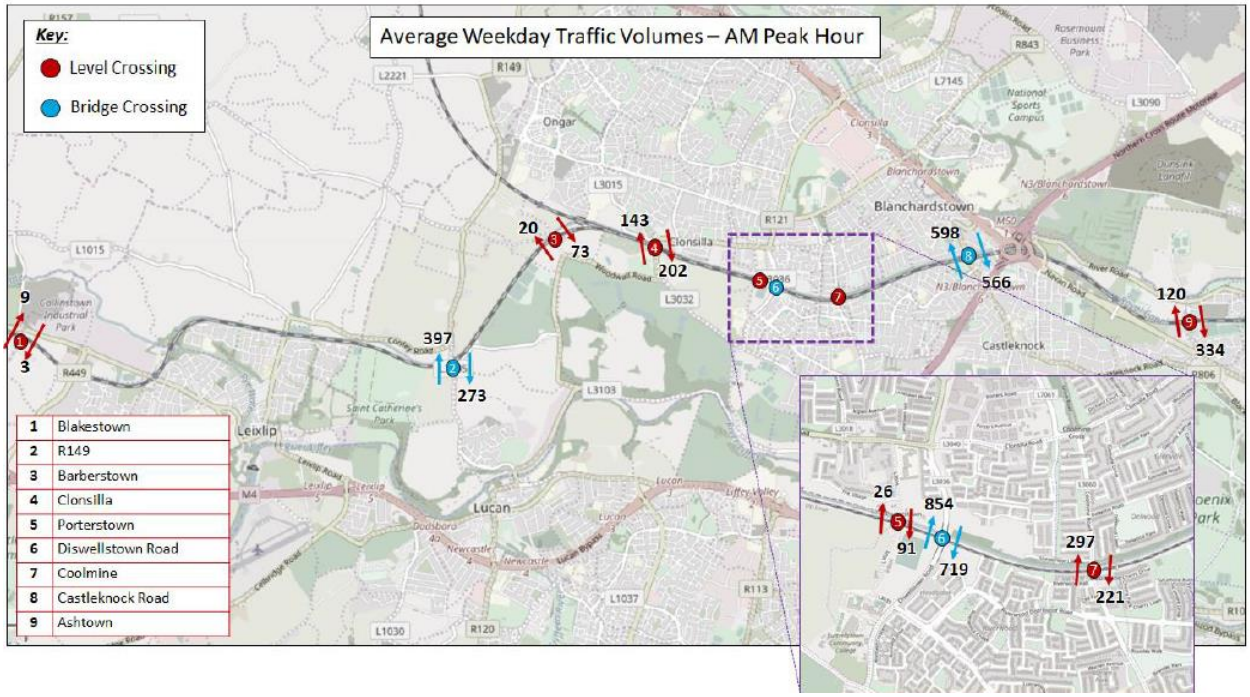

Figure 5-4 PM Peak ATC Counts – CSEA Systra Oct 2019

5.4.3 Pedestrian and Cycle Counts

Pedestrian and cyclist counts were undertaken at Ashtown and Blakestown level crossings on Tuesday 5th February 2019 between 07:00 to 10:00 in the AM, and 16:00 to 19:00 in the PM. This data was supplemented with counts undertaken by Fingal County Council at Coolmine, Porterstown, Clonsilla and Barberstown.

The figures for Barberstown and Blakestown are presented in Table 5-4. The figures indicated a very low level of usage currently.

Table 5-4 AM & PM Pedestrian and Cycle Counts – CSEA Systra Oct 2019

Crossing	Time Period	Pedestrians		Cyclists	
Barberstown	AM	0	0	2	1
	PM	0	0	3	0
Blakestown	AM	0	0	1	0
	PM	0	2	0	2

The figures for other locations supplied by Fingal County Council are presented graphically in Figure 5-5, Figure 5-6, Figure 5-7 and Figure 5-8 below, and show that each of the suburban level crossings experience significant levels of both pedestrian and cycle traffic.

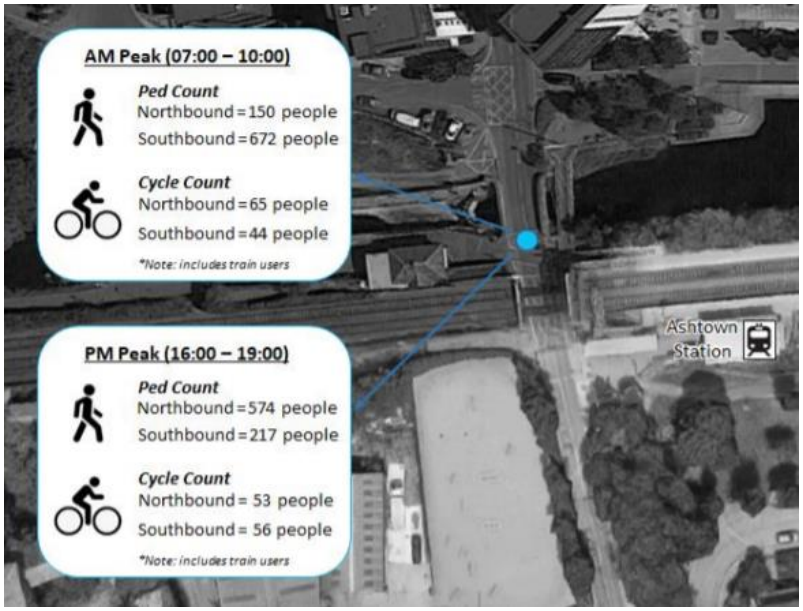

Figure 5-5 Ashtown Pedestrian and Cycle Counts

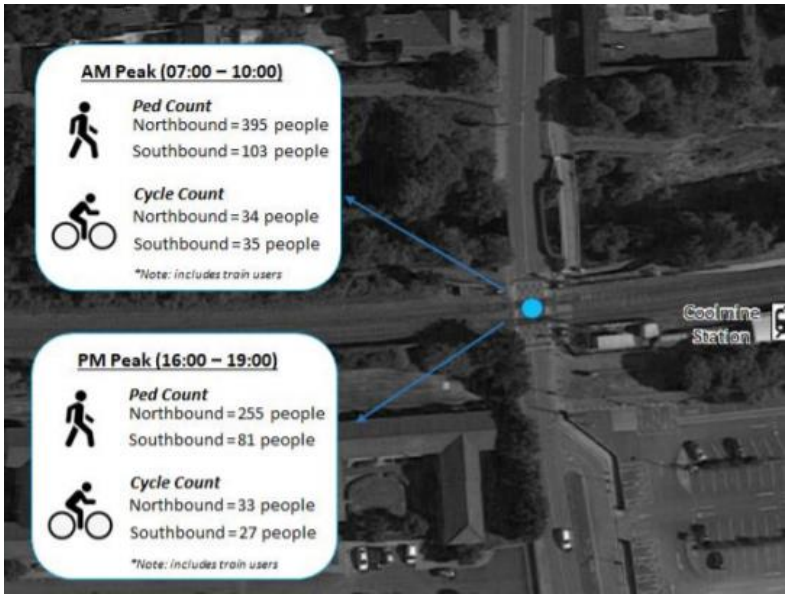

Figure 5-6 Coolmine Pedestrian and Cycle Counts

Figure 5-7 Porterstown Pedestrian and Cycle Counts

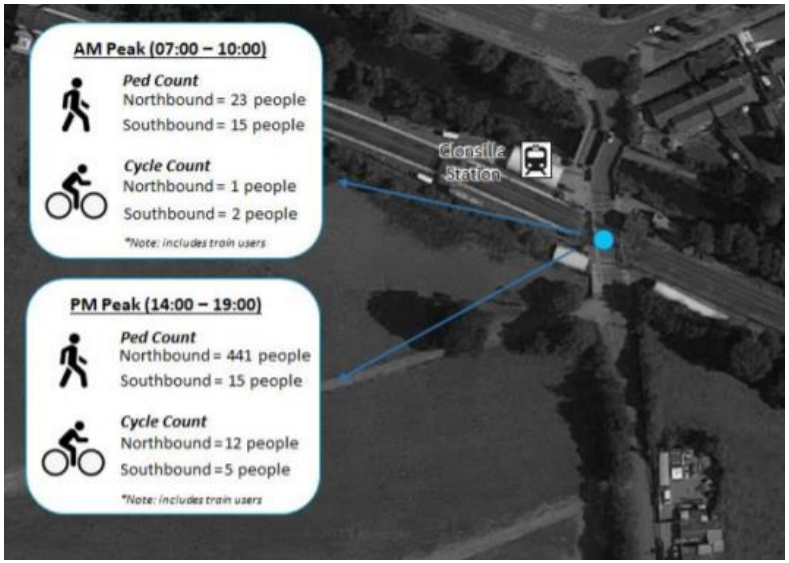

Figure 5-8 Clonsilla Pedestrian and Cycle Counts

5.4.4 Baseline Journey Times

Baseline bus journey times were received from the NTA satellite navigation database for the Blanchardstown and Ashtown cordoned areas as illustrated in Figure 5-9 and Figure 5-10. They address both the AM (08:00-09:00) and PM (17:00-18:00) peak hours. These journey times may be required to be updated to reflect all modes of transport.

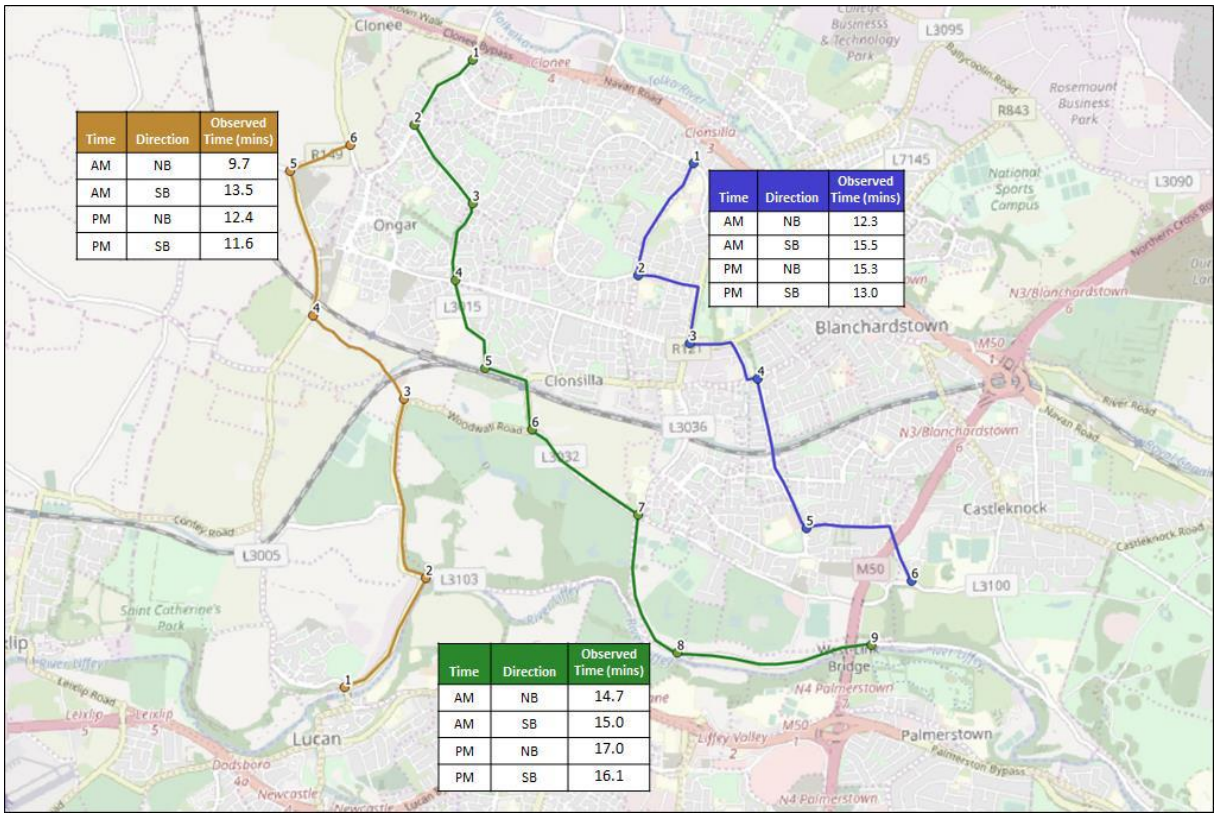

Figure 5-9 AM & PM Blanchardstown Baseline Journey Times – CSEA Systra Oct 2019

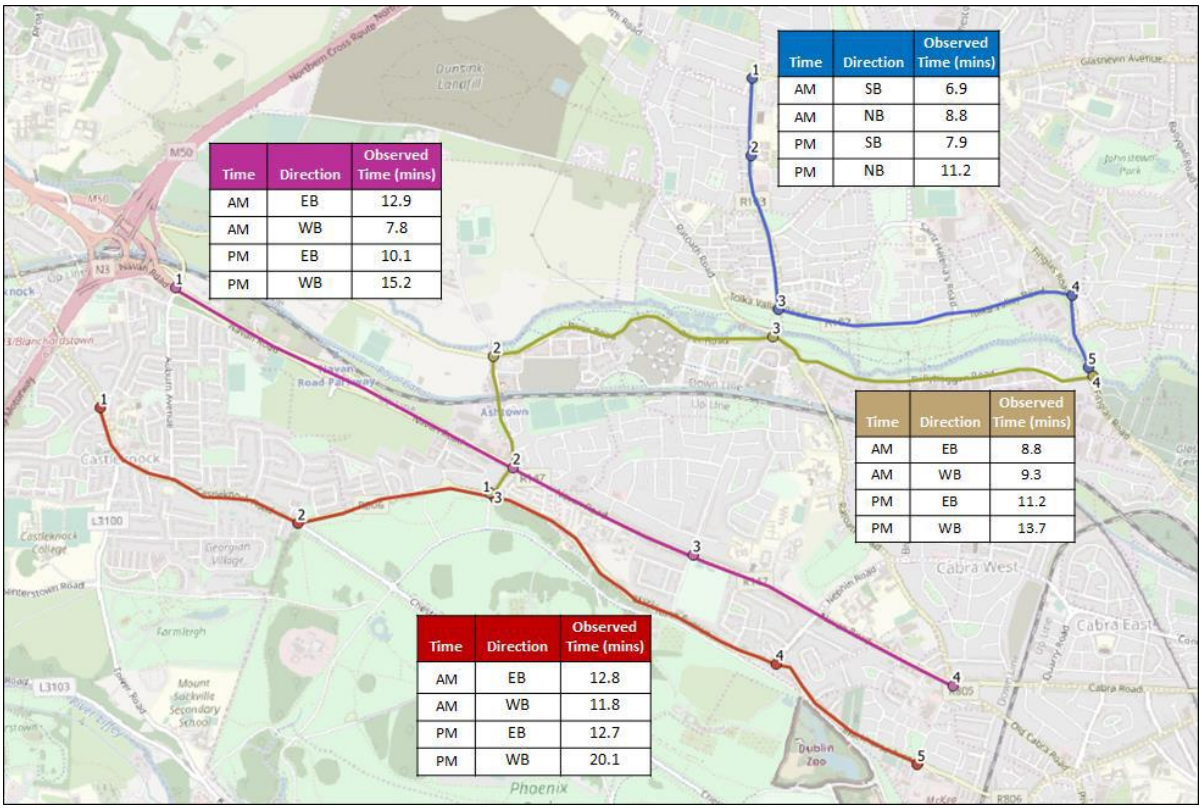

Figure 5-10 AM & PM Ashtown Baseline Journey Times – CSEA Systra Oct 2019

5.4.5 Existing Train Services

Table 5-5 and Table 5-6 present the principal current railway traffic statistics for the level crossings for the AM and PM peak hours.

Table 5-5 AM Railway Stats for the Level Crossings – CSEA Systra Oct 2019

Level Crossing	No. Trains Passing	No. Closures	Total Closure Time	Average Time per Closure
Ashtown	13	6	00:36:42	00:06:07
Coolmine	12	9	00:41:35	00:04:37
Porterstown	12	7	00:32:46	00:04:41
Clonsilla	12	7	00:30:58	00:04:25
Barberstown	9	6	00:26:03	00:04:21
Blakestown	7	5	00:23:48	00:04:46

Table 5-6 PM Railway Stats for the Level Crossings – CSEA Systra Oct 2019

Level Crossing	No. Trains Passing	No. Closures	Total Closure Time	Average Time per Closure
Ashtown	11	6	00:36:32	00:06:05
Coolmine	11	7	00:34:14	00:04:53
Porterstown	10	6	00:19:57	00:03:20

Level Crossing	No. Trains Passing	No. Closures	Total Closure Time	Average Time per Closure
Clonsilla	10	4	00:26:30	00:06:38
Barberstown	7	6	00:20:37	00:03:26
Blakestown	7	6	00:21:54	00:03:39

5.4.6 Bus Routes

A review was undertaken of existing bus services within the study area to identify if any routes would be disrupted due to the closure of the six level crossings along the Maynooth rail line.

Currently, only route 239 operated by Go Ahead Ireland travels via the existing level crossings. The route, illustrated in Figure 5-11 below, operates from Blanchardstown Shopping Centre to Liffey Valley Shopping Centre via the Clonsilla level crossing. The service operates approximately once per hour throughout the day in each direction, with one service in each of the AM and PM peaks.

The planned BusConnects network is illustrated in Chapter 2 of this report. BusConnects will replace route 239 with route 252.

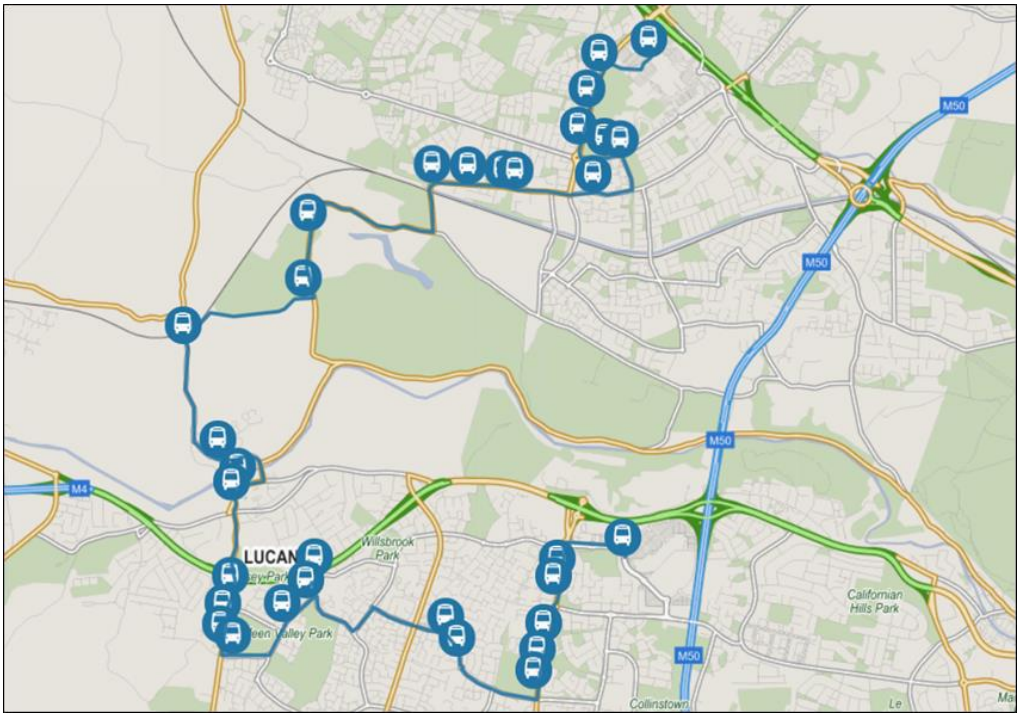

Figure 5-11 Go Ahead Ireland Route 239 (Transport for Ireland Journey Planner Map)

5.4.7 Access and Pedestrian and Cycle Facilities

The accessibility conditions at level crossings and provision for pedestrians and cyclists is generally considered to be deficient. The proposed project seeks to improve this access and facilities. A detailed review of baseline will inform the design issues and the assessment of impacts will be included in the EIAR.

5.5 Potential Impacts

5.5.1 Construction Impacts

The likely construction phase impacts are outlined below:

Table 5-7 Likely Construction Phase Impacts

Activity	Impact	Scope In / Out
Movement of materials to and from site	Increase in HGV movements in and around the local area.	Scope In
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.	Scope In
Disruption to existing rail services	Potential for reduced services, particularly on weekends	Scope In
Loss of parking and disruption of access at stations	Disruption to existing commuting patterns	Scope In

On the basis of the potential impacts presented above, the assessment of construction traffic impacts has been scoped into the EIAR. Since the DART+ West 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.

5.5.2 Operational Impacts

The Likely operational phase impacts are outlined below:

Table 5-8 Likely Operational Phase Impacts

Scheme Element	Impact	Scope In / Out
Improved frequency, and efficiency of train services	Modal Shift, leading to reduced traffic flows on the surrounding road network.	Scope In
Removal of existing level crossings	Changes to existing road network, leading to a potential re-distribution of local traffic.	Scope In
	Improved efficiency of local road network due to removal of need to stop at level crossings.	
	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.	
Provision of depot facility	Trip generation associated with staff accessing depot.	Scope In

On the basis of the potential impacts presented above, the assessment of operational traffic impacts has been scoped into the EIAR.

6. POPULATION

6.1 Introduction

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

In accordance with the draft EPA Guidelines (2017), 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 Chapter outlines the relevant policy and guidance that will be consulted to carry out the population assessment as part of the EIAR, sets out the methodology, provides a high level description of the existing environment, and sets out the potential impacts on population during the construction and operational 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 Chapter 4 of this Report (relevant EIA legislative). In addition, the following planning policy documents (not exhaustive) will be referred to:

- Project Ireland 2040 – National Planning Framework 2040 and National Development Plan 2018 – 2027;
- Eastern and Midland Regional Spatial and Economic Strategy 2019 - 2031
- Dublin City Development Plan 2016 – 2022;
- Fingal Development Plan 2017 – 2023;
- Kildare County Development Plan 2017 – 2023;
- Meath County Development Plan 2013 – 2019;
- Ashtown – Pelletstown Local Area Plan, 2014;
- Pelletstown LAP 2014
- Hansfield SDZ Planning Scheme, 2006;
- Kellystown Local Area Plan Issues Paper, 2019;
- Draft Local Area Plan for Kellystown, Dublin 15, 2020
- Barnhill Local Area Plan, 2019;
- Leixlip Local Area Plan, 2020 – 2023;
- Maynooth Local Area Plan, 2013 – 2019.

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);
- 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 equestrians, 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, lifting 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 address 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);
- Pobal data;
- 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 development 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.

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, Kildare 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

Land Use

The proposed project is within Dublin City, and the Counties of Fingal, Kildare and Meath. From east to west, the proposed project travels through Dublin City centre, an established urbanised, mixed-use development area. As the route travels into westwards towards Fingal, Kildare and Meath the land uses become more sub-urban in nature with some significant greenfield sites interspersed along the rail line earmarked for future development. The future development intent is included in the development plans and also various LAPs/Masterplans to include: Pelletstown LAP 2014, Barnhill LAP 2019, the Draft Local Area Plan for Kellystown, Dublin 15, 2020, Leixlip LAP 2020 - 2023, Maynooth LAP 2013 – 2019, and the future Collinstown Masterplan.

There are also some significant commercial, business and light industrial uses within the study area including a number of industrial estates, to include: Dublin Industrial Estate, Royal Canal Park and the Coolmine Industrial Estate. Land uses with specific functions such as the transport infrastructure (DART, Dublin bus etc) and amenities, such as the Royal Canal, Tolka Valley Park, Phoenix Park are also present in proximity to the proposed project. Land uses within the study area will be categorised and mapped and will inform the design stages and the impact assessment that will be reported in the EIAR.

Transport Routes/Patterns

Relevant desktop information will be obtained during the transport assessment as part of the EIAR. This will inform any community severance issues. At county level, information from Census 2016 CSO data will be used to inform travel patterns within counties Dublin City, Fingal, Kildare and Meath.

CSO states that the population using public transport (which includes bus and rail) as means of travel to work, school or college is 22% in Fingal and Dublin City; Kildare and Meath are both at 13%

Dublin City is reported as having the highest percentage of people travelling by foot/cycling at 35%, followed by Fingal, Kildare and Meath at 18%, 15% and 14% respectively. Meath and Kildare have the highest percentage of population utilising private car as means of travel at 69% and 66% respectively. The private car is also the primary mode of travel in counties Fingal and Dublin City, at 55% and 34% respectively.

Education

Education levels have greatly improved in Ireland, particularly over the last two decades. In 2016, 42% of population of the State had a third level education compared with 13.6% in 1991. Education based activities can generate significant transport demand. At county level, there are a large number of educational facilities, including primary, secondary and third level institutions in the area such as Maynooth University and Trinity College Dublin. Further detailed analysis for the proposed development and potential impacts on educational land use facilities will be undertaken in the EIAR.

Population & Demographics

Census 2016 reports that Ireland experienced an increase in population of 3.6% (+173,613 persons) since the the 2011 Census. Leinster experienced a 5.2% increase in population over this period and was the only province to record a greater increase in population than the 3.6% State average. Over the same Census period Fingal experienced the greatest change in population, growing by 8%(+22,029 persons); Dublin City increase of 5.1% (+26,942 persons); Co. Kildare experienced a 5.8% increase in population (+12,192 persons), and Co. Meath experienced a 5.6% (+10,909 persons). Population and demographic data will be used to inform the population assessment in the EIAR.

Economic Activity

The workforce is the main driver of economic activity at national and regional levels. As a means of travel, the public transport network plays a vital role in the daily lives of a workers by facilitating movement between their places of home and work and thus reliable and efficient public transport supports economic activity across the area.

The labour force consists of those who are able to work i.e. those aged 15 and over and out of full-time education. Nationally, the labour force participation rate (labour force divided by the total working-age population) slightly decreased over the 2011 to 2016 period, from 61.9% to 61.4%[3] respectively. However, there was a decline in unemployment rate from 19.2% in 2011 to 13% in 2016. According to census 2016 Dublin City, Fingal, Kildare and Meath had a combined total of approximately 578,000 persons employed and approximately 77,000 persons unemployed.

Tourism also plays an important role in economic activity, especially in Dublin City which includes a number of museums in proximity to the proposed project as well as other amenity areas, such as the Phoenix Park and Dublin Zoo, Trinity College Dublin within a walking distance from the existing train stations. A review of land uses and the economic activity within the area of proposed project will be carried out to inform the assessment.

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;
- Temporary disturbance and nuisance from construction activities on properties, local businesses and communities located in proximity to the proposed construction works.

[3] CSO Census 2016. Profile 11 – Employment Occupations and Industry.

- Temporary positive impacts on economic activity due to localised expenditure by construction workers and purchase of construction related materials;
- Temporary positive impacts as a result of local direct and indirect employment opportunities during the construction period;

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;
- By removing the road – rail interaction at the existing level crossings there are likely to be both positive and negative impacts on land use, journey characteristics, amenity, severance and economic activity;
- 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; and
- The proposed project will support tourism activity and recreation within the Dublin.
- Potential impacts due changes in transport network, journey amenities, severance, and access to public amenity/open space.

7. HUMAN HEALTH

7.1 Introduction

Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." This chapter addresses the potential impacts on human health relating to the construction and operational phases of the proposed project. Significant improvements between Dublin City and Maynooth and M3 Parkway are proposed as part of the proposed project that will provide a high-capacity electrified public transport option. The proposed project includes performing 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 draft EPA Guidelines (2017), 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 chapter 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 the construction and operational 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 (2017) see Chapter 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),
- The latest draft EPA Guidelines (2017).

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 Draft EPA Guidelines (2017) 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 Kildare Health Profile 2015
- Lenus Meath Health Profile 2015
- CSO Census 2016 data on Health, Disability and Carers;
- CSO Census 2016 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);
- Other relevant environmental data considered during the various environmental assessments,
- Consideration of issues/ concerns raised during public consultations;
- 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 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 the other specialist's assessment of 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

Health Profile

The Health in Ireland – Trends in 2019[4] prepared by the Department of Health published the latest health statistics in Ireland and the EU28 States. Ireland has been reported to have a higher life expectancy at birth than the EU28 average. Since 2007, the life expectancy in males increased by 3 years, and the increase for females was almost 3 years. Additionally, Ireland has the highest self – perceived health status in EU, with 82.9% of the population rating their health as good or very good.

At regional level, Lenus the Irish Health Repository prepared health profiles in 2015 for all Local Authorities. Some of the key data from the Lenus Health Profiles for counties Dublin City, Fingal, Kildare and Meath are identified below.

Dublin City[5]

- The deprivation relative score in Dublin City is marginally above average when compared to the national average.
- The percentage of people reporting bad or very bad health or who have a disability is 2% and 14.9% respectively within the county, which is higher than the national average.
- The dependency population ratio (those aged 0 -14 and 65 year and over as a proportion of those aged 15 – 64) is 38.4% which is lower than the national average rate of 49.3%.
- Rates of mortality for all causes and the major causes of mortality and for all ages are either average or below the national average.

Dublin Fingal[6]

- Fingal County is the second most affluent Local Authority in Ireland, where 85% of its population are either above average or affluent.
- The percentage of people reporting bad or very bad health or who have a disability is 1.1% and 10.2% respectively within the county, which are lower than the national average.

[4] Health Trends in Ireland – Trends in 2019. Available at: https://www.gov.ie/en/publication/f1bb64-health-in-ireland-key-trends-2019/
[5] Lenus Health Profile 2015 Dublin City. Available at: https://www.lenus.ie/handle/10147/584037
[6] Lenus Health Profile 2015 Fingal. Available at: https://www.lenus.ie/handle/10147/584023

- Fingal has a dependency population ratio (those aged 0 -14 and 65 year and over as a proportion of those aged 15 – 64) of 46%, which is lower than the national average of 49.3%.
- Rates of mortality for all causes and the major causes of mortality and for all ages are above the national average.

Kildare[7]

- Kildare is the fifth most affluent Local Authority nationally.
- The percentage of people reporting bad or very bad health or who have a disability is 1.4% and 12.5% respectively within the county, which is higher than the national average.
- Kildare has a slightly lower dependency population ratio (those aged 0 -14 and 65 year and over as a proportion of those aged 15 – 64) of 48% when compared to the national average of 49.3%.
- Rates of mortality for all causes and the major causes of mortality and for all ages are either average or below the national average.

Meath[8]

- The deprivation relative score in Meath is marginally above average when compared to the national average.
- Meath has the lowest percentage of those who report their health as being bad or very bad at 1.1% (national rate 1.5%) and a low percentage of those with disability of 10.7% (national 13%).
- Meath has a higher dependency population ratio (those aged 0 -14 and 65 year and over as a proportion of those aged 15 – 64) of 55.6% when compared to the national average of 49.3%.
- Rates of mortality for all causes and the major causes of mortality and for all ages are below the national average.

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).
- Air quality impacts (with reference to the separate air quality assessments.

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.
- Potential impacts due to electromagnetic force (with reference to the specific assessments contained in the EIAR).

[7] Lenus Health Profile 2015 Kildare. Available at: https://www.lenus.ie/handle/10147/584022
[8] Lenus Health Profile 2015 Meath. Available at: https://www.lenus.ie/handle/10147/584018

8. BIODIVERSITY

8.1 Introduction

This chapter 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 Kildare Biodiversity Plan 2009 - 2014 (KCC, 2009)
- County Kildare Heritage Plan 2019-2025 (KCC, 2019)
- 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)
- 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 (2017) Draft Guidelines on information to be contained in the Environmental Impact Assessment Report.
- EPA (2015) Draft Advice Notes for preparing Environmental Impact Statements.
- EPA (2002) Guidelines on the Information to be Contained in Environmental Impact Statements.
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- 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.
- 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 Transport Infrastructure Ireland (TII) Guidelines for Assessment of Ecological Impacts of National Road Schemes (2009) 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 development;
- 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);

- 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; and,
- Draft Maynooth Line Railway Order Environmental Impact Statement (ROD, 2011)

Following the desk study, field surveys will be conducted over the full area of the proposed development 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);
- 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 been 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 50 m 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). The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix A.

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

The statutory and non-statutory consultees listed below will be contacted during the desk study and invited to submit any observations for the planned Public Consultation. Consultees will be provided with a map of the proposed project.

<u>Statutory</u>

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

Non-Statutory

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

8.4 Receiving Environment

The receiving environment is dominated by the existing railway corridor which passes through both urban and rural areas. The railway line runs parallel to the Royal Canal and is generally lined with managed and unmanaged verges, scrub, and hedgerows or treelines outside the urban areas. The railway corridor has areas of seminatural habitat along it which can provide a refuge for wildlife in an otherwise relatively managed landscape, however railway corridors can also act as corridors for the spread of invasive species, a source of pollution and can lead to direct impacts on species such as badger and otter.

Outside of the railway corridor, the proposed project is in a mix of suburban and rural areas. The habitats in these areas which may be impacted are hard standing in the form of existing roads and buildings, amenity grassland, agricultural grassland, woodland, parking as well as treelines and hedgerows. The new crossings will also require the Royal Canal to be bridged although no direct habitat loss is expected.

The proposed project will cross the Royal Canal, the Rye Water and a tributary of the River Liffey in Westmanstown as well as ditches and drains.

A number of designated sites occurs in the vicinity of the proposed project, including but not limited to the Rye Water Valley/Carton SAC [001398], South Dublin Bay and River Tolka Estuary SPA [004024], North Bull Island SPA [004006], Royal Canal pNHA [002103], the Rye Water/ Carton pNHA [001398], the Liffey Valley pNHA [000128], South Dublin Bay pNHA [000210] and the North Dublin Bay pNHA [000206].

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
- Spread of Invasive Alien Species (IAS)

8.5.2 Operational Impacts

- Direct Mortality (Trains, Cars and Powerlines; collision and barotrauma)
- Electro Magnetic Fields
- Habitat degradation (Noise, Lighting, Vibration, Visual)
- Ground water pollution
- Alteration of groundwater flow patterns
- Surface water pollution
- Impacts on designated sites

9. SOILS AND GEOLOGY

9.1 Introduction

This chapter outlines the relevant policy and guidance that will be consulted to carry out the soils and geology 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 soils and geology and for managing geotechnical risk during the construction and operational phases of the proposed project.

9.2 Legislation, Policy and Guidance

The NRA Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes 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 Soils and Geology, there are several topics presented in Table 9-1 which lists the relevant bodies and acts of legislation. These are grouped under sub-headings as 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. 457 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
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

Legislation	Government Bodies
Safety, Health & Welfare at Work (Quarries) Regulations 2008 The management of waste from extractive industries (2006/21/EC)	Health & Safety Authority Geological Survey Ireland
Geological Heritage Planning and Development Act, 2000 Planning and Development Regulations, 2001 Planning and Development (Amendment) Act 2010 Heritage Act, 1995 Wildlife Act, 1976 Wildlife (Amendment) Act, 2000	Department of Communications, Climate Action and Environment Department of Culture, Heritage and the Gaeltacht National Parks & Wildlife Service Local Authorities An Taisce The Heritage Council Fáilte Ireland

A complete listing of the legislations 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".

TII have also published standard DN-03083 Managing Geotechnical Risk, which outlines the steps required for a project to identify and mitigate geotechnical risks.

9.3 Methodology

The management of both risk and impact of the proposed project is implemented by identifying potential hazards, obtaining information and then reviewing the needs of design and construction. For the design of the proposed project it typically involves primary identification of soft ground which is unsuitable for construction, the availability and suitability of materials local to the route that can be used to build it and the need for a stable position in the surrounding environment.

9.3.1 Study Area

The study area will be defined consistent with the needs of the proposed project and its interface to include station modifications and the depot. A buffer of 200m is adequate in most places for the consideration of indirect impacts but a wider review will be made as some features may be present. The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix A

9.3.2 Surveys

A desk study review of the baseline environment has been undertaken to inform on the ground conditions present, including review of geologic mapping of the bedrock, of soils and subsoils. Surveys to be progressed include non-intrusive geophysical surveys and intrusive ground investigations. The objectives of these surveys are to obtain information on aspects such as the extent and depth of made ground, soft or loose alluvial soils and glacial tills as well as proving rock in many locations. This information will provide information on the conditions to the depth of foundations and beyond. This information will also be used for design and the management of geotechnical risk

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 soils and geology 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;
- An Taisce

9.4 Receiving Environment

The receiving environment is typically an urban or suburban setting, where made ground has been placed beforehand, generally at shallow depths over glacial soils that are close to surface. In some areas, rock is also near surface or exposed. The existing railway line is followed by the adjacent canal, with considerable differences in levels between the two at some locations and retaining lock-gate structures to manage the flow of water.

The existing level crossings are approached by narrow roads, with some development and occasional areas of open land. Alluvial deposits are present in limited instances and the vast majority of crossings are in across ground with some made ground, predominantly glacial till soils and bedrock at modest depths, generally 5m to 10m below ground.

The nearest geological heritage features include the Phoenix Park and Louisa Springs.

9.5 Potential Impacts

The most significant likely impacts of the proposed project is likely to be to the existing permanent way, canal and particularly where underpass or service diversions must be extended beneath them. Indirect impacts relate to the availability of resources to construct the proposed project and the potential need to dispose of unacceptable materials off-site. Remediation of previously contaminated areas along the permanent Way associated with the use of diesel trains may also be a positive effect.

10. HYDROLOGY

10.1 Introduction

This chapter outlines the relevant policy and guidance that will be consulted to carry out the hydrology 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 hydrology.

10.2 Legislation, Policy and Guidance

The assessment of hydrology 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 Statements (2002);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (2003);
- Draft EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, August 2017 (referred to where appropriate);
- Draft EPA Advice Notes for Preparing Environmental Impact Statements, September 2015;
- NRA 2009 Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- NRA 2008 Guidelines for the crossing of watercourses during the construction of National Road Schemes.
- OPW and DoEHLG 2009, 'Guidelines for Planning Authorities: The Planning System and Flood Risk Management'

10.3 Methodology

The hydrological impact assessment methodology will be undertaken as per Section 5.6 of the TII/NRA Guidelines pertaining to the treatment of Hydrology. 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 hydrological 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 development) 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 hydrological environment it is necessary to consider the larger river catchment environments that the proposed development traverses.

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

Ordnance Survey Ireland (OSi)

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

Environmental Protection Agency (EPA)

- Teagasc Subsoil Classification Mapping
- Water Quality Monitoring Database and Reports
- Water Framework Directive Status and Risk Classification
- 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
- OPW FSU (Flood Studies Update) Web Portal Site for Flood flow Estimation
- OPW Preliminary Flood Risk Assessment Mapping (pFRA).

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

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

National Parks and Wildlife Service (NPWS)

- Designated Areas Mapping
- Site Synopsis Reports

Other sources

- Aerial survey photography
- Geological Survey of Ireland (GSI) Web Mapping

10.3.1 Study Area

This proposed project covers a considerable geographical distance, traversing multiple discrete catchments, namely: the Liffey, The Tolka and the Royal Canal. The proposed study area for the assessment will as a minimum extend to 250m from the proposed developments 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 development) will be assessed. The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix A.

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 hydrological 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);
- Kildare County Council,
- Dublin City Council; and
- Fingal County Council.
- Meath County Council

10.4 Receiving Environment

10.4.1 Surface Waterbodies

The proposed project is located within the Liffey and Dublin Bay Hydrometric Area No. 09. This catchment includes the areas drained by the River Liffey and by all watercourses entering tidal water between Sea Mount and Sorrento Point, Co. Dublin. The total area of the Liffey and Dublin Bay Hydrometric Area is 1,616km^2.

10.4.2 Waterbody Status and Risk Classification

As part of the Water Framework Directive (WFD) implementation in Ireland, the EPA undertook an assessment of significant pressures on individual waterbodies and identified those that were “at risk” of not meeting WFD objectives. The second cycle of the River Basin Management Plan for Ireland (EPA 2018) sets out the planned programme of measures.

Subsequent to the Risk classification, waterbodies in Ireland were assigned a “Status” that reflects their ecological and chemical deviation from “pristine” waterbodies. The Status classification comprises a five-point scale ranging from “High” to “Bad”. An adjusted classification system is used for heavily modified or artificial waterbodies such as canals. This information is compiled by the EPA from sampling of representative points in the national monitoring network and the information is presented on the EPA websites (EPA Envision, Catchments.ie) and reported in Water Quality in Ireland 2013-2018 (EPA 2019).

The EPA interactive maps (https://gis.epa.ie/EPAMaps/) and EPA publications were used to identify the Status and Risk classifications of waterbodies within the study area. Waterbody Status and Risk Classification for natural watercourses are given in Table 10-1 below.

Table 10-1 Relevant Sub Catchments of the proposed development

Sub Catchment	Waterbody Status	Waterbody Risk Classification
Tolka_SC_020	Poor (Some reaches have unassigned status)	At Risk
Liffey_SC_100	Good (Some reaches have unassigned status)	At Risk
Liffey_SC_080	Poor – Good	At Risk
Lyreen_SC_010	Poor	At Risk
RyeWater_SC_010	Moderate	At Risk

The proposed development requires multiple crossings span the Royal Canal Way. As an artificial waterbody (AWB), the Royal Canal is subject to an adjusted classification system. Instead of good ecological status (GES), the environmental objective for AWB is good ecological potential (GEP). As of 2015, the Royal Canal has achieved Good Ecological Potential (EPA, Water Quality in Ireland 2010 – 2012).

10.4.3 Protected Sites

Natura 2000 sites comprise areas designated for bird species under the Birds Directive (Directive 2009/147/EC) and are classed as Special Protection Areas (SPAs), while those designated for other protected species and/or habitats are classed as Special Areas of Conservation (SACs) under the Habitats Directive (Directive 92/43/EEC).

Sites of national importance for nature conservation are afforded protection under planning policy and the Wildlife Act 1976 (as amended). Natural Heritage Areas (NHAs) are sites that are designated under the Wildlife Act for the protection of flora, fauna, habitats and geological features of interest. Proposed Natural Heritage Areas (pNHAs) are published sites identified as of similar conservation interest but have not been statutorily proposed or designated – pNHAs are nonetheless afforded some protection under planning policies and objectives.

Sites designated under the Natura 2000 and the Wildlife Act within the study area are listed in Table 10-2 below.

Table 10-2 Natura 2000 and Nationally Designated sites within the study area

Natura 2000 sites	Site Code
Rye Water Valley/Carton SAC	001398
Nationally Designated Sites	
Royal Canal pNHA	002103

10.4.4 Surface Waterbodies Connectivity to Natura 2000 Sites and Nationally Designated Sites

Watercourses within the subject area discharge to Dublin Bay which contains the following Natura 2000 sites listed in Table 10-3 below.

Table 10-3 Natura 2000 and Nationally Designated sites within or directly hydrologically connected to the study area

Natura 2000 sites	Site Code
South Dublin Bay and River Tolka Estuary SPA	004024
North Dublin Bay SAC	000206
South Dublin Bay SAC	000210
North Bull Island SPA	000206
Howth Head SAC	000202
Howth Head Coast SPA	004113
Rockabill to Dalkey Island SAC	003000
Nationally Designated Sites	
Liffey Valley pNHA	000128
North Dublin Bay	000206
South Dublin Bay	000210
Howth Head	000202
Dalkey Coastal Zone And Killiney Hill	001206

10.4.5 Flood Risk

The OPW's "floodinfo.ie" portal and County Development Plan SFRA's were reviewed for potential areas of increased flood risk within the subject area. Findings are discussed below.

10.4.5.1 Flood Risk Overview

Potential sources of flooding differ significantly through the study area. Dublin City Center lands have historically been subject to fluvial flooding from both the Liffey and the Tolka but also from tidal flooding propagating up their respective estuaries. Additionally, the urban area of north Dublin city has multiple minor watercourses that have been culverted as the city developed and have subsequently led to flooding through the drainage infrastructure.

Moving further west past the M50 motorway the flooding from the Liffey is mostly confined to a narrow valley. However, there appear to be multiple minor tributaries of the Liffey that cause out of bank flooding in extreme events. This can be seen within the vicinity of Leixlip where the Ryewater confluences with Liffey and directly south west of Maynooth where the Lyreen appears liable to flood a large area either site of the existing railway and Royal Canal. Further assessment of the receiving environment will be undertaken as part of the design studies and the EIAR.

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 dewatering, new drainage network or in-stream works; and
- Potential for localised flooding due to disrupting local drainage systems during construction works.

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.
- 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 sets out the methodology, provides a high level description of the receiving environment, and sets out the potential hydrogeological impacts.

11.2 Legislation, Policy and Guidance

The assessment of groundwater will consider the impact of construction and operation with regard to policy, plan and strategy documents, including (but not limited to) the documents listed in Chapter 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); and
- European Communities (Natural Habitats) Regulations 1997, (S.I. No. 94 of 1997) and European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011).
- 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:

- Assigning the importance of each hydrogeological attribute;
- 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.

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

- Identification of groundwater issues relevant to the components of the proposed project. These will consider the impact of dewatering on bedrock and overburden, water quality status, location of any drinking water supplies or groundwater dependent terrestrial ecosystems.
- Review of the receiving hydrogeological regime in the vicinity of the proposed project. A desk-based review of existing boreholes will be undertaken to identify viable monitoring points. The review shall include a gap analysis to identify additional monitoring well installation requirements having regard to the sensitivity of the environment along the proposed project. The additional monitoring wells will provide data to determine if the proposed project might have negative hydrogeologic impacts in sensitive areas.

- Assessment of potential impacts of construction and operation on receiving water quality and water levels by desktop study of available information.

The proposed Project will include the replacement of six existing at-grade level crossings with replacement bridges (5) and one tunnel structure (at Ashtown) to facilitate access, as appropriate. A geotechnical survey and desktop review of available information regarding bedrock and gravel aquifers will provide valuable lithological data. Potential impacts on groundwater from construction and operation activities may occur as a result of tunnelling at Ashtown as it may run beneath the Royal Canal and locally impact the hydrogeology. In addition to potential impacts at Ashtown a hydrogeological survey with an emphasis on potential groundwater impacts should be conducted in Clonsilla as this is another option for potential underground rail lines to be extended. 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 Environmental impact assessment will consider the project and propose mitigation measures to (i) manage any alkaline run-off due to concrete pouring, (ii) manage the design, installation, and maintenance of soil erosion and sedimentation control best management practices (BMPs) to mitigate stormwater run-off into Royal Canal and other nearby water bodies, (iii) manage impacts of tunnelling or excavations on groundwater and (iv) manage impacts of dewatering on the groundwater water flow regime.

11.3.1 Study Area

The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix A. The land use along the eastern end of the Project is predominantly urban and suburban from the Spencer Docks to Leixlip. The area immediately surrounding the Spencer Docks is primarily brownfield sites and changes to a mix of residential and commercial sites with some greenfield areas as the line moves towards the suburban areas. North of the Project on the west side of Leixlip is the Collinstown Industrial Park consisting of several large industrial buildings within the complex. West of Leixlip the Project becomes more rural as it moves west beyond Leixlip to Maynooth as the rail line runs parallel to the Royal Canal. There are primarily greenfield sites along the rural end of the line between Leixlip to Maynooth with a mixture of farmland and residential sites immediately adjacent to the project.

The proposed project area includes the electrification of the existing Maynooth Line from the city centre at Connolly Station and the Docklands areas/ Spencer Dock to west of Maynooth and to the M3 Parkway. There will be 5 existing level crossings which are proposed to be replaced with bridges and a tunnel at Ashtown which will extend under the permanent way and Royal Canal. The Maynooth Line runs parallel and within relatively proximity to the Royal Canal throughout the entirety of the section of railway. The area is dominated by urban and suburban settings with a mixture of residential, commercial, and industrial land uses along the course of the route. In addition, there are a number of green spaces located adjacent to the railway.

The proposed project runs across the Dublin Ground Water Body (GWB) as listed in the EPA's Special Areas of Conservation (SAC) GWB map. A review of the Geological Survey Ireland (GSI) describes the general hydrogeology of the Project area as being within the Dublin GWB is composed of moderate permeability karstified limestone. Very small areas of low permeability impure limestones are incorporated with this GWB, since they are isolated and do not significantly alter the flow system. The boundaries of this GWB are defined to the south by the contact with the Granites and Lower Paleozoic rocks, to the west and north by the extent of the Liffey catchment to the east by the coast. Groundwater flow occurs along fractures, joints and major faults. The aquifers within the GWB are generally unconfined but may become locally confined where the subsoil is thicker and/or lower permeability. Most groundwater flow will take place close to the surface with additional isolated flow along fractures and fissures located at depths up to 50 m.b.g.l.

The lithology in the Dublin GWB is comprised of a number of types of subsoils and their distribution relates to their deposition from ice flow directions during the last ice age. Irish Sea Tills are commonly found along the coast and inland for some distance and are typically the least permeable of the subsoils found in the area. Much of the aquifer is overlain by limestone-derived till which came from the limestone expanses around Dublin. There are smaller gravel deposits in the area, which will be the most permeable of the subsoils, including glacial deposits and alluvial gravels. The thickness of the subsoils vary throughout the area with greater thickness, up to 10 meters, found along the coast and becoming more reduced in thickness inland.

The proposed project will cross the Royal Canal, the Rye Water and a tributary of the River Liffey in Westmanstown as well as numerous ditches and drains along the length of the project.

11.3.2 Surveys

Ground investigation (GI) surveys are taking place that will inform all infrastructural elements of the project. During the GI works hydrogeological assessment surveys may be recommended in particular areas to include pump tests in areas with perched aquifers, hydraulic conductivity of soils, groundwater flow regime, and impacts on sustainable drainage systems (SuDS). All relevant and available survey data will be used to inform the baseline environment. Given the history of discharges along the rail line there is the possibility that hydrogeological impacts already exist, and additional surveys may be required to determine if similar conditions exist prior to the start of any construction or ground disturbance activities.

Geotechnical surveys may also include the installation of monitoring wells and soil borings in areas of concern as determined by the desktop survey and review of existing information. Information derived from the surveys will be used to assist in determining if any hydrogeologic impacts will result as an effect of construction or operation of the project.

A review of desktop information relating to drinking water wells currently in use within a one-kilometre radius of the project area will be conducted to determine if the proposed project activities may result in impacts on drinking water supplies.

11.3.3 Consultation

The development of the environmental impact assessment 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;
- Environmental Protection Agency (EPA).

11.4 Receiving Environment

The proposed project areas are within close proximity to the Royal Canal and as a result could impact the water body through the potential localized changes in groundwater flow and/or discharge. The receiving bodies within the project area are local shallow aquifers, soils, and surface water bodies which run throughout the extent of the project area. Sections of the project area shift from urban areas consisting of made ground and vulnerable groundwater bodies to more rural areas with a mixture of alluvial and glacial till which are less vulnerable to impacts due to low-density development.

Groundwater vulnerability throughout the Project area ranges from low vulnerability to extreme vulnerability. Low and moderate groundwater vulnerability areas extend from Spencer Dock west along the rail line until approximately Ashtown. Groundwater vulnerability becomes high to extreme from Ashtown west to the split

of the rail line west of Clonsilla with localized areas of bedrock near the surface. Vulnerability is reduced to moderate from the split west of Clonsilla to just west of the R449 and R148 intersection where it becomes highly vulnerable to just east of Maynooth with small localized areas of extreme vulnerability and bedrock near the surface on the northside of Maynooth.

According to the GSI soils throughout the Project vary widely between made land, alluvial, and gravel soil. The majority of made soils are located in the Docklands area of the Project and extending west to west side of the R805 bridge which crosses the Royal Canal. Additional areas of made land include the area west of the N3 and M50 intersection at Castleknock west to Coolmine, around the Leixlip area including the Leixlip Confey and Leixlip Louisa bridges and throughout the majority of Maynooth. Carboniferous limestone till are located in the area east of the N3 and M50 intersection to the R805 bridge across the Royal Canal. Areas south of Clonsilla to the split of the rail line consist of carboniferous limestone till and bedrock at or close to the surface with some undifferentiated alluvium. Soils located near the Rye Water are listed as carboniferous limestone and glaciofluvial sands and gravels with a mix of undifferentiated alluvium and limestone till. On the west and eastern sides of Maynooth soils are generally limestone till with small areas of glaciolacustrine sediments and deposits.

Several surface water bodies run in close proximity to or intersect the proposed project ranging from small streams to rivers. The Tolka River runs north parallel to the Project from the Docklands to the N3 and M50 interchange and ranges from approximately 300 meters to 900 meters distant. The closest the Tolka River comes to the Project is from the R805 bridge west to the N3 and M50 interchange which is approximately 300 meters distant. According to the River Network EPA map a small stream designated as Rusk runs west to east across the Project just north of the Westmanstown Sports and Conference Centre. No other streams were noted in the desktop review that intersect the Project. The Rye Water intersects the Project just north of the Leixlip Louisa Bridge and then runs parallel west to east north of the Project until Maynooth ranging from approximately 400 meters to 800 meters distant. The River Lyreen crosses the Project area just west of Maynooth.

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:

- Alteration in groundwater flow patterns during dewatering activities;
- 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;
- Potential for discharges of contaminated water from tunnelling and or station excavations.

11.5.2 Operational Impacts

During the operational phase, the potential for impact of the ground water regime may vary throughout the length of the project area based upon current hydrogeological features which include Rye Water and River Lyreen and areas in which bedrock is at or near the surface. The proposed depot station at Maynooth and the proposed Spencer Dock station may impact the local hydrogeology due to the removal of existing soils which could impact groundwater flow, transmission, and hydraulic conductivity in the localised areas. During

the operational phase it is not likely that there will be direct discharges to groundwater as only minimal areas will encounter groundwater in areas with either lowering existing tracks or bore-tunnelling in urban 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 chapter 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 EIA. This chapter will address both the positive and negative effects of the proposed scheme. 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 (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 20019); 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 2002, 2003, 2017) 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). Transport Infrastructure Ireland 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.

In addition to traffic impacts due to changes in level crossings, the impact due to emissions to atmosphere associated with the scheme from the operation of the proposed railway line will include particulates (PM_{10} and $PM_{2.5}$) and nitrogen oxides (NO_2 and NO_X).

The assessment methodology for railway emissions involved air dispersion modelling using the United States Environmental Protection Agency (USEPA) new generation dispersion model AERMOD (USEPA, 2019) as recommended by the and Irish EPA (2020). The model is a steady-state Gaussian plume model used to assess pollutant concentrations associated with a range of sources including emissions from non-electric rail stock.

Assessment Criteria for the impact of dust during the construction 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 development 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 2018 Report and previous reports (2013 – 2018);
- Dublin Regional Air Quality Management Plan 2009-2012;
- National Parks and Wildlife Service Maps; and
- Environmental Protection Agency – Integrated Pollution Control 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 the Environmental Impact Statement (EPA, 2002) and will follow all future revisions or finalised EIA guidelines as appropriate (draft revised EPA guidelines on EIAR were published in 2017);
- 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 scheme will include the following elements:

- Review of standards and legislation;
- Identification of air quality issues relevant to the components of the proposed Scheme;
- Review of background ambient air quality in the vicinity of the proposed Scheme (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 scheme. 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);
- Hospitals and nursing homes; and
- Offices or Shops.

A series of mitigation measures to minimise any foreseen impacts for both the construction phase and operational phase of the project will be proposed as required as part of the EIAR.

12.3.1 Study Area

This study area covers a considerable geographical area and in close proximity to both a sizeable urban area containing sensitive residential receptors as well as ecological sensitive areas. It is determined that the scheme will require appropriate assessment of the degree of sensitivity of the siting and design (i.e. sensitivity of surroundings) of proposed infrastructure associated with the proposed project. It is expected that there will be sensitive residential receptors located within 200m of the aforementioned elements.

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 5%). This study area is the same for designated area 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 (>5%) occur.

12.3.2 Surveys

In addition to EPA baseline data, a three-month monitoring assessment of NO_2 will be conducted. Monitoring of NO_2 in proximity to the proposed project will be carried out using passive diffusion. In order to assess the spatial variation in NO_2 levels along the length of the proposed Maynooth and M3 Parkway lines, NO_2 will be monitored using passive diffusion tubes over successive one-month periods at 18 locations (plus 2 blanks and triplicate at co location station). Passive sampling of NO_2 involves the molecular diffusion of NO_2 molecules through a polycarbonate tube and their subsequent adsorption onto a stainless-steel disc coated with triethanolamine. Following sampling, the tubes will be analysed using UV spectrophotometry, at a UKAS accredited laboratory (SOCOTEC laboratories, Burton-on-Trent). The diffusion tube locations are to be strategically positioned to allow an assessment of background levels and typical exposure of the residential population along the length of the proposed scheme. The passive diffusion tube results allow an indicative comparison with the annual average limit value.

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)
- 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 development 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 scheme with the highest concentrations predicted to be in proximity to the most easterly 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 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 (PM_{10} and $PM_{2.5}$), benzene, nitrogen oxides (NO_x) and CO. 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 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.

12.5.2 Operational Impacts

The overall operational impacts from the DART+ West 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.

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 and rail 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) states 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 operation of the proposed railway line will include particulates (PM_{10} and $PM_{2.5}$) 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 (both adverse and beneficial) on sensitive receptors, within 200m of the proposed project.

13. CLIMATE

13.1 Introduction

This chapter 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 EIA. This chapter will address both the positive and negative effects of the proposed scheme. 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 2019), 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);
- CCAE (2013) Climate Action and Low Carbon Development – National Policy Position Ireland;
- DCCAE (2017) National Mitigation Plan: July 2017;
- Government of Ireland (2019) Climate Action Plan;
- TII (2011) Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes; and
- Local Authority climate and planning guidance:
- The Kildare County Council Climate Change Adaption Strategy 2019-2024;
- 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 the Environmental Impact Statement (EPA, 2002) and will follow all future revisions or finalised EIA guidelines as appropriate (draft revised EPA guidelines on EIS were published in 2017);
- 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); 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 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 scheme;
- Review of baseline GHG emissions;
- Assessment of potential impacts emissions to the atmosphere from the operation of the proposed railway line;
- Assessment of potential impacts of 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 shall include 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);
- 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 2020 (EPA, 2020) predicts that Ireland will exceed its 2018 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by 5.59 Mt. For 2018, total national greenhouse gas emissions are estimated to be 60.93 million tonnes carbon dioxide equivalent (Mt CO_2eq). This is 0.1% lower (0.07 Mt CO_2eq) than emissions in 2017.

Greenhouse gas emissions from the Transport sector increased by 1.6% or 0.20 Mt CO_2eq in 2018. This is the fifth year out of the last six with increased emissions in transport. Private diesel cars increased by 7.7% in 2018 while the number of passenger petrol cars decreased by 4.5%. Railways contributed 130.49 kt CO_2eq in 2018 or 0.2% of total emissions. This was up 1% on 2017 emissions. Road transportation accounted for 11,677 kt CO_2eq which is 19.2% of the total 2018 emissions.

Energy production using fossil fuels is continually decreasing in recent years with renewable energy production increasing. There was a 10.7% decrease in emissions related to energy generation, this can be attributable to decreases in consumption of coal and peat by 43.7% and 3.4 % respectively. There was an increase in biomass and non-renewable waste, due to the new waste to energy facility in Dublin operating at full capacity in 2018. I n 2018 renewable energy accounted for 33.0% of electricity generated in 2018 (up from 29.0% in 2017).

Several important changes to legislation have been enacted including the Climate Action Plan 2019 and the Draft General Scheme of the Climate Action (Amendment) Bill 2019 (in January 2020), 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 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 EIARs. 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, removal of existing material and road pavement construction 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.

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 potential level crossing alterations may impact on GHG emissions from road vehicles, however this will depend on the impact that these changes have on journey length, road congestion and speeds. The magnitude of change of GHG emission will be determined as part of compilation of the EIAR for the proposed project.

The proposed project will assist the Climate Action Plan to implement major sustainable-mobility projects to increase the use public transport in major cities in Ireland by 50%.

14. NOISE AND VIBRATION

14.1 Introduction

This chapter 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 chapter will address both the positive and negative effects of the proposed scheme. 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) Rev 0;
- The Department of Transport (UK): Calculation of Railway Noise (CRN). 1996.
- The Department of Transport (UK): Calculation of Road Traffic Noise (CRTN). 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 (2004);
- BS 6472-1: Guide to Evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting'. (2008)
- British Standard BS7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;
- BS8233: Guidance on Sound Insulation and Noise Reduction for Buildings – Code of Practice. (2014)
- BS4142: Method for Rating and Assessing Industrial and Commercial Sound. (2014+A1:2019)
- Dublin Agglomeration Environmental Noise Action Plan (2018 – 2023)
- ISO 9613: Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation. (1996)
- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002)
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003)
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015)
- World Health Organisation (WHO): Environmental Noise Guidelines for the European Region (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 Maynooth 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 Maynooth will assessed in accordance with best practice.
- Cumulative noise and vibration impacts associated with all new and existing fleet serving the Dublin and Maynooth line will be assessed.
- An assessment of the noise impacts associated with the modifications to Connolly and Docklands/Spencer Dock Stations as well as the construction of a new rail depot will be assessed;
- An assessment of the noise impacts associated with road realignments and road closures in the vicinity of the affected level crossings has been undertaken in accordance with best practice.
- 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 Maynooth and M3 Parkway. 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 park and ride sites, 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.

For both the construction and operational phases, this 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 baseline 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.

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

A series of vibration monitoring surveys will be conducted in the vicinity of residential, commercial and amenity areas along the proposed project in order to assess current levels of vibration associated with the operation of the rail line prior to commencement of any works.

Similar to the baseline noise survey detailed above, two sets of vibration monitoring surveys will be undertaken using attended and unattended monitoring periods.

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 where there are interchanges and junctions with the road network 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 this phase. In particular the following construction activities are likely to produce the highest impacts:

- Electrification of Rail Line
  - It is expected that the electrification of the rail line will result in negative moderate to very significant impacts to local residential receptors due to the potential for works to be carried out during the night period which is considered to be the most sensitive time for construction works. Notwithstanding this, the duration of the impact is expected to be temporary in nature and therefore will be limited as the works move along the rail track.
- Level Crossings
  - The removal of level crossings and subsequent construction of various foot and vehicular bridges will likely give rise to high levels of construction noise in their respective locations. Due to the close proximity of the works to the rail tracks it is likely that a portion will be undertaken during the evening and night hours.
  - Given the proximity of the works to noise sensitive receptors, the nature of the construction works, the potential for works taking place outside of daytime hours and the duration of the construction works at each location, it's expected that a moderate to significant noise impact will likely occur. Notwithstanding this, the duration of the impact is expected to be temporary in nature and therefore will be limited as the works progress at different work sites.
  - Construction of Depot and Expansion to Existing Stations
  - Given the proximity of the works to noise sensitive receptors, the nature of the construction works, the potential for works taking place outside of daytime hours and the duration of the construction works at each location, it's expected that a significant noise impact will likely occur.

14.5.2 Operational Impacts

- Rail Traffic - Noise
  - The current and upgraded rail line will be modelled using a propriety 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, albeit not a significant increase.
- 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 of which results will be assessed through a change in noise level for existing routes or compared with national guideline values for new routes.
  - Typically a change in traffic volumes of 25% will result in a change in noise level of 1 dB, which can be deemed insignificant. A change in traffic volume of 100% will result in a change in noise level of 3 dB which can be considered just perceptible. Consequently, a large change in traffic volume is required for a significant impact to be predicted.

- Rail Depot and Station Expansion
  - Operational noise levels for the stations and depot will be calculated for the nearest sensitive receptors taking account the expected activities at each location. Source noise levels for activities and sources will be derived making reference to published data and data sets from other projects. The likely level of noise emissions from the proposed project will be predicted in accordance with standard guidance.

15. LANDSCAPE AND VISUAL

15.1 Introduction

This chapter 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 assessment of the landscape and visual effects 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 2016-2022, Dublin City Council, 2016.
- Fingal Development Plan 2017-2023, Fingal County Council, 2017.
- Kildare County Development Plan 2017-2023, Kildare County Council, 2017.
- Guidelines on the Information to be Contained in Environmental Impact Statements, Environmental Protection Agency, 2002 and Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2017.
- 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

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*, Draft 2017, EPA) 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 removal of existing at-grade rail crossings at Ashtown, Coolmine, Clonsilla, Porterstown, Barberstown and Blakestown (County Kildare) and associated proposed new road and pedestrian/cycle access works where appropriate;
- 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 Maynooth.
- Determination of the direct and indirect, construction and operation stage, landscape and visual effects of the proposed modifications to Connolly and Docklands / Spencer Dock rail stations as well as that of the proposed new rail 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 scheme 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 area s 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, Kildare County Council and Meath County Council and with Inland Waterways.

15.4 Receiving Environment

The proposed project follows the parallel corridors of the existing Dublin City to Maynooth Railway and the adjoining Royal Canal, 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, and the Royal Canal corridor 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, and the Royal Canal corridor adjoin or are located close to the proposed project and as such, it is predicted that significant landscape and visual effects will arise, most notably from new road works associated with the removal of the existing at-grade rail crossings at Ashtown, Coolmine, Clonsilla, Porterstown, Barberstown and Blakestown.

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, including the Royal canal, 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.

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, including the Royal canal, from new elevated structures, bridges, embankments, retaining walls, fences, barriers, gantries;
- Visual intrusion on properties and amenities, including the Royal canal, 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 chapter 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 (Draft) (EPA, 2017)
- Advice Notes for Preparing Environmental Impact Statements (Draft), (EPA, 2015)
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003)
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002)

16.3 Methodology

The methodology for the assessment of the impact on agriculture 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.
- Roadside survey of the proposed level crossings and rail depot 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 level crossings and new rail depot. 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.
- 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 level crossings and new rail depot.

16.3.2 Surveys

The methodology for the agricultural property assessment will include roadside surveys and agricultural property landowner surveys. 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 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 level crossings and new rail depot.

16.5 Potential Impacts

16.5.1 Construction Impacts

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

- Level crossings & rail depot – 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.
- Level crossings & rail depot – Temporary impact on access to lands;
  - Any impact on access to lands will result in disturbance of farming operations.
- Level crossings & rail depot – 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.

16.5.2 Operational Impacts

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

- Level crossings & rail depot – 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.
- Level crossings & rail depot – 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 disturbance of farming operations due to increased travel journey times.

17. MATERIAL ASSETS: NON-AGRICULTURAL PROPERTIES

17.1 Introduction

This chapter 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 (Draft) (EPA, 2017)
- Advice Notes for Preparing Environmental Impact Statements (Draft), (EPA, 2015)
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003)
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002)

17.3 Methodology

The methodology for the assessment of the impact on 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 the proposed level crossings, station extensions, new rail depot study area and any other associated 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 level crossings, station extensions, new rail depot and any other associated 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.
- 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 level crossings, station extensions, new rail depot, 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. 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 be carried out during the assessment and feedback from this process deemed relevant to non-agricultural property will be considered.

17.4 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.

17.5 Potential Impacts

17.5.1 Construction Impacts

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

- Level crossings, substations, station extension & rail depot – Noise, Vibration & Dust;
  - These indirect impacts will be a source of disturbance on non-agricultural properties and, in particular, on residential properties.
- Level crossings, substations, station extension & rail depot – Temporary impact on property access;
  - Any impact on access to properties will result in disturbance.
- Level crossings, substations, station extension & rail depot – Disturbance of property 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.

17.5.2 Operational Impacts

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

- Level crossings. substations, station extensions & new rail depot – Landtake;
  - The acquisition of non-agricultural property, curtilage or lands may have very significant impacts on non-agricultural properties.
- Level crossings. substations, station extensions & new rail depot – Permanent impact on property access;
  - Permanent impact on property access may have significant impact on the non-agricultural properties.

18. MATERIAL ASSETS: UTILITIES

18.1 Introduction

This chapter 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 Chapter 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 highlighted above, 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 Chapter 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 the construction and operation of the proposed project. 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. Receiving Environment

18.4 Receiving environment

Due to the nature of this built up area there are extensive utilities present in the area to include as a minimum:

- Electricity – ESB underground MV / LV ducts;
- 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 diversion and diversions on existing transport infrastructure.

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.
- Additional electrical connections
- Maintenance depot will require water supplies and sewage connections

19. MATERIAL ASSETS: WASTE MANAGEMENT

19.1 Introduction

This chapter describes the scope of work and methods to be applied in the identification and assessment of impacts with regards to 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 Chapter 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); and
- National Hazardous Waste Management Plan 2014- 2020 (EPA 2014b)
- Relevant County Development Plans
- Relevant Local Area Plans

19.3 Methodology

It is proposed that an assessment of 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 2017a);
- 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 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

19.3.1 Study Area

The study area for the purposes of 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, 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.
- Surplus materials and waste may occur where material supply exceeds material demand.

19.5.2 Operational Impacts

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

20. ARCHAEOLOGY AND CULTURAL HERITAGE

20.1 Introduction

This chapter 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 Acts 2000 to 2017
- Heritage Act, 1995, as amended
- Guidelines on the information to be contained in Environmental Impact Statements, 2003, EPA
- 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 (Draft August 2017), EPA
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands
- 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 Counties Kildare, Meath and Dublin;
- Sites and Monuments Record for Counties Kildare, Meath and Dublin;
- 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;
- Excavations Bulletin (1970-2019)

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 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 development 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. The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix.

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 Culture, Heritage and the Gaeltacht, along with the relevant local authorities for Counties Kildare, 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; suburbs such as Maynooth and Leixlip and more open agricultural landscapes within portions of Counties Fingal, Kildare and Meath. There are seven individual or groups of recorded monuments within the receiving environment in County Dublin; 15 within the receiving environment in County Kildare and two in County Meath. None of these sites are listed as National Monuments or are sites that possess Preservation Orders.

Of the recorded monuments in Dublin, these include a small section of the Zone of Archaeological Potential that surrounds the historic core of the City (RMP DU018-020), along with North Quay (RMP DU018-020564). A bridge and weir site are recorded on the edge of city centre (RMP DU018-022001/2). Within County Fingal two Bronze Age ring ditches or barrows are recorded (RMP DU013-018, DU013-047) along with an early medieval burial ground (RMP DU014-095) and a medieval church and graveyard at Clonsilla (RMP DU013-017001-3).

Of the monuments recorded in County Kildare, four are listed within the Sites and Monuments Record only, as they represent a record of sites that have already been subject to excavation (SMR KD011-053, 055, 056 and KD005-024). The remainder consist of a number of early medieval or medieval ecclesiastical sites (RMP KD006-001, KD011-007, KD006-005001-3, KD005-009001 and KD005-002); two early medieval secular sites

(RMP KD006-006, 012); two Bronze Age ring ditches (RMP KD005-033, 003) and a 17th century house (RMP KD005-004).

The sites in County Meath consists of a large enclosure and ring ditch (RMP ME050-032001-2) and a single ring ditch (RMP ME050-031).

The closest monuments to the existing railway infrastructure consist of the site of a barrow, located within the townland of Maws, County Kildare (RMP KD005-033), which is located c. 5m southwest of the existing railway and a group of ring barrows in Kellystown, County Dublin, also located within 5m of the existing railway (DU013-018).

Sites that are be considered to represent cultural heritage assets specifically relate to the Royal Canal and 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

- It is possible that the construction of the proposed development will results in a significant negative impact on a recorded barrow, located within the townland of Maws, County Kildare (RMP KD005-033). The potential negative impact will be removed with the provision of archaeological mitigation in the form of predevelopment investigations and excavations during construction.
- 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, dependant 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 and Royal Canal 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.

20.5.2 Operational Impacts

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

21. ARCHITECTUAL HERITAGE

21.1 Introduction

This chapter 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
- Guidelines on the information to be contained in Environmental Impact Statements, 2003, EPA
- 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 (Draft August 2017), EPA
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000
- 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 Counties Kildare, Meath, Fingal and Dublin City;
- National Inventory of Architectural Heritage for Counties Kildare, Meath, Fingal and Dublin City;
- Cartographic and written sources relating to the study area;
- 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 development 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. The location plan of the proposed project is shown in drawing MAY-MDC-ENV-ROUT-DR-V-0001 : Location Plan of Appendix A.

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 Culture, Heritage and the Gaeltacht, along with the relevant local authorities for Counties Kildare, Meath, Dublin City and Fingal County will be consulted during the development of the proposed scheme and the preparation of the EIAR.

21.4 Receiving Environment

The receiving environmental of the proposed project is formed by a variety of landscapes, including the urban core of Dublin City; suburbs such as Maynooth and Leixlip and more open agricultural landscapes within portions of Counties Fingal, Kildare and Meath. There are over 50 groups or individual structures listed within the RPS and NIAH within Dublin City. These, for the most part, represent houses within the city centre; however, a large number of buildings associated with the Royal Canal, such as the locks and the road bridges are also protected. There are also four former demesne landscapes within the study area, in Dublin City, but these have lost their original designed characteristics and now contain either residential or commercial development.

There are 26 groups or individual structures within County Fingal, which are listed within the RPS and the NIAH. These buildings include bridges across the Royal Canal as well as a number of larger houses within the wider landscape that are associated with a demesne. The Royal Canal itself, where it runs through Fingal, is listed as a protected structure. There are 11 demesne landscapes within the study area in County Fingal. Many of these survive in good condition and the landscape associated with Lutrellstown Castle is also designated as an Architectural Conservation Area (ACA).

There are 29 groups or individual structures within County Kildare, which are listed within the RPS and the NIAH. A large portion of these are associated with the settlements of Kilcock and Maynooth, although a number of bridges associated with the Royal Canal and railway are also listed. The study area includes a portion of the ACA that defines the centre of Maynooth and part of the ACA that surrounds the centre of Kilcock. There are four demesne landscapes within the study area of the proposed scheme in County Kildare. The most significant of these is the landscape that was established in association with Carton. The railway, Royal Canal and existing R148 run along the southern boundary of this demesne.

There are no protected structures or within the study area of the proposed development where it runs through County Meath. Two structures are included in the NIAH survey, which comprise a water tower (NIAH reference 14341001) and railway bridge at Dunboyne (NIAH reference 14341002).

21.5 Potential Impacts

21.5.1 Construction Impacts

- It is possible that works associated with the closure of the existing level crossings and the electrification of the railway line, may have a direct significant negative impact on protected structures associated with both the railway and canal. These include bridges over the canal and railway as well as built infrastructure associated with the level crossings themselves.
- Works associated with the proposed scheme may have a direct and significant negative impact on demesne landscapes and associated features, such as boundaries and gate lodges, where they are located in close proximity to the existing railway line.
- No significant impacts are predicted on any ACAs within the overall study area.

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. ELECTROMAGENTIC COMPATIBILITY & STRAY CURRENT

22.1 Introduction

This chapter 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.

Electromagnetic Fields (EMF) comprise 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 includes 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 EIA:

- Local residents and the community
- Domestic and industrial electrical equipment
- Telecommunications infrastructure (including wireless radio services)
- Sensitive medical and research equipment; and
- Utilities
- 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
- 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

Extensive investigations and assessments were undertaken to inform the EIA for the previously proposed electrification of the Maynooth line in 2011. Much of the baseline will have remained unchanged since then, and as such some of the previously gathered information is of use for the current proposed design. This 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.

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 Statements (EPA 2002)
- Draft Guidelines on the information to be contained in Environmental Impact Assessment reports (EPA 2017)
- 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.

However, due to the potential for extremely sensitive equipment used in medical, research or manufacturing facilities the corridor of influence is extended to 100m. Table 22-1 lists the study area either side of the alignment:

Table 22-1 The study area either side of the alignment

Criteria	Width of Study Area (on both sides of the alignment)
Potential impacts from Direct Current (DC) fields	100 m
Potential impacts from Alternating Current (AC) fields	10 m
Potential impacts from Radiofrequency (RF) and microwave fields	100 m
Potential impacts from stray currents	100 m

22.3.2 Surveys

Current knowledge of potentially sensitive receptors along the proposed route coupled with feedback from consultation with stakeholders and the results of the desktop study will be used to identify those locations where baseline surveys of the electromagnetic spectrum will be carried out. Locations of the main traction substations will also be chosen as survey sites with respect to covering the guidelines for exposure to EMF. Depending on the layout of a particular site stakeholder engagement may be necessary on the day of each survey in relation to site access. The surveys' results will also be used to identify any electromagnetic signals present in the environment that may not be accounted for already and which may signify other equipment the needs to be considered from an EMI perspective.

22.3.3 Consultation

Consultation will be undertaken with some of the larger 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. No sensitive research or medical facilities have been identified within the study area with the exception of Intel in Lexlip, with whom consultations will be required.

22.5 Potential Impacts

22.5.1 Construction Impacts

During construction no large-scale electrical installation 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 from 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.

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 radiofrequency (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 will be gradual rather than a step change.

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 chapter 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 EIA will require a comprehensive policy, plan and strategy review, including (but not limited to) the documents listed in Chapter 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 EIA 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 2014a);
- 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) (HAS 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)
- 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 2017'*, there were no major accidents or fatalities recorded in 2016 (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 2006 to 2015. With respect to road safety, Ireland is currently ranked 4th safest EU country and is targeting a further 22% reduction in road deaths by 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 2018). The most recent of these was published in 2018 and provides statistics for the period of 2016-2017. In 2017, the construction sector reported the second highest number of fatalities after the agriculture, forestry and fishing sector, with six fatalities recorded. Since 2010, there have been 65 fatalities recorded in the construction sector.

With respect to Ireland's safety and security, the threat of terrorism is categorised as possible but unlikely. Ireland is ranked 10th place on the Global Peace Index 2018, and 6th in Europe. This is an annual ranking of 163 independent states and territories based on 23 qualitative and quantitative indicators including relations with neighbouring countries, role in conflicts, political instability, level of perceived criminality, level of violent crime, impact of terrorism, and ease of access to small arms.

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 and Fingal

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 including from impacts on the canal;
- 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;
- Impacts on the canal and potential for dewatering or pollution during construction; and
- Potential for railway closures due to construction of structures beneath the existing railway line.

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 AND 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 2017) define cumulative impacts as: *'The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.'*

This chapter 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);
- 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 Draft August 2017, EPA;
- Planning Inspectorate, (2019). Advice Note 17: Cumulative Effects Assessment relevant to nationally significant infrastructure projects.
- 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 with assessing the interactions and cumulative impacts. The main aspect of cumulative effects assessment relates to the assessment of relevant plans and projects.

- Cumulative assessment of plans
- Cumulative assessment of 'active' and granted projects
- 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 development will be considered as part of the EIA.

The cumulative assessment of projects will consider all active and granted planning applications within 300m of 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. BusConnnects, 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 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, Kildare County Council and Meath County Council;
- Waterways Ireland;
- National Transport Authority (NTA) including the new Park and Ride Development Office;
- Transport Infrastructure Ireland (TII);
- Iarnród Éireann including the Network Enhancement Department; and
- An Bord Pleanála.

Further details of consultation can be found in Chapter 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;
- Several developments with insignificant impacts individually but which together have a cumulative effect, e.g. development of a golf course may have an insignificant impact, but when considered with several nearby golf courses there could be a significant cumulative impact on local ecology and landscape.

25. CONCLUSION

This Informal EIA Scoping report has presented the proposed project, scope and level of detail that will be contained in the Environmental Impact Assessment Report (EIAR) which will be prepared for the proposed project. The EIAR will present the findings of the environmental assessments as required by the EIA Directive and will accompany the Railway Order Application to An Bord Pleanála.

A Flood Risk Assessment and an Appropriate Assessment Screening will also be undertaken. The results of the AA Screening will inform whether a Natura Impact Assessment (NIS) will be required for the project.

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

- Is the scope and level of detail of the proposed 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?

This EIA Scoping is subject to a period of statutory consultation. 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 made to IÉ within 6 weeks from the date of this scoping notice. Please send submissions or observations marked '**DART+ West – EIA Scoping Consultation'** in writing to the addresses (email or hard copy) below:

To make a submission please use the following contact details:

Subject:	**DART+ West – EIA Scoping Consultation**
Email:	DARTWest@irishrail.ie
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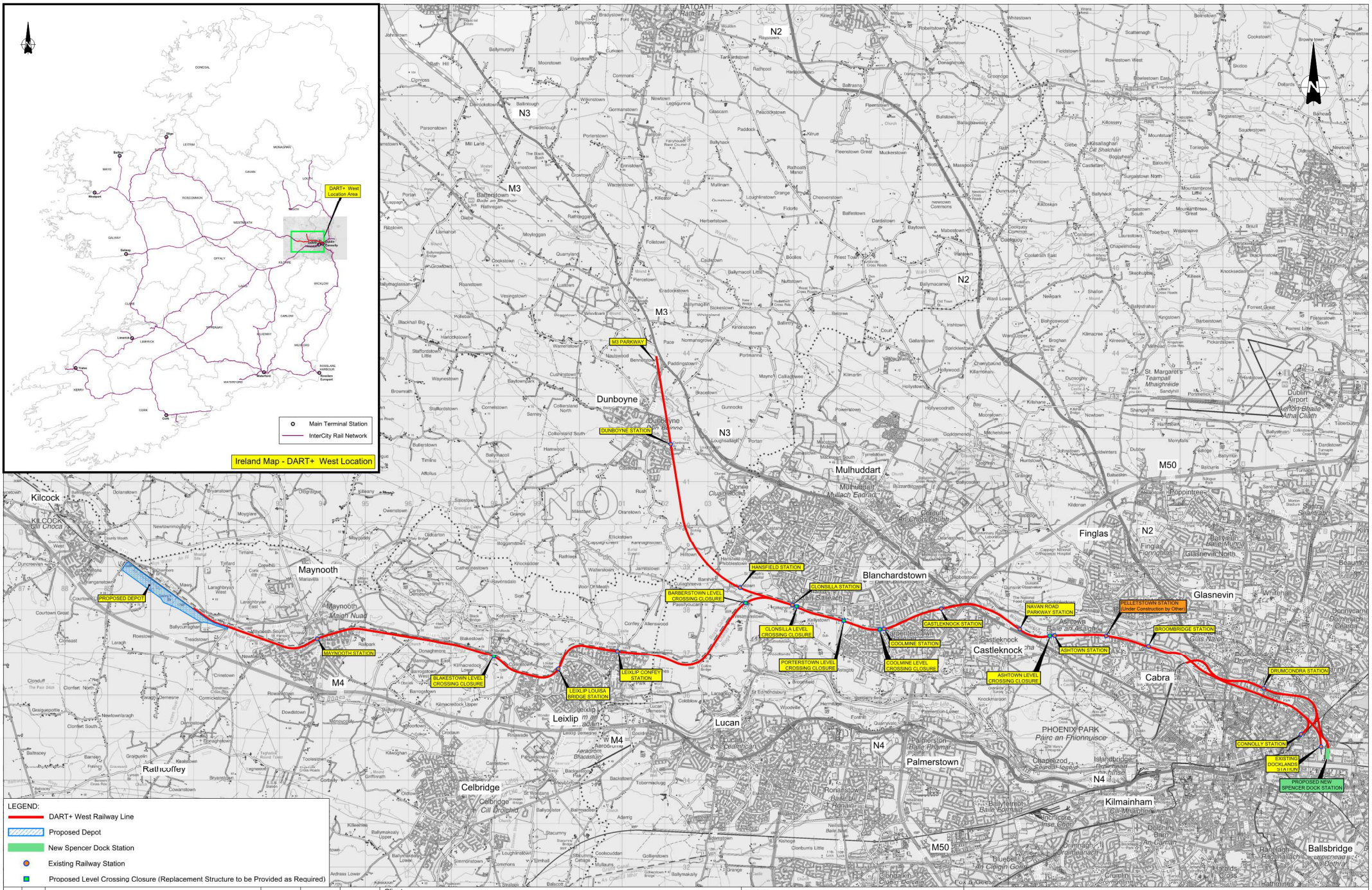
Appendix A



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Client: Tionscadal Éireann Project Ireland 2040 | NTA | Iarnród Éireann Irish Rail | CIE | Transport for Ireland

Consultant: IDOM | CS | ROD Roughan & O'Donovan

Project: DART+ West

Drawing Title: DART+ West Location Plan

Drawing Number	Project	Originator	Discipline	Location	Type	Role	Number	Drawn By	Checked By	Reviewed By	Approved By
	MAY	MDC	ENV	ROUT	DR	V	0001	KH	FOK	BC	MK

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NTS	March 2021	19157	S4 - Acceptance	V2.0	1 of 1