Transport Infrastructure Ireland

Luas Finglas

EIAR
Non-Technical Summary
Accessible version

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GLOSSARY OF FREQUENTLY USED TERMS

Acronym	Term
AA	Appropriate Assessment
AC	Alternating Currents
CAP	Climate Action Plan
CEMP	Construction Environmental Management Plan
DC	Direct Currents
DCC	Dublin City Council
DECC	Department of the Environment, Climate and Communications
DMURs	Design Manual for Urban Road & Streets
DoT	Department of Transport
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EMC	Electromagnetic Capability
EMF	Electromagnetic Fields
EMRA	Eastern and Midland Regional Assembly
EPR	Emerging Preferred Route
FCC	Fingal County Council
GAA	Gaelic Athletic Association
GAC	Generic Assessment Criteria

GDA	Greater Dublin Area
GHG	Greenhouse Gas
ICW	Integrated Constructed Wetland
LLCA	Local Landscape Character Areas
LRT	Light Rail Transit
LRV	Light Rail Vehicle
NIS	Natura Impact Statement
NMUs	Non-Motorised Users
NPF	National Planning Framework
NTA	National Transport Authority
NTS	Non-Technical Summary
OCS	Overhead Contact Systems
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PR	Preferred Route
RF	Radio Frequency
RO	Railway Order
SVOC	Semi-Volatile Organic Compound
TII	Transport Infrastructure Ireland
TPH	Total Petroleum Hydrocarbon
VOC	Volatile Organic Compound

SECTION 1: INTRODUCTION

1.1 Purpose of this Report

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for Luas Finglas (hereinafter referred to as the "proposed Scheme").

This document summaries the EIAR in non-technical language, including the likely significant effects identified, the proposed mitigation and monitoring measures, and any residual effects arising from the proposed Scheme. These details have been identified during the Construction and Operational Phases to inform the Railway Order (RO) application process. The EIAR has been prepared to accompany the application for a RO for the proposed Scheme to An Bord Pleanála (hereafter referred to as "the Board").

The environmental impact assessment (EIA) process has been undertaken in line with the EIA Directive, based on the guidance presented in the Environmental Protection Agency (EPA, 2022) '*Guidelines on the Information to be contained in EIARs'* and other relevant guidance.

1.2 Luas Finglas

The proposed Scheme, presented in Map Figure 1, is the next phase of the development of Dublin's integrated light rail network. It is 3.9km in length and will extend the Luas Green Line northwards from its current terminus at Broombridge to a new proposed terminus at Charlestown. The proposed Scheme is largely grade segregated and primarily located within the administrative area of Dublin City Council (DCC) with the exception of the proposed Charlestown terminus, which is in the administrative area of Fingal County Council (FCC).

The proposed Scheme is part of an integrated transport solution that also includes MetroLink, BusConnects and DART+, all of which are included under Project Ireland 2040. These projects will result

in a reliable, sustainable, affordable and integrated public transport network that will support the economy. Also, they will help Ireland meet its climate change targets in line with the Climate Action Plan 2024 (CAP24) and make Dublin a more liveable and sustainable area. While the proposed Scheme is a crucial part of the proposed integrated transport system for the Greater Dublin Area (GDA), it is a standalone project that is not dependent on any other projects for its delivery or effective operation.

A growing population and higher-density housing will create demand for a reliable, high-capacity and sustainable public transport system. By implementing the proposed Scheme, Ireland will continue on the path to achieving its commitments to reaching net zero by 2050. The need for intervention to improve public transport capacity in the Finglas area has been the subject of extensive analysis including the Northwest Corridor Study that supported the previous iteration of the GDA Transport Strategy. The study concluded that Light Rail Transit (LRT) was required in addition to the bus network to support the sustainable growth of the area.

The proposed Scheme will support integrated sustainable transport use through infrastructure improvements for light rail and active travel (both walking and cycling).

The requirement for the proposed Scheme is supported in current policy from national to local level, including the following:

- Project Ireland 2040: National Planning Framework (Department of Housing, Planning and Local Government, 2018);
- National Development Plan 2021-2030 (Department of Public Expenditure, NDP Delivery and Reform, 2021);
- National Sustainable Mobility Policy (Department of Transport, 2022);
- Climate Action Plan 2023 (CAP23) (Department of the Environment, Climate and Communications, 2022);

- Climate Action Plan 2024 (CAP24) (Department of the Environment, Climate and Communications, 2024);
- National Investment Framework for Transport in Ireland (NIFTI) (Department of Transport, 2021);
- Transport Strategy for the Greater Dublin Area 2022-2042 (National Transport Authority, 2022);
- Regional Spatial & Economic Strategy for the Eastern and Midland Region, 2019– 2031 (EMRA, 2019));
- Dublin City Development Plan 2022 2028 (Dublin City Council, 2022); and
- Fingal County Council Development Plan 2023-2029 (Fingal County Council, 2023).

1.3 Objectives of Luas Finglas

A set of overall objectives has been developed to ensure the proposed Scheme addresses the transport related challenges facing the wider Finglas area and aligns with government policy as discussed.

The overarching objectives for the proposed Scheme are to:

- Serve existing and future transport demand;
- Provide a safe, frequent, reliable, efficient and sustainable public transport connection from Charlestown and St Margaret's Road (where it will also serve a strategic Park & Ride facility) to the city centre, via Finglas;
- Reduce public transport journey times between Charlestown, Finglas and the city centre compared to private car trips;
- Contribute to the Climate Action Plan targets for the decarbonisation of transport; and
- Promote economic growth for the residents and businesses of Charlestown, Finglas and the surrounding areas.

The outcomes achieved from delivering the proposed Scheme will be:

- An attractive, resilient, equitable public transport network, better connecting communities and improving access to work, education and social activity;
- To facilitate a transport infrastructure network that prioritises a modal shift to public transport and promotes cycling and walking; and
- To support increased economic and social potential through integrated land-use and transport planning to reduce the time burden of travel.

1.4 Role of Transport Infrastructure Ireland

Transport Infrastructure Ireland (TII) is a statutory non-commercial body, which operates under the aegis of the National Roads Authority (NRA). TII was established through a merger of the NRA and the Railway Procurement Agency under the Roads Act 2015.

In the case of the proposed Scheme, the functions of TII include the design and planning process, seeking (and obtaining) all development consents including related compulsory acquisition approvals from the Board, and constructing the proposed Scheme, subject to receipt of an enforceable RO and ministerial consent to proceed, as well as operating and maintaining it through a contractual arrangement as part of the wider Luas network.

SECTION 2: ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

2.1 Environmental Impact Assessment Process

The EIA is a systematic and a thorough process that assesses the potential likely significant environmental effects of a project. It establishes appropriate design and mitigation measures to avoid, reduce or offset any predicted environmental impacts. This NTS presents a summary of the specialist chapters found in the EIAR, including key aspects of the proposed Scheme and the associated positive and negative impacts of importance.

The EIAR has been prepared to allow the Board to make an informed decision whether to grant the RO for the proposed Scheme. It takes into account information compiled through desk-based assessment, field surveys and consultation with the public, relevant stakeholders and certain bodies. An overview of the stages of the EIA process is presented in Figure 2-1 below.

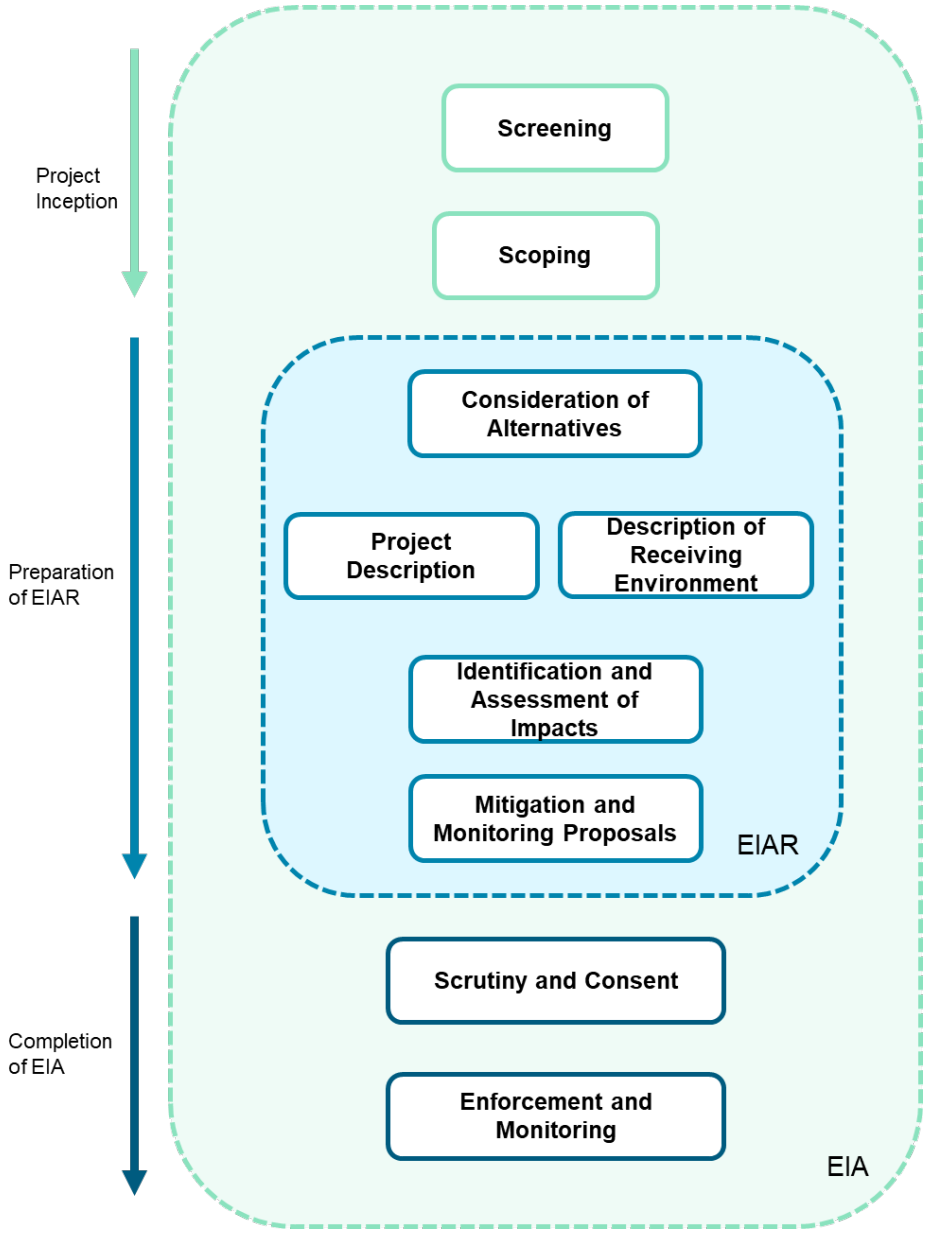

Figure 2-1: EIA Process (Source: EPA, 2022)

The main objectives of the EIAR are to:

- Describe the baseline (existing) conditions before any work on the proposed Scheme has commenced;
- Provide a description of reasonable alternatives studied in the development of the proposed Scheme and the main reasons for choosing the proposed Scheme including a comparison of the environmental effects;

- Describe the proposed Scheme, including the construction works required to build and operate the proposed Scheme;
- Describe the assessment methodologies used to assess the predicted environmental impacts of the proposed Scheme;
- Describe environmental impacts and any likely significant effects which may arise during the construction and operation of the proposed Scheme;
- Propose mitigation measures to reduce or avoid any likely significant effects which may arise during the construction and operation of the proposed Scheme;
- Describe residual impacts after mitigation measures have been put in place, as well as cumulative impacts for all environmental aspect; and
- Develop monitoring programmes to oversee the implementation and maintenance of the mitigation measures proposed, and their efficacy to ensure no unacceptable effects occur.

All assessments have been carried out in accordance with best practice and applicable guidelines. Some chapters of the EIAR use specific guidelines related purely to that particular discipline.

The EIAR documents have been divided into the following Volumes for ease of use:

- Volume 1 – NTS (this document);
- Volume 2 – Introduction and Scheme Description;
- Volume 3 – Environmental Baseline and Assessment;
- Volume 4 – Figures; and
- Volume 5 – Appendices.

SECTION 3: RAILWAY ORDER PROCESS

New railway works are governed by the Transport (Railway Infrastructure) Act, 2001 (as amended), This Act provides for a RO application to be made by TII to The Board. The proposed Scheme is categorised as a Strategic Infrastructure Development (SID) under the Planning and Development (Strategic Infrastructure) Act 2006 as amended. The RO application process is broadly similar to other SID planning application processes. Sections 37 to 47F of the Transport (Railway Infrastructure) Act, 2001 (as amended by the Planning and Development (Strategic Infrastructure) Act 2006, the Dublin Transport Authority Act 2008 and the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743/2021)) set out the process required for making an application for an RO. Section 37(3) states that, *'an application under Subsection (1) shall be made in writing in such form as the Minister may specify and shall be accompanied by:*

- *a draft of the proposed order;*
- *a plan of the proposed railway works;*
- *in the case of an application by the Agency or a person with the consent of the Agency, a plan of any proposed commercial development of land adjacent to the proposed railway works;*
- *a book of reference to a plan required under this subsection (indicating the identity of the owners and of the occupiers of the lands described in the plan); and*
- *a statement on the likely effects on the environment (referred to subsequently in this Part as an 'environmental impact assessment report') of the proposed railway works.'*

In order to meet these requirements, the RO application will include a number of schedules, and drawings that present the details of the proposed Scheme. The application will also include an EIAR and associated appendices. This material together with any feedback/submissions received during the statutory public consultation period (which will commence following the submission of the lodgement of the RO application) will be reviewed and considered by the Board. It is likely at this stage that the Board will call an Oral Hearing prior to making a decision on the RO application. The Oral Hearing is a process whereby TII and its specialists are given an opportunity to present evidence on the proposed Scheme and on submissions received. There is also an opportunity for the Board and parties who made submissions during the statutory consultation process to question TII and its specialists. Following this process and based on the information available to the Board, they will make a decision on the application.

SECTION 4: NEED FOR LUAS FINGLAS

4.1 Context

Private car dependence causes significant congestion, affecting our quality of life, our urban environment, and road safety. As the population of the GDA is projected to rise to almost 1.5 million by 2040, there will be an increased demand for travel on roads which currently do not have the capacity for more traffic. Therefore, enhanced sustainable transport options are needed.

Without intervention, traffic congestion will lead to longer and less reliable pedestrian, cycle, and bus journeys throughout the region and this will affect the quality of people's lives. Modelling analysis indicates that in the opening year 2035, Luas Finglas will lead to a 50% increase in transport capacity utilisation for trips travelling southwards towards the city centre in the AM peak. In contrast, sustainable transport infrastructure helps create more sustainable communities and healthier places, while also stimulating our economic development. It contributes to good health and well-being when delivered effectively.

The proposed Scheme, therefore, aims to provide a safe, frequent, reliable, efficient and sustainable public transport connection from Charlestown and St Margaret's Road (where it also serves a strategic Park & Ride facility) to the city centre, via Finglas.

4.2 Project Ireland 2040 – National Development Plan 2021 - 2030

Project Ireland 2040 is the Irish government's longstanding central strategy to make Ireland a better country for all and to work towards a more resilient and sustainable future. Project Ireland 2040 cites specifically the proposed Scheme under section 2.4 Sustainable Mobility. The strategy ensures the alignment of investment plans with the stated National Strategic Objectives for 2040 in a considered, cohesive and defined manner. The National Planning

Framework (NPF) and the National Development Plan 2021-2030 together form Project Ireland 2040.

The National Development Plan 2021-2030 sets out a selection of projects in Chapter 9: Sustainable Mobility' as 'Strategic Investment Priorities', in which the proposed Scheme is mentioned. The proposed Scheme, forming part of the advancement of Luas capacity within the overall Light Rail network is identified as a component of a Strategic Investment Priority, with an associated investment commitment, which has been determined as central to the delivery of the National Planning Framework vision. Delivering the proposed Scheme will provide the infrastructure needed to help Ireland move from excessive dependence on private cars to walking, cycling and public transport.

4.3 Climate Action Plan 2024

The Climate Action Plan is an annual report which sets out at a national level how Ireland is to halve its emissions by 2030 (51%) and reach net zero no later than 2050. The Climate Action Plan is a road map to delivering Ireland's climate ambition.

Section 15 of the 2024 Plan relates to transport, which highlights that the transportation sector accounts for a significant proportion of Ireland's Greenhouse Gas (GHG) such as Carbon dioxide (CO_2), Methane (CH_4), and Nitrous oxide (N_2O) emissions. Furthermore, the plan states that '*meeting our 2030 transport abatement targets will require transformational change and accelerated action across all key decarbonisation channels*'.

Key targets to remain within the sectoral emissions ceiling include a 20% reduction in total vehicle kilometres travelled relative to business-as-usual, a 50% reduction in fossil fuel usage, a significant behavioural shift from private car usage to increase the total share of journeys undertaken by walking, cycling or public transport, and continued electrification of our vehicle fleets.

The Avoid-Shift-Improve framework for transport sustainability introduced in CAP23 has been retained in CAP24 to categorise all actions. This framework emphasises the crucial role of spatial and land-use planning in designing transport systems that can support our net-zero ambition. The expected outcome is that CAP24 will build on CAP23 in enabling Ireland to meet the first and second carbon budget.

The proposed Scheme is needed to contribute positively to the transformational change in the transport sector advocated in CAP24, including identified key performance indicators (KPIs) to deliver abatement requirements in the form of significant increases to sustainable transport trips and modal share. It represents an expansion of an electrified rail service which will offset reductions in car and fuel usage whilst increasing daily public transport journeys.

4.4 Greater Dublin Area Transport Strategy

Published by the National Transport Authority (NTA), this transport strategy provides a framework for the planning and delivery of transport infrastructure and services in the GDA over the next two decades. The overall aim of the strategy is '*to provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports the regional economy*' (National Transport Authority, 2022). This is framed on the basis of four strategy objectives, as follows:

- An Enhanced Natural and Built Environment;
- Connected Communities and Better Quality of Life;
- A Strong Sustainable Economy; and
- An Inclusive Transport System.

Section 4.3.1 of the GDA Strategy confirms that key identified rail projects set out in the Transport Strategy for the GDA are among the future growth enablers for the National Planning Framework.

The Transport Strategy commits to existing transformative projects in development, including BusConnects, DART+ and MetroLink, as well as the proposed Scheme. The proposed Scheme is supported by the following specific measure:

Measure LRT3 – Luas Finglas: *'It is intended to extend the Luas Green Line northwards to Finglas, inclusive of a potential park and ride facility at or close to its terminal stop'.*

It is further added in the supporting text that:

'The Green Line extension to Broombridge (Luas Cross City) was opened to passenger service in 2017. It has long been planned that this line would eventually be extended to serve travel demand from Finglas, inclusive of a potential park and ride facility at or close to its terminal stop. In recent years, the NTA with TII have sought to identify an Emerging Preferred Route for this project and details of this were published in 2020. It is the intention to complete detailed design and planning over the coming years and to progress the scheme to construction'.

SECTION 5: ALTERNATIVES CONSIDERED

This section presents an overview of the reasonable alternatives considered at all stages of the proposed Scheme development in order to clearly outline:

- The robust decision-making process that has led to the proposed Scheme's development;
- How environmental analysis was integrated into the Luas Finglas' development from the earliest stages of the proposed Scheme;
- The main reasons, environmental and otherwise, for choosing Luas Finglas or the specific element of the proposed Scheme from the reasonable alternatives; and
- The likely evolution of the current state of the environment without implementation of the proposed Scheme (do nothing scenario).

An outline of the reasonable alternatives considered and assessed is provided in

Table 5-1 below.

Table 5-1: Outline of Reasonable Alternatives considered during the development of the proposed Scheme

ALTERNATIVES CONSIDERED	DESCRIPTION
Previous Studies:	
Luas Line D1 – Broombridge to Metro West via Finglas. Route Corridor Identification and Feasibility Report. (See section 5.1)	
Luas Line D. Analysis of Route Options. (See section 5.3)	
Strategy / Policy where Alternatives to Luas considered:	
Fingal North Dublin Transport Study / North West Corridor Study / Transport Strategy for the GDA. Outline of the consideration of alternatives having regard to environmental effects as referred to in the Fingal North Dublin Transport Study 2015, North West Corridor Study 2015 as it informed the Transport Strategy for the GDA 2016 – 2035 and the updated Transport Strategy for the GDA 2022 – 2042.	
Do-Nothing Alternative:	
'Do-Nothing' Scenario. This is a general description of the key environmental effects that would be expected for the Do-Nothing scenario should the proposed Scheme not proceed. (See section 5.2)	
Identification of the Emerging Preferred Route (EPR) (2020):	

Alternative options for the proposed Scheme (Stage 1 and Stage 2). This section summarises the proposed Scheme alternatives considered leading to the Emerging Preferred Route having consideration of the potential environmental effects. (See section 5.3)

Identification of the Preferred Route (PR) (2021) and further design changes:

Further assessment of alternative options for the proposed Scheme. This section summarises further alternatives assessments undertaken to determine the Preferred Route having regard to public consultation feedback. (See section 5.3.1)

Alternative Scheme Level Design: This section summarises the proposed Scheme alternatives considered having regard to environmental effects leading to decisions made on the proposed Scheme design fundamentals including:

- Stabling Site Location;
- McKee Avenue / St. Margaret's Road Junction Design; and
- SBN Substation location.

Alternatives Technologies. Discussion of alternative technologies considered having regard to environmental effects leading to decisions made on the proposed Scheme covering:

- Alternative track proposals (grass track, embedded track, etc).
- See section 5.4)

Alternative Bridge Designs:

- Broombridge tie-in;
- Broome bridge;
- Tolka Valley Park Bridge; and
- Pedestrian Overbridge Design.
  (See section 5.4)

Alternative Alignments: Alternative alignment options which were assessed having regard to environmental effects to determine the preferred Scheme alignment:
Broombridge Road realignment;

- Tolka Valley Park minor re-alignments
- Farnham Crescent Park alignment;
- Casement Road & Patrickswell Place;
- Mellowes Alignment;
- Raven's Court Alternative Access; and
- St Margaret's Court.
  (See section 5.4)

Stop locations and layouts: Discussion on how the specific Stop locations and layouts emerged based on the proposed Scheme design decisions at EPR and PR stage having regard to constraints of each site and potential environmental effects:

- St Helena's Stop; and
- Mellowes Park Stop.
  (See section 5.4)

Park & Ride location and layout: Discussion on how the specific Park & Ride locations and layouts emerged based on the proposed Scheme design decisions at EPR and PR stage having regard to constraints of each site and potential environmental effects. (See section 5.4)

Alternatives for the Construction Phase: Construction Compounds
This section examines the chapter considered alternatives assessed having regard to environmental effects as they relate to the Construction Phase of the proposed Scheme:

- Location of Construction Compounds.

5.1 Strategic Alternatives

In 2014, the NTA commissioned the Fingal / North Dublin Transport Study (NTA, 2015) to identify the optimum long-term public transport solution to connect three core areas, namely Dublin City Centre, Dublin Airport and Swords, running north / south through the Fingal and Dublin City local authority areas. The study, carried out by AECOM, considered alternative transport solutions for the provision of transport infrastructure for the year 2035. The assessment identified MetroLink as the best medium- and long-term transport project for the GDA. However, one of the main reasons given for its choice, was that this option retained the opportunity to extend Luas Cross City to Finglas.

In parallel, a separate study carried out by the NTA 'The Northwest Corridor Study (NWCS) (NTA, 2015)' analysed the demand for transport in the northwest of Dublin. It concluded that LRT was required in addition to the bus network to support the sustainable growth of the area. The subsequent Transport Strategy for the GDA 2016-2035 (and its recent successor for 2022-2042) identified an extension to the Luas from Broombridge into Finglas as a key measure to improve public transport connections in the area. The Luas Cross City which brought the Luas from St Stephen's Green to Broombridge was planned as a phase in the development of Dublin's light rail network and it was constructed to facilitate a northern extension through Finglas at a future date.

More recently, the January 2023 published Transport Strategy for the GDA 2022-2042 supports the findings of the previous GDA Transport Strategy 2016-2035 and commits to existing transformative projects in development, including Luas Finglas.

5.2 Do Nothing

The consideration of alternative options included a 'Do Nothing' Scenario. This is a scenario where the proposed Scheme would not be constructed. In the 'Do Nothing' Scenario there are no

improvements made to the current transport systems and as a consequence traffic congestion will continue to grow. This will result in increased journey times for commuters and impacts on the efficiency of transport vital to the economy as well as increased pollution and GHG emissions. The Do Nothing Scenario is therefore an unacceptable scenario.

5.3 Route Design and Alternatives

During the design development of the proposed Scheme, reasonable alternative route options were also extensively considered to ensure the most effective solution. A stakeholder management plan was created to engage and communicate with key stakeholders, addressing their concerns and interests throughout the project. The design process was further refined by incorporating feedback and new information gathered during each stage of public consultation, as well as by analysing environmental data, transport data, geotechnical information, and surveys conducted by the Luas Team.

Development of the proposed Scheme has evolved in the following stages:

- A Feasibility and Options Report (Luas Finglas **Options Selection Report Stage 1**) was concluded in 2019, setting out the initial route options for the proposed Scheme;
- Building on the outcomes of Stage 1, a **second stage of the Options Selection Report** was prepared in 2020 to determine the EPR along the Finglas area;
- A **first round of non-statutory public consultation** was undertaken on the EPR from 28th July 2020 to 17th September 2020;
- **Development of Preferred Route** (September 2020 to December 2021). Informed by feedback from the first round of public consultation, stakeholder and community engagement and the availability of additional design information, the design of the EPR evolved with further alternatives considered;

- A **second round of non-statutory Public Consultation** was undertaken on the Preferred Route from 7th December 2021 to 31st January 2022. Informed by feedback from the overall public consultation process, continuing stakeholder engagement and the availability of additional design information, the PR was finalised; and
- To inform the development of the EIAR, an **EIA Scoping Report** was prepared, outlining the proposed scope, methods, structure, and content of the EIAR. Key statutory and non-statutory stakeholders were consulted, with the report issued on 12th April 2022, inviting their feedback.

The initial route alternatives considered covered a network between Broombridge and Charlestown. These were narrowed down using a high-level qualitative method based on professional judgement and a general appreciation for existing physical conditions / constraints including environmental considerations within the study area.

The alternative route options were then evaluated under the following criteria:

- Environment;
- Safety;
- Integration;
- Accessibility and Social Inclusion;
- Economy; and
- Alignment and curvature degree.

Careful consideration for alternative cycling route options was also fundamental in the process of defining the Emerging Preferred Route.

The Emerging Preferred Route was subject to non-statutory public consultations in 2020. Submissions made by stakeholders and the public during the public consultation were carefully analysed. These

stakeholder observations led to a number of design development changes and improvements.

Details of the emerging Preferred Route consultation can be found in section 6.1.1 below.

5.3.1 Preferred Route

Following the conclusion of the Emerging Preferred Route consultation, the Emerging Preferred Route was modified to address stakeholder observations and to incorporate a number of design development changes and improvements. This culminated in the development of a Preferred Route for the proposed Scheme.

Further information on the Detailed assessment of alternatives led to the identification of the proposed Scheme, can be found in Chapter 4 - Alternatives Considered of this EIAR.

5.4 Design Alternatives

Following the completion of the non-statutory public consultation process in relation to the Preferred Route, various amendments were made to the scheme proposals to address some of the issues raised in submissions, including incorporating suggestions and recommendations from residents, community groups, businesses, elected representatives, and stakeholders, and / or arising from the availability of additional information. These amendments were incorporated into the designs and informed the proposed Scheme design which was brought forward and developed. Some of the design alternatives considered during the route assessment process include length, curvature, and location of stops, depots and technologies.

Discussion of alternative technologies considered having regard to environmental effects leading to decisions made on the proposed Scheme covering:

- Alternative track proposals (grass track, embedded track, etc).

However, only those trackform solutions, compatible with the existing network and meeting the specific requirements for the proposed Scheme were assessed.

The assessment of alternatives also took account of environmental impacts, alongside other relevant factors including the economy, safety, and accessibility, to arrive at the proposed Scheme.

SECTION 6: CONSULTATION

Public participation has been an integral part of the proposed Scheme from the outset. Non-statutory public consultation was carried out to inform the public and other stakeholders about the proposed Scheme from an early stage and to seek feedback and participation throughout its development.

A comprehensive consultation and engagement process with stakeholders, landowners and members of the public was undertaken. The consultation process ensured the views of various groups, individuals and stakeholders were taken into consideration throughout the development of the proposed Scheme and in the preparation of this EIAR.

The non-statutory consultation process assisted in:

- Establishing a sufficiently robust environmental baseline for the proposed Scheme and the receiving baseline environment;
- Providing an opportunity for the members of the public and other interested parties to become involved with the process and to share with the Luas Team any relevant supporting information that should be considered in the design process. This allows for early identification and focused consideration of significant impacts; and
- Ensuring the appropriate involvement of the statutory and non-statutory stakeholders in the design and assessment.

6.1 Consultation Activities

6.1.1 Emerging Preferred Route Consultation

The announcement of the Emerging Preferred Route was made on the 28th July 2020 with the inclusion of the first non-statutory public consultation on the development of the EPR over a period of three weeks, from 28th July 2020 to 17th September 2020 and was supported by a programme of stakeholder and community engagement activities.

TII had originally planned to deliver this consultation with mixed methods, including face-to-face consultation events. However, the social distancing restrictions put in place as a result of the COVID-19 pandemic (2020-2021) meant that many in-person activities could no longer be delivered. Despite this, TII decided to pursue an online consultation to ensure the scheme continued to run on schedule, and people were given an early opportunity to review and provide feedback on the proposals. A small number of socially distanced face-to-face meetings took place, when requested by local residents.

The issues raised during the first non-statutory public consultation process were considered as part of the route options assessment process and in determining the Preferred Route. The Emerging Preferred Route proposals were amended to address the issues raised in submissions where possible, incorporating suggestions and recommendations from residents, community groups, disability user groups, elected representatives and stakeholders, where appropriate. These amendments were incorporated into the design and informed the Preferred Route design-development which was subsequently also published for non-statutory public consultation.

6.1.2 Preferred Route Consultation

The Preferred Route non-statutory public consultation took place over an eight-week period from 7th December 2021 to 31st January 2022.

The public were invited to make written submissions in relation to the published proposals to TII, either through an online form, by email or by post.

Due to social distancing restrictions during the consultation period, it was not possible to organise consultation events. However, in response to requests from groups of residents or their representatives, elected public representatives and representatives of community organisations, additional engagement took place via online meetings.

The issues raised during the second round of public consultation have been considered as part of the final Preferred Route and formed the basis of the preliminary design.

6.1.3 Non-Statutory Consultation on Environmental Impact Assessment Scoping

In addition to the public consultation on the proposed Scheme, the Luas Team undertook consultation during the preparation/ development of the EIAR with statutory and non-statutory bodies and relevant non-statutory consultees.

During the development of the EIAR, statutory and non-statutory bodies (including the Department of the Environment, Climate and Communications (DECC), the Department of Transport (DoT), FCC and DCC, and relevant non-statutory consultees were provided with a report, 12th April 2022, outlining the proposed approach to the environmental assessment and were invited to comment. Feedback from this consultation was also used to inform the EIAR and the preliminary design proposals.

6.1.4 Consultation with Landowners

Engagement with landowners whose properties are impacted, or potentially affected, has been ongoing as the design development for the proposed scheme progresses, spanning from the earliest stages in 2019 through to 2024. This engagement has overlapped with public consultations held in July 2020 and December 2021.

Additional contact was made to affected landowners in 2022 through 2024 offering further engagement. Over the course of the engagements, affected property owners have had the opportunity to discuss different aspects of the proposed Scheme with the design team. Further stakeholder consultation has continued during 2024.

6.1.5 Consultation with Local Residents and Business Groups

Throughout the design development process of the proposed Scheme from the initiation of the first non-statutory public

consultation in July 2020, TII facilitated consultation on request with small local resident groups and business with interests on / adjacent to the route. Such events facilitated discussion on the design for the proposed Scheme and attendees were given the opportunity to ask questions of the Luas Team and provide feedback.

6.1.6 Consultation with Disability Groups

In line with the United Nations Convention on the Rights of Persons with Disabilities, TII facilitated consultation on the proposed Scheme with Disabled Persons Organisations, such as Voice of Vision Impairment. TII also consulted on an ongoing basis with the National Disability Authority and with users and service providers, through the Luas User Group, encouraging feedback throughout the design process.

6.1.7 Pre-application Consultation

In advance of the RO submission, a pre-application consultation meeting took place on the 26th May 2023 with the Board. This meeting allowed the Luas Team to provide to the Board an overview of the proposed Scheme and an outline of key environmental issues being considered in the EIAR. In addition, procedural processes and matters were agreed with the Board having regard to the lodgement of the RO Application in a second meeting held on the 15th of March 2024.

SECTION 7: DESCRIPTION OF THE PROPOSED SCHEME

The design of the proposed Scheme has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental impacts, where practicable, whilst ensuring the objectives of the proposed Scheme are attained. In addition, where appropriate, feedback received from the comprehensive consultation programme, undertaken throughout the option selection and design development process has been incorporated.

The proposed Scheme is the northwards extension of the existing Luas Green Line from the current terminus at Broombridge. The proposed route is 3.9km in length and will include four new Stops, cycle lanes and footpaths along part of the route, a Park & Ride facility near St Margaret's Road, two bridges (at Tolka River and over the Maynooth Line railway and Royal Canal) and an extension to the Light Rail Vehicle (LRV) storage area at the existing Luas Green Line Hamilton depot at Broombridge.

The proposed Scheme, located fully within County Dublin, passing through the administrative areas of FCC and DCC, comprises a high-capacity, high-frequency light rail running from Broombridge to Charlestown, connecting Finglas and the surrounding areas with Dublin’s wider public transport network by providing a reliable, and efficient public transport service to the city centre via Broombridge.

The proposed Scheme has been designed to interchange with existing and future elements of the transport network including interchange opportunities with bus networks at all the new Stops and with mainline rail services at Broombridge. In addition, the proposed Scheme through the inclusion of integrated cycle lanes and cycling infrastructure connecting the proposed Scheme to the GDA cycle network, sets out to facilitate multimodal "cycle-LRT trips" as a key aspect of the proposed Scheme.

Most of the route will be built using grass track, an attractive and sustainable innovation for urban transport in Ireland.

Two traction substations are necessary for powering the proposed Scheme, which will be located respectively at Finglas Village Stop and St Margaret's Road Stop. An additional substation is located within the proposed Park & Ride facility to provide its own power source via photovoltaic (PV) panels as well as an electrical supply for the electric vehicle (EV) charging points provided as part of the proposed Scheme.

The following geographical sections are used to describe the proposed Scheme from south to north:

- Area 30 - Broombridge Depot (section 7.1);
- Area 31 - Broombridge to Tolka Valley (section 7.2);
- Area 32 - Tolka Valley Road to Finglas Village Stop (section 7.3);
- Area 33 - North of Finglas Village Stop to Charlestown Stop Terminus (section 7.4).

7.1 Area 30 - Broombridge Depot

This area is located at the northern end of the existing Luas Green Line, just south of the Royal Canal and Maynooth Railway line. The current stabling facilities at Broombridge Hamilton depot are at capacity, and therefore it is necessary to provide new stabling lanes to enable additional vehicles for the proposed Scheme. DCC own the land directly adjacent to the proposed stabling area and several consultations were held with DCC, whose goal is to build housing on that land, to ensure coordination of design. Following design optimisation, the footprint of the stabling area was determined to be four lanes. This has a positive impact of reducing land take from DCC and thereby reducing impacts on the potential development of the adjacent DCC property. Refer to Figure 7-1 and Figure 7-2.

The extended stabling area consists of three ballasted tracks and a fourth as an embedded track lane to facilitate vehicular access. The

stabling area will have provision for the storage and operation of eight additional LRVs. Area 30 requires re-levelling and a new boundary fence to the southern side as part of construction of the proposed Scheme.

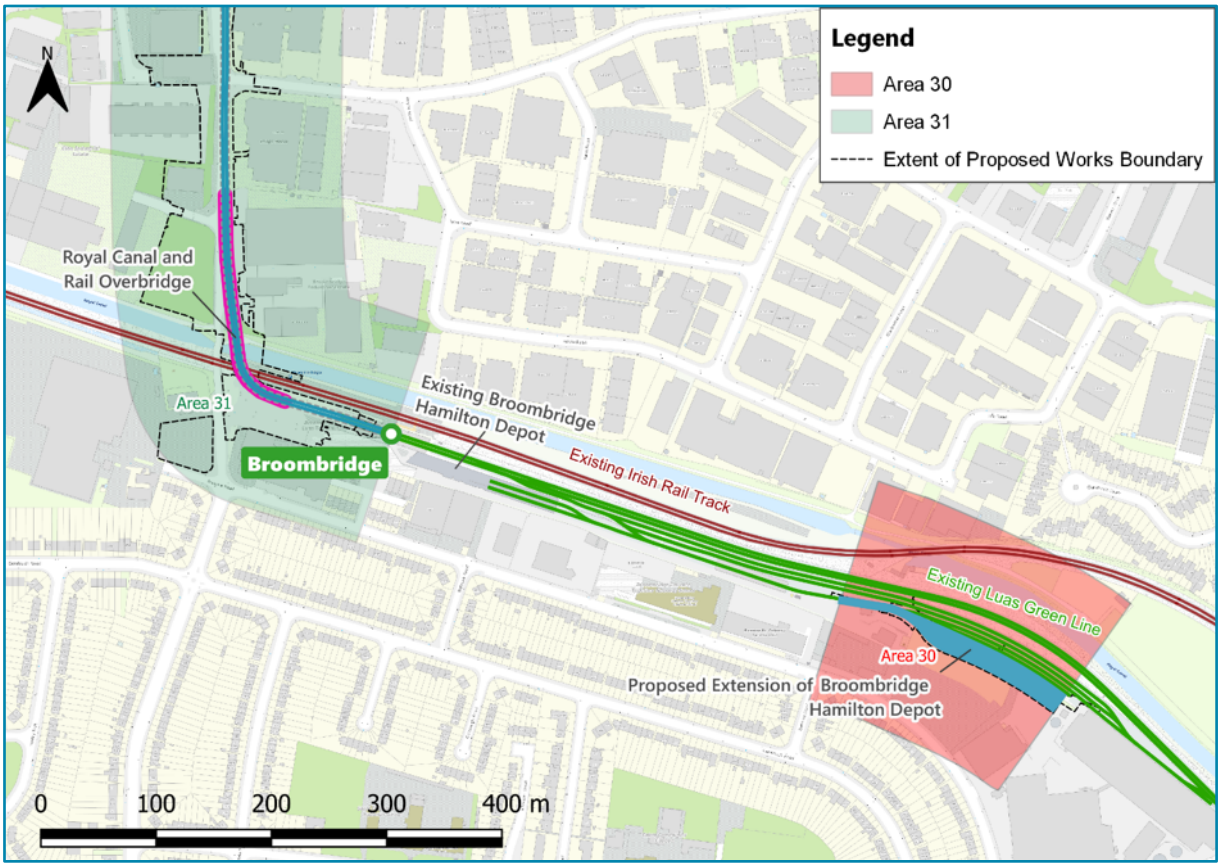

Figure 7-1: Area 30 Broombridge Depot Stabling Site, located to the south of the Royal Canal / Maynooth Railway Line

Figure 7-2: 3D Rendered Image of the proposed extension of Broombridge Depot Stabling Site, looking southwards (15 years post-construction date)

7.2 Area 31 - Broombridge to Tolka Valley Road

This area is approximately 850m long, extending from the existing Luas Green Line at Broombridge to Tolka Valley Road. This section will include two major structures: the crossing of the existing Maynooth Railway line, Royal Canal and Greenway; and the crossing of Tolka Valley Park and River Tolka. No new Luas Stops are included in this section. Refer to Figure 7-3.

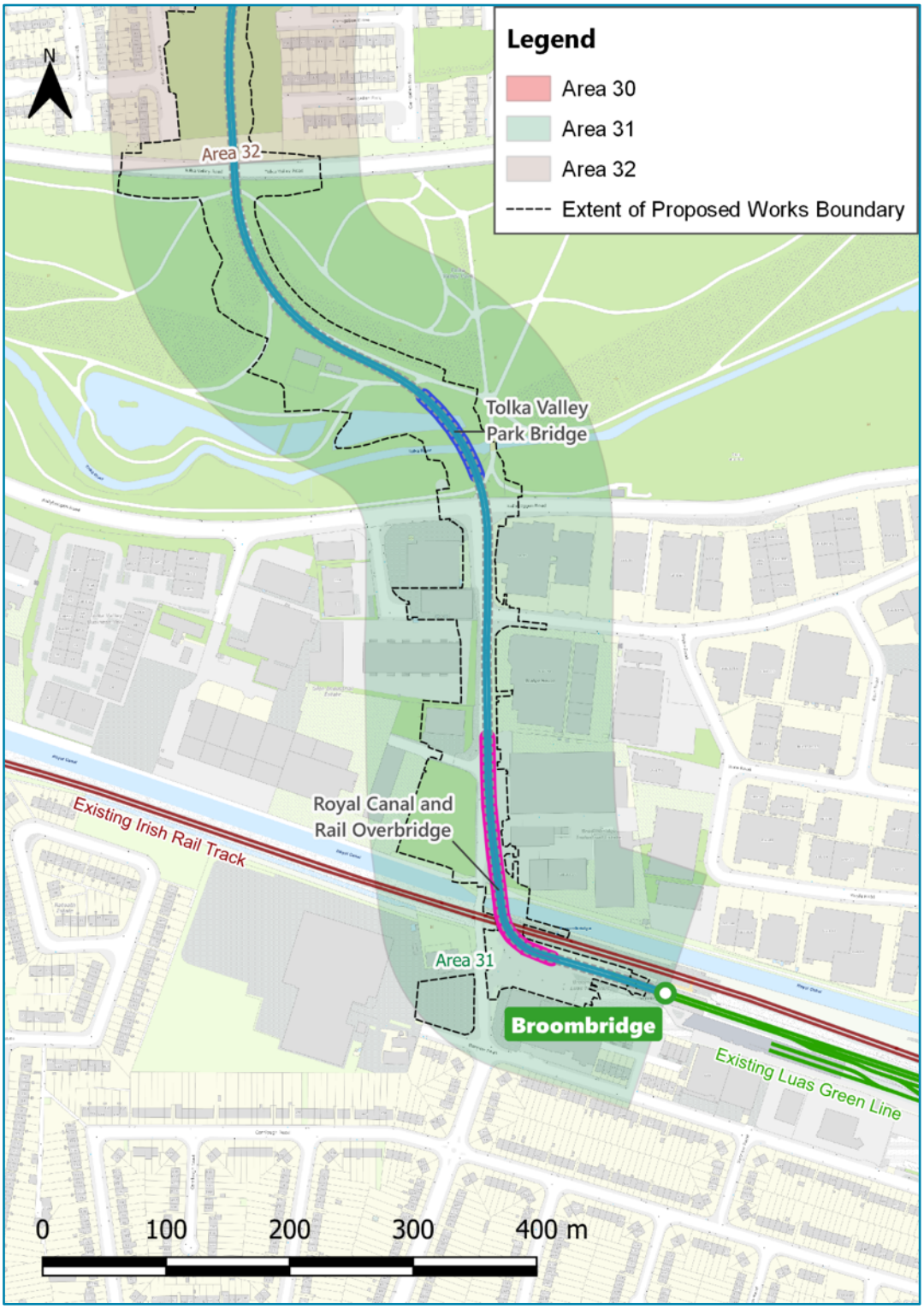

Figure 7-3: Area 31 Broombridge to Tolka Valley Road

The new track will commence to rise on a new solid ramp structure just west of the current Broombridge Stop platform. This ramp connects to the proposed bridge above the Maynooth railway line and the Royal Canal. The height of the bridge deck has been determined by the clearance requirements for both the canal and

railway line, taking into account the future electrification of the Maynooth railway line. A small area underneath, adjacent to the southern abutment of the bridge, will be used to accommodate a cycle storage facility which will further accommodate and encourage cycle-LRT trips.

The proposed LRT Royal Canal rail bridge has been designed with input from Waterways Ireland and Iarnród Éireann, along with feedback from consultations with DCC. It considers the existing heritage structure, Broome Bridge, and its visual impacts while aiming to create a landmark that is visually attractive.

The proposed Royal Canal rail bridge spans clear across both the railway line and the canal with a set of piers on the south side adjacent to the Iarnród Éireann platforms (effectively forming an arched opening to allow access to the Iarnród Éireann platforms) and a set of piers on the northern side just beyond the existing wing walls of the historic Broome Bridge. Access beneath the bridge deck on this side is provided for Waterways Ireland maintenance vehicles and for both pedestrians and cyclists using the canal towpath and greenway. The proposed bridge is for the exclusive use of the LRT and does not accommodate pedestrians or cyclists.

Figure 7-4: 3D Rendered Image on proposed Royal Canal rail bridge, looking north-eastwards (15 years post-construction date)

The proposed 212.5m long Royal Canal rail bridge structure continues along the western boundary of the adjacent industrial premises (Colorman). Refer to Figure 7-4. A new vehicular access is to be provided for the business premises beneath the bridge. The structure terminates in a solid ramp structure just south of Lagan Road where the track reaches existing ground level to proceed northwards via new signalised junctions. The alignment continues past the next industrial premises (Fashionflo) where the boundary walls are to be relocated. At the Westrock premises, demolition of an existing retaining wall and reconstruction of a new wall in a position closer to the building is proposed. Some modification works are required to accommodate access for goods vehicles and staff to businesses, including provision of new access gates on Lagan Road. The track construction in this area consists of slab track construction for structures, embedded track for road crossings and grass track elsewhere.

Road works at Broombridge Road include road re-alignment both horizontally and vertically to accommodate the track alignment and access to adjacent properties. Additional widening is required to provide the necessary cycle lanes, footpaths and landscape buffer zones. Refer to Figure 7-5. The proposed Scheme includes changes to the access arrangements and boundary walls along both sides of Broombridge Road. The existing mini-roundabout at the entrance to the Glen Industrial Estate will be changed to a priority junction and measures will be put in place at Lagan Road junction to indicate to drivers that access is restricted across the bridge in a southbound direction, utilising surfacing treatment, signage and landscaping measures. Differences in level require the construction of a new retaining wall along the front of the Glen Industrial Estate premises south of the current entrance location. A building located in Glen Industrial Estate to the north of the existing

entrance must be demolished as a result of the widening of the roadway. Further north, works include new boundaries and the demolition of Unit 124, Broombridge Close.

Figure 7-5: 3D Rendered Image of the proposed realignment of Broombridge Road (looking northwards) with proposed Royal Canal rail bridge to right (15 years post-construction date)

The proposed Scheme crosses Ballyboggan Road at grade via a new signalled junction and then enters Tolka Valley Park. The existing access gates will be removed, and a more open access point will be provided.

The proposed Scheme crosses the River Tolka via a new Tolka bridge which will feature a grass/green deck. Refer to Figure 7-6. A parallel cycle lane over the bridge is also provided. The overall length of the bridge is 65m, consisting a of a central span of 45m and two 10m end spans. The two 10m end spans have side walls

which block the space beneath them. The south pier is approximately 5m from the riverbank whereas the north pier is set back approximately 22m from the riverbank to minimise the impact on the existing Integrated Constructed Wetland (ICW). Some modification of the Integrated Constructed Wetland is required to account some loss of functionality due to overshadowing of the new bridge.

Figure 7-6: Visualisation of the proposed bridge in Tolka Valley Park, looking eastwards (15 years post-construction date)

The proposed Scheme continues north, rising towards Tolka Valley Road. Here the proposed Scheme passes through an area of contaminated land, which was previously used as a municipal landfill. The proposed Scheme also passes at two locations beneath a set of ESBN high tension cables. The existing footpaths and cycle lanes within the park will require modifications to ensure safe accessible crossing points for both pedestrians and cyclists alike. Refer to Figure 7-7.

Figure 7-7: 3D Rendered Image at proposed Tolka Valley Park (15 years post-construction date)

The proposed Scheme crosses Tolka Valley Road at grade via a new signal-controlled crossing. Existing railings around the park will be modified to facilitate the LRT crossing and new landscape layouts and features will be provided.

7.3 Area 32- Tolka Valley Road to Finglas Village Stop

This area is approximately 1.45km long including St Helena's Road, Patrickswell Place and Mellowes Road. There are two new Stops proposed in this area: St Helena's and Finglas Village Stop. Refer to Figure 7-8. This area also includes the first of two traction substations which are required for the extension of the system.

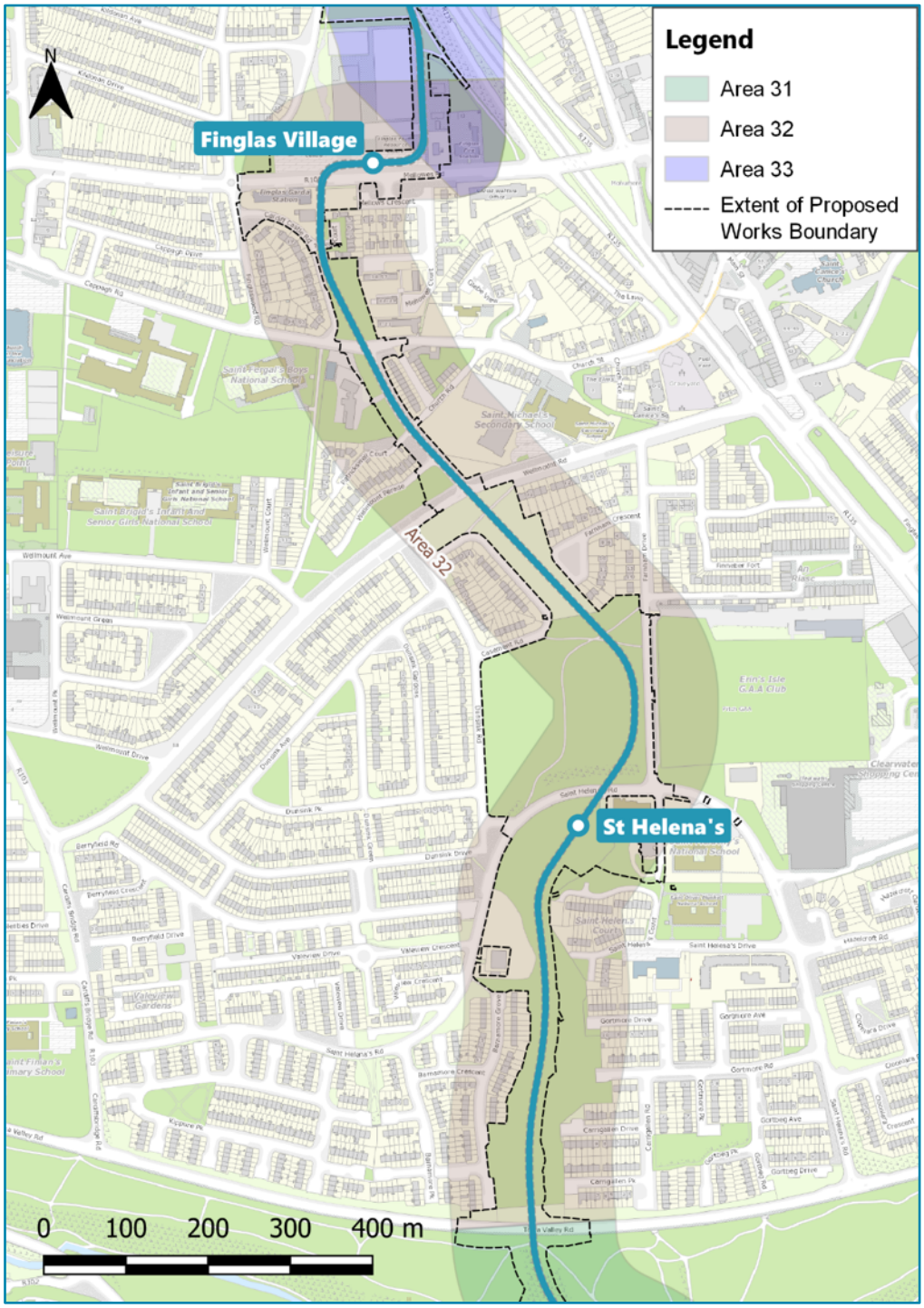

Figure 7-8: Area 32 Tolka Valley Road to Finglas Village Stop

The proposed track rises in response to changes in existing ground levels between Tolka Valley Road and St Helena's Road, a former valley, (locally known as "The Valley"), which contained the Finglaswood Stream that has since been culverted and infilled. It is proposed to divert this culvert as part of the proposed Scheme. Parallel to the alignment, there are new footpaths and a cycle lane,

designed with consideration for accessibility, public safety, cycle-LRT trips, and issues such as antisocial behaviour.

The first Stop on the proposed Scheme is located just south of St Helena's Road adjacent to the St Helena's Family Resource Centre and the St Helena's Childcare Centre. Refer to Figure 7-9. The location of the Stop has taken into consideration pedestrian access and bus interchange with services on St Helena's Road. The Stop features landscaped areas, a hard standing area and a small pavilion structure to facilitate public use of the space around the St Helena's Stop.

Figure 7-9: 3D Rendered Image at proposed St Helena's Stop, looking northwards (15 years post-construction date)

In order to facilitate safer crossings at the Luas line and St Helena's Road junction, the access arrangements for the Resource Centre and Childcare Centre will be modified so that all vehicular access will be via Farnham Drive extension. The internal layout of the Resource Centre and Childcare Centre car park is being reconfigured to suit. A small turning hammerhead is proposed at the end of Farnham Drive extension to facilitate the parents of children attending St Malachy's primary school. Farnham Drive

extension will be re-engineered to re-balance its function more towards the needs of vulnerable road users and to reflect its location beside a school access.

A new signal-controlled junction is created on St Helena's Road and from here, the proposed Scheme crosses into the area of Farnham pitches and runs parallel to Farnham Drive. There are two playing pitches at this location. In order to accommodate the proposed Scheme, the pitches are to be modified and relocated. Due to space limitations, the alignment will have ball-stop net protection at the corners of the Gaelic Athletic Association (GAA) pitch. The alignment is slightly elevated above the pitch level and the resulting embankment will provide a safe viewing area for spectators. Within the pitch areas, the existing footpath dividing the current playing fields will be removed and the entire area will be re-levelled. Safe crossing points for pedestrians have been provided at the alignment and Farnham Drive to facilitate access for the Erin's Isle GAA club. A small equipment storage structure is proposed at this location. Refer to Figure 7-10.

Figure 7-10: 3D Rendered Image at proposed Farnham Park, looking northwards (15 years post-construction date)

North of the Farnham pitches, the track continues through the parklands alongside Casement Road before arriving at a controlled crossing of Wellmount Road. The alignment continues northwards through Patrickswell Place where the existing road is to be realigned westwards to accommodate the proposed Scheme within the existing corridor. This area contains archaeological features (King William's ramparts) and will require careful monitoring during construction. The alignment then continues to cross Cappagh Road via a new signal-controlled junction. Continuing at grade parallel to Cardiff Castle Road, the alignment then crosses the entrance to Ravens Court, a residential complex of 12 units. Refer to Figure 7-11. Proposed works here include relocation of the existing boundary wall and changes to the entrance of the complex in order to ensure intervisibility and safe crossing of the proposed Scheme.

From here, the alignment runs through the Finglas Garda Station where it effectively bisects the current parking area and necessitates the demolition of an existing building structure at the rear of the station as part of the proposed Scheme. At this point, the proposed Scheme will create a new cut-through street linking Cardiff Castle Road to Mellowes Road, with a footpath provided adjacent to and crossing the alignment.

Figure 7-11: 3D Rendered image at proposed Cardiff Road, looking northwards (15 years post-construction date)

Having crossed Mellowes Road via a new signal-controlled junction, the proposed Scheme turns sharply eastwards to arrive at the Finglas Village Stop. The Finglas Village Stop is positioned parallel to Mellowes Road and is incorporated into a new civic plaza which will enhance access to the nearby community facilities. The location of the Finglas Village Stop also facilitates better connectivity with the existing bus services running along Mellowes Road and will provide a more direct visual link to Finglas village centre. Refer to Figure 7-12. A secure cycle parking facility is provided at this location and again, this will accommodate and facilitate cycle-LRT trips.

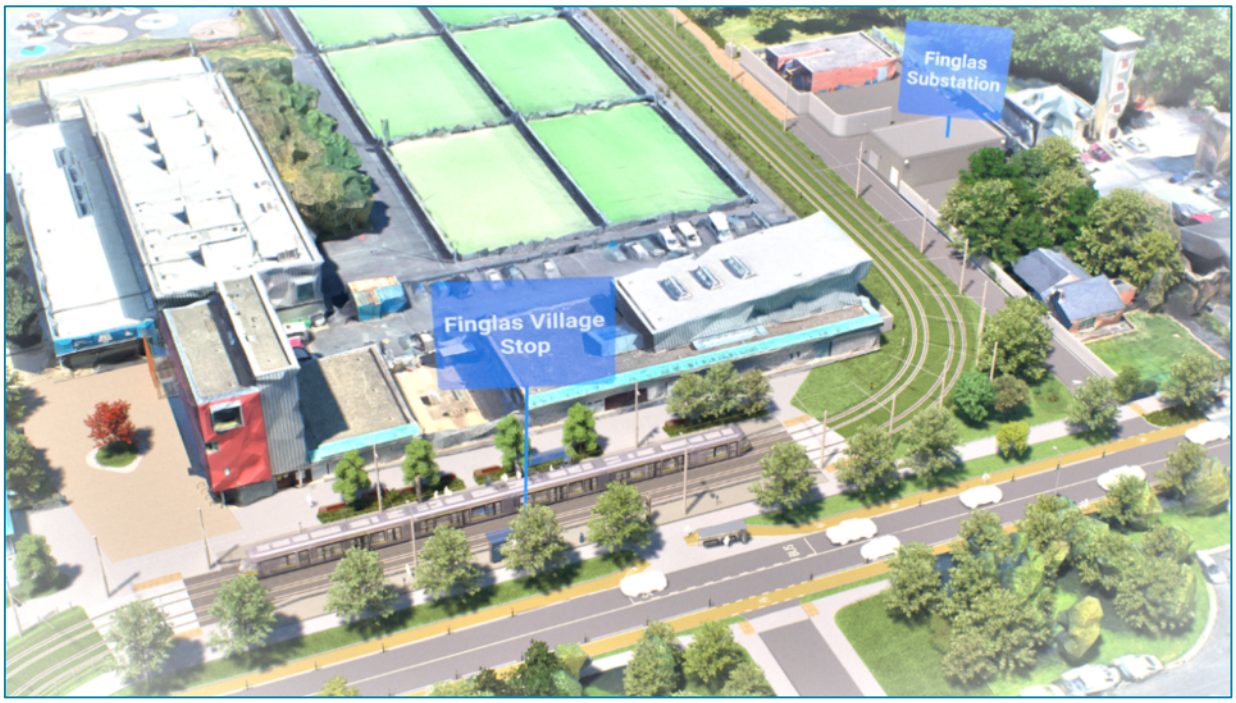

Figure 7-12: 3D Rendered Image at proposed Finglas Village Stop, looking northwards (15 years post-construction date)

Exiting Finglas Village Stop, the alignment turns sharply northwards and continues until it reaches the boundary of Mellowes Park. The alignment curvature necessitates the reconfiguration of an external storage area and the relocation of a boundary fence of the former Park Superintendent's house, now used as a counselling services office. In this area, the second of the two traction substations is located.

7.4 Area 33 - North of Finglas Village Stop to the Terminus (Charlestown Stop).

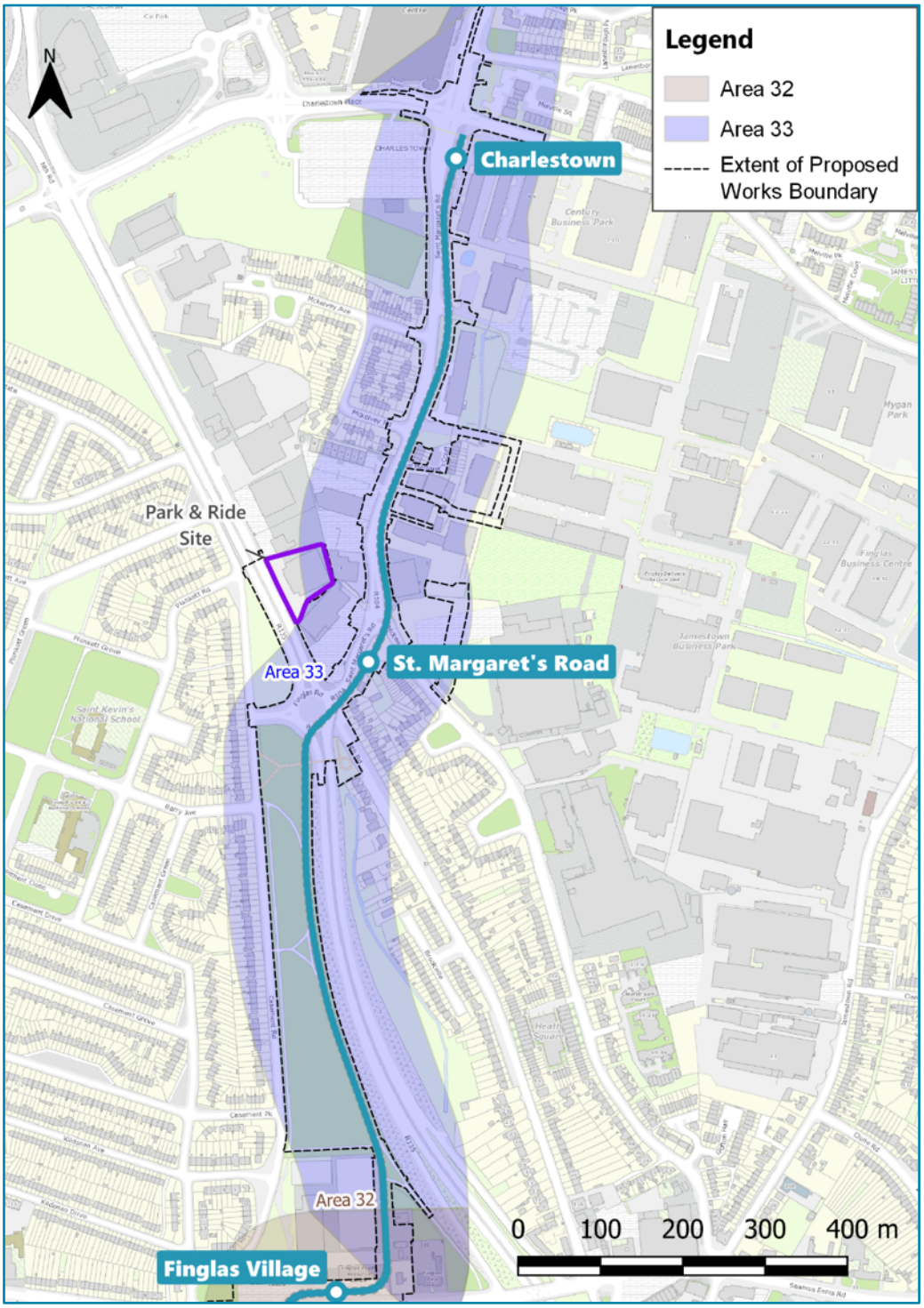

Figure 7-13:Area 33 North of Finglas Village Stop to the Terminus at Charlestown Stop

This area is approximately 1.42km long including St Margaret's Road. There are two Stops in this area: St Margaret's Road and

Charlestown terminus. Refer to Figure 7-13. This area also includes a major road junction with the N2, and the section along St Margaret's Road. A new Park & Ride facility will be established near St Margaret's Road. The proposed Scheme enters Mellowes Park at the southern end next to the existing Uisce Éireann (Irish Water) pumping station. There is a crossover located just south of this point to facilitate turnback of LRV for emergency or operational reasons. The proposed Scheme proceeds northwards on the eastern side of Mellowes Park using a grass track system. A minor adjustment of the soccer pitch in Mellowes Park is required to accommodate the LRT alignment and adjacent footpath. The proposed Scheme then approaches the existing footbridge near the Liam Mellows memorial garden. Refer to Figure 7-14. This bridge is in conflict with the proposed Scheme and becomes redundant with the introduction of the at-grade Finglas Road/North Road crossing and therefore will be demolished.

Figure 7-14: Aerial View of existing bridge at Mellowes Park, looking north-eastwards (source Google Earth)

Figure 7-15: 3D Rendered Image at proposed Mellowes Park, looking northwards (15 years post-construction date)

The Finglas Road / North Road roundabout is reconfigured to provide a signal-controlled junction with the LRT and pedestrian crossings integrated into the signalling sequence. Refer to Figure 7-15. After crossing the Finglas Road / North Road, the proposed Scheme proceeds northwards along St Margaret's Road where the St Margaret's Road Stop is located.

Figure 7-16: 3D Rendered Image at proposed St Margaret's Stop, looking southwards (15 years post-construction date)

The St. Margaret's Road Stop sits between the Finglas Road / North Road junction and McKee Avenue junction. Refer to Figure 7-16. McKee Avenue junction is currently a roundabout and will be changed to a signal-controlled junction. The St Margaret's Road Stop is on a slight curve due to the constrained nature of the site. Space is provided for a public plaza around the Stop and connections to the proposed Park & Ride facility, located across St Margaret's Road. Refer to Figure 7-17. The Park & Ride structure provides accommodation for 350 cars as well as secure cycle parking and features electric vehicle charging, PV panels for electricity generation and a radio antenna. A dedicated substation is provided internally to power the building and the EV charging infrastructure.

The proposed Scheme has also taken account of future connections proposed as part of the Jamestown Business Park redevelopment including an access onto McKee Avenue. A bus interchange is provided for proposed BusConnects routes as well as coach stops on Finglas Road / North Road. Provision is made

for cycle storage and connections to the GDA cycle network proposed by the NTA to further encourage cycle-LRT trips.

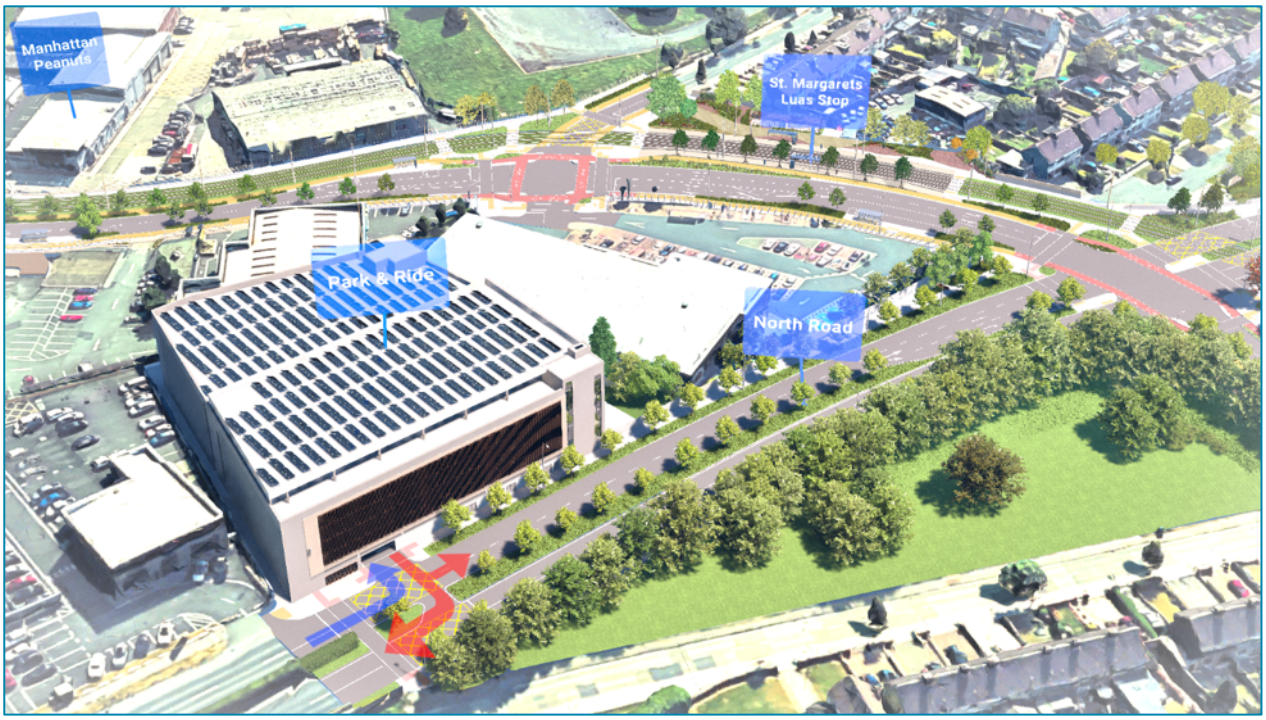

Figure 7-17: Proposed Park & Ride with access /egress arrangements via North Road, looking south-eastwards (15 years post-construction date)

Just south of the Stop is the proposed second substation. This is to be constructed within a residual area of land arising from the proposed demolition of the spiral ramp on the northeastern side of the pedestrian overbridge referred to above. The substation will be accessible via the old North Road which ends in a cul-de-sac adjacent to the site.

An access to the rear of St Margaret's Stop has been provided to facilitate access to land severed by the proposed Scheme. A secure cycle storage facility is proposed at the rear of this Stop.

Having crossed McKee Avenue, the proposed Scheme continues northwards on the eastern side of St Margaret's Road. The need to provide space for increased landscaped areas and cycling facilities means there are property and boundary wall impacts on both sides of the roadway. The proposed Scheme necessitates the demolition

and relocation of an existing electrical substation at Manhattan Peanuts premises. The scheme proposes to remove access from the front of a number of retail premises along St Margaret's Road and a proposed rear access road is included in order to preserve vehicular access to these businesses. These alternative accesses will integrate with the Jamestown Masterplan infrastructure under development by DCC. Refer to Figure 7-18.

Figure 7-18: 3D Rendered Image at proposed St Margaret's Road, looking northwards (15 years post-construction date)

Four private houses at St Margaret's Court will be directly impacted in that their current front parking spaces will be relocated and vehicular access from St Margaret's Road via the side road to the houses behind will be closed. A new alternative access will be provided from the entrance road to the Jamestown Business Park and replacement parking at the rear of the houses will be provided. A small area of green space is to be re-purposed for the additional parking and the original access road to St Margaret's Court will be converted into a cul-de-sac for parking. This junction has an existing offset arm at McKelvey Road and on the western side, a little further north, there is an access to and from McKelvey Avenue.

It is proposed to close vehicular access at McKelvey Road and convert the end of McKelvey Road to a hammerhead turning area. This will significantly reduce the junction complication and signalling phases. Residents' vehicular access to McKelvey Road is preserved via McKelvey Avenue. There are minor impacts on gardens on the western side of St Margaret's and some parking reconfiguration on St Margaret's Road is proposed.

The proposed Scheme continues northwards to cross the access road into the ESBN premises. This access is slightly reconfigured to allow safer crossing of the LRT and to provide some stacking / waiting space for traffic entering and exiting the site.

The proposed Scheme will continue northwards until it reaches the terminus stop of Charlestown, located just south of Melville Road. A set of crossovers switches will facilitate entry or exit to either platform at the terminus. The junction at this location is reconfigured with lane reductions and improved access for pedestrians and cyclists in line with Design Manual for Urban Road & Streets (DMURS) principles. Bus interchange will be provided and there is a proposed cycle parking located next to the Stop again to accommodate and facilitate cycle-LRT trips.

Figure 7-19: 3D Rendered Image at proposed Charlestown Stop, looking eastwards (15 years post-construction date)

SECTION 8: CONSTRUCTION OF LUAS FINGLAS

The programme for the construction of the proposed Scheme has been developed to achieve the shortest Construction Phase possible in order to minimise the duration of potential environmental impacts, while ensuring that the areas surrounding the works sites remain operational and functional.

The construction programme for the proposed Scheme is approximately 1 year of Enabling Works contracts, with the Main Works of the proposed Scheme including testing and commissioning anticipated to take approximately 3.5 years to complete. The total construction timeline for the proposed Scheme is expected to take approximately 4.5 years to complete. The Gantt chart, which illustrates the proposed Scheme's project timeline can be found in Figure 8-2 below.

The construction of the proposed Scheme will include the following activities (Refer to Figure 8-1):

Figure 8-1: Construction Activities for the proposed Scheme

Construction compounds will be put in place in advance of progressing the construction works in the associated areas and will provide facilities both for the Contractor and the Employer's Representatives and facilities for the temporary storage of materials. There will be three principal construction compounds: two located West of Broombridge Road and one located at the Northern extents of Mellowes Park. In addition, there are other secondary site compound locations for small works / storage.

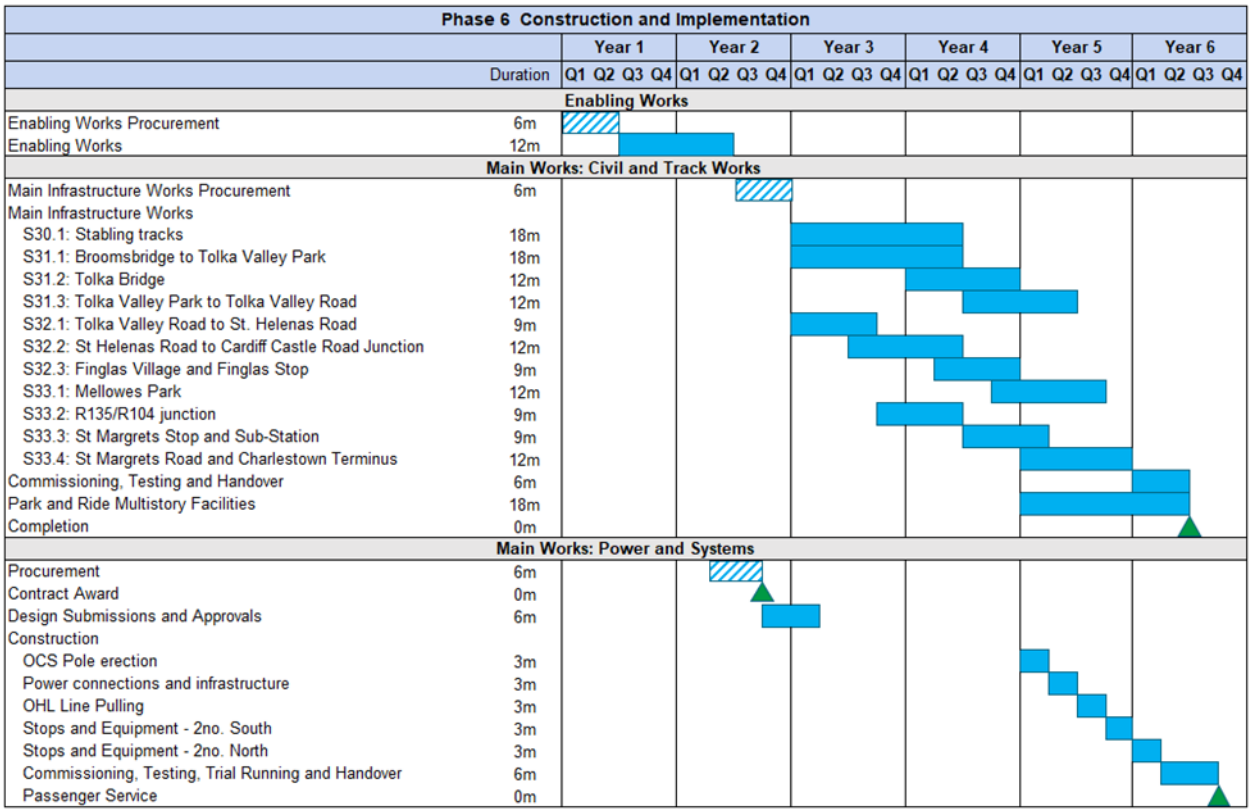

Figure 8-2 Construction Programme

8.1 Construction Health and Safety

All construction work in connection with the proposed Scheme will be carried out in accordance with relevant health and safety legislation and best practice. As required by the Regulations, a Health and Safety Plan will be updated from the current design phase progressively through to the construction and maintenance phases.

8.2 Construction Environmental Management Plan

The Construction Environmental Management Plan (CEMP) describes an overarching framework for the management of environmental impacts during the Construction Phase. It sets out how the construction works can be delivered in a logical, sensible and safe sequence. This plan incorporates specific environmental controls which will ensure environmental protection during the Construction Phase.

Key elements in the CEMP set out in the EIAR are:

- Construction Phase waste management;
- Mitigation measures for storm water and discharge runoff;
- Dust minimisation;
- Ground settlement mitigation measures;
- Construction noise and vibration sources and mitigation measures; and
- Traffic and transport during construction and mitigation measures.

The implementation of the requirements of the CEMP will ensure that the Construction Phase of the proposed Scheme is carried out in accordance with the commitments and mitigation measures set out in the CEMP, which forms part of the EIAR to be submitted to the Board with the RO application.

The CEMP is a live document and will be finalised by the Contractor following appointment and prior to commencing works on site. All the content provided in this CEMP will be implemented in full by the appointed Contractor and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in this EIAR.

Because the CEMP is a live document, the appointed Contractor will ensure that it remains up to date for the duration of the construction period. The CEMP may need to be altered during the lifecycle of the construction period to take account of monitoring results, legislative changes, outcomes of third-party consultations etc. Additional appendices may be added to the CEMP to accommodate monitoring results, permits, etc. However, the finalisation and updating of the CEMP by the appointed contractor will not affect the robustness and adequacy of the information presented here and relied upon in this EIAR.

8.3 Construction Compounds

As part of the preparatory works, construction compounds will be established, including the installation of necessary facilities such as the site office and welfare amenities. Controlled access will be implemented, fencing will be erected, and lighting will be installed. The compound will be secured with Closed-Circuit Television (CCTV) to ensure the safe storage of all materials, plants, and equipment. The CEMP, as discussed above, includes provisions for the proposed construction compounds and will be further developed by the construction contractor before the Construction Phase begins.

8.3.1 Construction Compound Locations

Compound locations have been identified along the route of the proposed Scheme. The Compound locations have been assessed as part of the EIAR for suitability and construction impact assessment. These locations will be seen in Map Figure 2.

Refer to Table 8-1 for the locations of the proposed construction compounds. These are identified as either Primary or Secondary.

Table 8-1 Location of Site Compounds

No. C-31A. Area - Section S31.1. Location : West of Broombridge Road – on southern side of rail and canal crossing adjacent depot entrance. Use Secondary. Compound Size 2036m2.

No. C-31B. Area - Section S31.1. Location : West of Broombridge Road – use of green area to north of railway. Use – Primary. Compound Size 3427m2

No. C-31C. Area - Section S31.1. Location : West of Broombridge Road – use of unit 124 Broombridge Close in the Glen Industrial estate prior to demolition. Use Primary. Compound Size 1522m2.

No. C-31D. Area - Section S31.3. Location : Tolka Park – The Parks Building. Use Secondary. Compound Size 2519m2.

No. C-32A. Area - Section S32.1. Location : Adjacent to St Helena's Stop. Use Secondary. Compound Size 5448m2.

No. C-32B. Area - Section S32.2. Location : Northwest corner of Wellmount Road crossing. Use Secondary. Compound Size 1034m2.

No. C-33A. Area - Section S33.1. Location : Old Park Superintendent's House and land to north next to Finglas Fire station. Use Secondary. Compound Size 1829m2.

No. C-33B. Area - Section S33.3. Location : Northern extents of Mellowes Park. Use Primary. Compound Size 2017m2.

No. C-33C. Area/ Section S33.3. Location : St Margaret's / McKee's Avenue Junction. Use Secondary. Compound Size 948m2.

The Contractor is ultimately responsible for finalising the layout detail of the construction compounds required for the proposed Scheme within the locations identified.

8.4 Enabling Works

The TII procurement for the proposed Scheme includes Enabling Works, which may be carried out as a single or multiple contracts, incorporating mitigation measures from the EIAR and any conditions from the Board's approval. These preliminary works, essential for the construction of the Luas infrastructure and to optimize the Main Works schedule, exclude site preparation works, which will occur later. The Enabling Works, assessed for environmental impacts in the EIAR, encompass several key activities: strategic demolitions (e.g. along Broombridge Road), utility diversions to clear construction paths and provide electrical services to traction substations, mitigation measures for the Tolka Valley Park Integrated Constructed Wetland, reconfiguration of sports pitches at Farnham, and other potential tasks such as road modifications and Garda Síochána building adjustments. Additionally, an off-site tree nursery is proposed to ensure mature landscaping upon the Scheme's completion.

8.5 Working Times

Standard working hours, as set out in Table 8-2, are from 07:00hrs to 19:00hrs on weekdays (excluding Bank and Public Holidays) and from 07:00hrs to 13:00hrs on Saturdays. This includes standard delivery hours to the construction sites.

Table 8-2 Standard Working Times

Days: Monday to Friday. Hours: 07:00 hrs to 19:00 hrs (this includes a half hour to prepare site at each end, giving 11 hours working: 07:30 hrs to 18:30 hrs)

Days: Saturday. Hours: 07:00 hrs to 13:00 hrs (this includes a half hour to prepare site at each end, giving 5 hours working: 07:30 hrs to 12:30 hrs)

Days: Sunday / Public Holidays, including annual and extraordinary events. Hours: None (only by exception - refer to activities listed outside standard working hours)

Standard working times will be included in the Works Requirements and construction will take consideration of sensitive receptors, in particular, any nearby residential areas. Working hours on roads requiring lane closures will be restricted so as to minimise impact on traffic during peak traffic hours. These traffic management restrictions will be included in the Works Requirements.

SECTION 9: OPERATION OF LUAS FINGLAS

Once operational, it is expected that the proposed Scheme will be capable of operating a LRV every 7.5 minutes with an approximate journey time of 30 minutes from Charlestown to Trinity College. The LRVs will operate at speeds, ranging from 15 to 50 kph, with operation times generally from 6am to 1am, with frequency significantly reduced after 10pm. The proposed Scheme will provide a reduction in travel time by approximately 14 minutes in peak travel times when compared to cars. In the long-term, the peak hour headway could be reduced to 5 minutes with 6 additional LRVs on-line. This has been considered in the environmental assessments.

To ensure the proposed Scheme will continue to run effectively, there will be a requirement for regular routine maintenance on the line.

SECTION 10: ENVIRONMENTAL IMPACTS AND MITIGATION

The EIA process provides a valuable opportunity to reduce potential environmental effects through design refinements. The proposed Scheme design prioritises environmental considerations, minimising impact while meeting the project objectives through an iterative design process. Feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development programme have been incorporated where appropriate.

The design of the proposed Scheme has been developed to a stage where all potential environmental impacts can be identified, and a fully informed EIA can be carried out.

The appointed Contractor delivering the proposed Scheme must ensure that all mitigation measures identified in this EIAR are complied with, as well as additional measures required pursuant to conditions attached to any decision to grant the Railway Order. Procurement of the Contractor will involve the determination that the appointed Contractor is competent to carry out the works, including the effective implementation of the mitigation measures.

The EIAR presents an evaluation of the likely significant environmental effects and applicable mitigation and monitoring measures associated with the Construction Phase and Operational Phase, based on the current design. The EIAR will inform the Board's decision regarding the proposed Scheme.

The following sections provide a summary of the assessment of impacts for each environmental topic and sets out the likely significant residual effects as a result of the construction and operation of the proposed Scheme. The following environmental topics are discussed:

- Chapter 7 - Human Health;
- Chapter 8 - Population;
- Chapter 9 - Biodiversity;
- Chapter 10 - Water;
- Chapter 11 - Land and Soils: Soils, Geology and Hydrogeology;
- Chapter 12 - Land Take;
- Chapter 13 - Air Quality;
- Chapter 14 - Climate;
- Chapter 15 - Noise and Vibration;
- Chapter 16 - Electromagnetic Compatibility and Inference;
- Chapter 17 - Infrastructure and Utilities;
- Chapter 18 - Traffic and Transport;
- Chapter 19 - Resources and Waste Management;
- Chapter 20 - Cultural Heritage;
- Chapter 21 - Landscape and Visual Amenity;
- Chapter 22 - Risk of Major Accidents and Disasters;
- Chapter 23 - Interactions; and
- Chapter 24 - Cumulative Impacts.

10.1 Human Health

The human health assessment aims to identify potential health impacts resulting from environmental impacts during the Construction and Operational Phases of the proposed Scheme. Health is influenced by the interaction of factors such as individual characteristics, lifestyle, and the ‘wider determinants of health’ such as the physical, social, and economic environment. Social health inequalities, which are unfair differences in health status across societal groups, are also considered as a related issue. This assessment focuses on how the proposed Scheme may affect these wider determinants and their association with health outcomes.

The assessment evaluates the general health status of the population near the proposed Scheme. At present, Dublin’s population generally enjoys better health than the national average, with lower mortality rates. The Healthy Fingal Strategic Plan 2021-2025 indicates that Fingal's health indicators are at or above the national average. Despite the proposed Scheme passing mostly through green areas, the study area is urban/suburban with high population density, indicating many potentially sensitive receptors that may be vulnerable to adverse health impacts. The assessment adopts a conservative approach and assumes all receptors are vulnerable, paying special attention to healthcare and educational facilities.

This desktop assessment reviews available literature for Fingal and surrounding areas and is also dependent on the outputs of other EIAR assessments where environmental emissions may impact human health. These potential emissions can take the form of noise and vibration, emissions to air, emissions to water, and contaminated soils. Mitigation measures for these environmental impacts will also help reduce associated health effects.

Traffic congestion, especially during peak hours, leads to elevated noise levels for residents along these routes. Although air

emissions increase during peak hours, they generally remain below EU limits for nitrogen dioxide and particulate matter. The baseline environment's annual mean for PM10 (10.6 µg/m³) and PM2.5 (6.5 µg/m³) is 73.5% and 67.5% below the EU limits respectively. The assessment of Construction Phase traffic has found that proposed Scheme will include less than 200 additional heavy-duty vehicle traffic flows per day on the existing road network, meaning there will be no significant construction traffic impact on local air quality.

Temporary traffic congestion due to traffic management measures and diversions will likely cause frustration, particularly for commuters and those travelling to appointments. Construction noise, vibration, and dust may also pose annoyance to nearby residents and workers, but the temporary to short-term nature of these impacts means that no lasting impact on health is likely. The requirement for some works to take place at night, specifically around IÉ property will temporarily increase the likelihood of sleep disturbances for nearby residents due to construction noise. During daytime hours, construction noise also poses a risk of sleep disturbance for shift workers.

The need for pedestrian and cycle diversions around construction works may increase the risk of collisions, as such, the construction traffic management outlines measures deemed necessary to provide protection for pedestrians, cyclists and people with disabilities in each location of the proposed Scheme. Since the construction works will be temporary and short-term overall, subject to the implementation of mitigation measures, the proposed Scheme is not likely to result in any increased exposure to risk for pedestrians and cyclists over and above trends in the current street environment.

The mitigation strategies detailed in the EIAR Chapters will effectively address human health risks without needing additional measures. These strategies include various management plans such as the CEMP, Construction Noise Vibration Management Plan, Construction Traffic Management Plan (CTMP), Dust Management Plan, and Surface Water Management Plan (SWMP). Additionally, monitoring programs for dust, water, noise and vibration will be implemented during the Construction Phase.

No significant health effects are considered likely from the Construction Phase of the proposed Scheme.

During the Operational Phase, the proposed Scheme's potential effects on human health are considered to be positive overall. This is related to the improvement of transport infrastructure, improvement of access to services and reducing social inequalities. Having an efficient public transport system will bring benefits for physical and psychological human health directly and indirectly with a positive contribution due to reduced environmental emissions.

The proposed Scheme creates opportunities for regular physical activity through improved pedestrian and cycling facilities, as well as through walking to and from LRT Stops, leading to positive health outcomes. The provision of public transport with good bus interchanges and improved active travel infrastructure will provide safer and more equitable access for those without cars. It will also bring socio-economic benefits and increase employment opportunities for socially disadvantaged people by offering affordable transport links across the wider GDA. The urban environment would be improved and easier to use for a wider variety of pedestrians, including the visually impaired, wheelchair users and persons with mobility impairment.

Improved journey times and reliability for public transport will enhance mental health by reducing stress and improving access to health, employment, education, and leisure services. Reductions in general through-traffic, improved pedestrian infrastructure, and

streetscape enhancements are likely to encourage social interaction, which will contribute to positive mental wellbeing.

While some residents near new LRT Stops may experience new noise sources, there will be no perceptible change in environmental noise for most people. Measures to reduce noise and vibration for the Operational Phase entails the installation of noise barriers and a ‘floating slab track’ to reduce noise and vibration levels from the operation of the proposed Scheme, where required. With these measures, no significant negative health effects are expected.

No other health impacts or likely health outcomes have been identified as relevant for the Operational Phase of the proposed Scheme.

10.2 Population

The population assessment involves an analysis of the potential impacts on the local population in response to identified environmental and physical changes during the Construction and Operational Phases of the proposed Scheme. The interaction of broader determinates of population (the physical, social, and economic environment) significantly influences the dynamics of population. The aim of this assessment is to identify the broader characteristics of the population which are likely to be affected by the proposed Scheme and the significance of these impacts.

The assessment of local impacts has been undertaken broadly within a corridor of 500m from the alignment of the proposed Scheme, and includes the Electoral Divisions of Cabra West A, Cabra West B, Cabra East A, Finglas South A, Finglas South B, Finglas South C, Finglas North A, Finglas North C and Ballygall A, which are located in the parishes of Finglas, Finglas West, Rivermount and Ballygall. This information has been assessed to determine the impact of the project on residential properties, residential land, community facilities, community land, commercial businesses, commercial land, employment, social economics, and journeys within the Study Area.

The study area is low density residential, but it contains numerous community facilities, businesses and green spaces, including three parks: Tolka Valley Park, Farnham Crescent and Mellowes Park. There are community facilities, including schools and colleges which are located adjacent to the proposed route. Local people will also be able to access community facilities, colleges and places employment far more easily, and in a shorter time, with the implementation of the proposed Scheme.

Surveys, including walkover and Jan Gehl surveys, were used to collect data including age, gender, people moving counts, etc. It was concluded that existing transport infrastructure is not convenient for social interaction. There are numerous physical

barriers which currently make it difficult for pedestrian to access community facilities, especially people with disabilities, older people or people with buggies or prams. Limited connectivity between open spaces and anti-social behaviour are issues in the study area and have been considered in the design of the proposed Scheme.

Data gathered for the population from Census 2022 shows an increase in population of 7.6% compared to the recorded number in Census 2016. Young couples and families with young children predominate, which means that the proposed Scheme will make a major contribution to the transport infrastructure, supporting economic development, employment and social interaction in the future. Due to the inconvenience and longer journey times, people now are currently more inclined to use private vehicles to travel to work, school, or college, rather than public transport. The proposed Scheme will help to build an efficient transport infrastructure and facilitate the lives of people travelling to work, attending school or college, or accessing destinations elsewhere in Dublin, including the city centre, for social or other reasons.

The impacts on population assessed for the Construction and Operational Phases include:

- Indirect amenity impacts during construction on community facilities and commercial businesses from a combination of residual air, noise, traffic, and visual impacts. Direct amenity impacts on commercial businesses that may impact on a business's ability to operate successfully;
- Temporary and permanent land acquisition from residential properties, community facilities and commercial businesses, including reduction of front garden areas, driveways, public and private spaces, and private parking;
- Changes in accessibility for walkers, cyclists, bus users and private vehicles along the proposed Scheme and in the surrounding road network as a result of construction traffic,

diversions and traffic management measures during the Construction Phase and redistributed general traffic during the Operational Phase; and

- Positive contribution to wellbeing of the population after implementation of Luas. The proposed Scheme will contribute to reducing journey time, improvement of transport reliability and north to south connectivity between journey origin and destinations. Existing and new places or employment will be more accessible.

The assessment concluded that there will be no significant negative impacts on any community areas from land acquisition and accessibility during the Construction and Operational Phases of the proposed Scheme. Land take for the proposed Scheme would generally be modest in any one location, but will occur from existing industrial and commercial lands, amenity lands including green space and playing fields, road space, and the Finglas Garda Station car park. There are no plans to demolish occupied residential properties. A Parks Department storage facility, three operational businesses and a building which forms part of the Finglas Garda Station will be demolished.

The proposed Scheme will deliver positive impacts in terms of accessibility to community facilities and commercial businesses for pedestrians, cyclists and bus users during the Operational Phase. The proposed Scheme is also expected to benefit businesses whose workers live along the corridor.

These improvements will help to achieve the aims and objectives of the proposed Scheme by providing an attractive alternative to the use of private vehicles and promoting a modal shift from private vehicles to walking, cycling and public transport (including encouraging cycle-LRT trips), allowing for greater capacity along the corridor to access residential, community and commercial destinations. There will be some negative residual impacts due to the nature of land use in the study area and the challenge of routing

a LRT scheme through an urban area given the established distribution of residential areas and community facilities. The communities of Ravens Court and St. Margaret's Court will be among the most affected by proximity to the proposed Scheme and by changes in access. Changes in access will also impact on some businesses located on Broombridge Road and St. Margaret's Road.

During construction, there will be some severance of parks, green space, footpaths and roads, and associated visual intrusion and noise, that will impact on local people's residential amenity, general amenity, and use of community facilities.

In conclusion, the assessment found that there will be only some short-term significant negative impacts on community areas from land acquisition and accessibility during the Construction Phase. While modest land take will affect some industrial, commercial, and amenity lands, the proposed Scheme will greatly enhance accessibility for pedestrians, cyclists, and bus users, benefiting local people and businesses along the corridor. The proposed Scheme will likewise encourage a shift from private vehicles to more sustainable transport modes. Despite some residual negative impacts during construction, the positive impacts during the Operational Phase will result in a net overall impact that is significantly positive for the people of Finglas.

10.3 Biodiversity

Assessment of habitats has been conducted through a desk-based study within the Zone of Influence (ZoI), followed by field survey and consultation process. A series of ecological surveys, conducted between March 2021 and May 2024 within the ZoI, have provided the necessary data to establish an extensive baseline on the designated sites, habitats, flora and fauna located within and adjacent to the proposed Scheme.

The ZoI for the project is based on a judgement of the likely extent of the ecological impacts on key ecological receptors (KERs, i.e. protected designated site, habitats and species). This will vary for different key ecological receptors (KERs), depending on their sensitivities to environmental change. Each of the KERs has been surveyed in order to identify and assess the potential impacts of the proposed Scheme on biodiversity. Separate Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS) reports have been produced to assess the potential for effects on Designated Natura 2000 sites.

The proposed Scheme area comprises a wide range of habitats, including artificial urban landscapes, amenity grasslands, dry meadows, scattered tree and parkland, mixed broadleaved and riparian woodlands, reed and tall-herb swamps, marshes, hedgerows, treelines and scrub; as well as the Royal Canal and River Tolka.

A total of eight designated European Natura 2000 sites, five proposed Natural Heritage Areas, two Ramsar sites, one Special Amenity Area Order site, and one UNESCO site were determined to be within the ZoI of the proposed Scheme. A diverse range of faunal and floral KERs (Green-listed, Amber-listed, Red-listed, Qualifying Interest and Special Conservation Interest species) were recorded to be present within the ZoI of the development, as well as eight invasive non-native species, five of which are listed on the

Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), S.I. No. 477/2011.

In the absence of mitigation, the potential construction-based impacts anticipated from the proposed Scheme on the existing biodiversity / ecological features within and adjacent to the site are those associated with:

- Direct habitat loss and fragmentation;
- Physical degradation of habitats;
- Disturbance and displacement of protected faunal species (visual and audible);
- Pollution of surface and groundwater networks; air (dust) pollution; and
- The spread of invasive non-native species.

The potential operational impacts anticipated from the proposed Scheme on the existing biodiversity / ecological features are mainly focused on the disturbance and potential displacement and injury of protected faunal species, e.g. bird species such as Light-Bellied Brent Goose and Mute Swan, as well as mammals such as Otter and local Bat species.

While impacts such as temporary habitat loss and fragmentation are unavoidable due to the physical footprint of the proposed Scheme, the remainder of the potential impacts will be mitigated through a series of highly detailed measures. These measures include but are not limited to surface water, groundwater, dust and invasive species management plans as well as seasonal restrictions for vegetation clearance and construction works in sensitive ecological areas. The CEMP includes dynamic plans and mitigation measures, to be updated as necessary by the appointed Contractor, which form the basis of the Operational Phase ecological safeguards. It should be noted that any updates to the mitigation measures by the appointed Contractor will not undermine any mitigation measures in the CEMP at the time of this EIAR

publication, only update measures to better suit changing site conditions.

The proposed Scheme will not result in any residual likely significant effects on any of the designated sites within the ZoI. In relation to the flora and fauna, the Construction and Operational Phase mitigations, along with the landscape plan will ensure that the temporarily / short-term impacted habitats will return to their original condition or an enhanced condition in some cases. Once the ecological lag of the newly landscaped features has passed and the habitats matured, with them offering a full range of ecosystem services for local fauna, the proposed Scheme will have resulted in a slight positive impact on biodiversity present within and adjacent to the site.

In addition, potential impacts on designated European sites are specifically assessed in the Natura Impact Statement, which also forms part of this application. The conclusion of the NIS, following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed Scheme and the effective implementation of the mitigation measures proposed, is that the proposed Scheme will not adversely affect (either direct or indirectly) the integrity of any European sites in view of the site's conservation objectives, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion.

10.4 Water

The assessment of the surrounding hydrological environment included a desk-based study, consultations, field surveys, and analytical water testing to establish the baseline status of the surface water receptors and to ascertain the likely impacts of the proposed Scheme.

The baseline Study Area extends 500m from the proposed Scheme's boundary, encompassing all local waterbodies likely to experience significant impacts on the following attributes: hydrology, hydromorphology and water quality. Key surface water features within the study area include the Finglaswood Stream, River Tolka, Bachelors Stream, Royal Canal, and the Integrated Constructed Wetland at Tolka Valley Park. All except the Integrated Constructed Wetland and the upper extents of the Finglaswood Stream are classified under the Water Framework Directive (WFD) (Directive 2000/60/EC). In terms of designated sites, the Royal Canal pNHA is the only designation within the study area. A further six Natura 2000 sites and five proposed Natural Heritage Areas were considered as part of the assessment due to downstream hydrological connectivity.

In order to determine the baseline water quality, a schedule of surface water and groundwater sampling was conducted between January 2022 and January 2024. The monitoring programme included five surface water locations and six groundwater monitoring locations. The surface water sampling points were chosen at locations along the River Tolka and the Royal Canal. When compared against the relevant surface water regulations, elevated levels of orthophosphate were noted in the River Tolka (SWS003 and SWS004).

An assessment of proposed Scheme’s compliance with the WFD requirements has been undertaken as part of this EIAR. The assessment determined that the proposed Scheme will not compromise the achievement of the objectives of the WFD for any

of the surrounding waterbodies; and it complies with other environmental legislation. It is therefore concluded that the proposed Scheme complies with all requirements of the WFD.

The River Tolka was known to have flooded on previous occasions. To assess the potential impact of the proposed Tolka Valley Park Bridge on the flood extents, a Site-Specific Flood Risk Assessment has been undertaken. Hydraulic modelling of the river confirmed that the proposed bridge crossing will have negligible impacts on the river's flood levels. It was concluded that there is no material increase in flood risk due to the proposed Scheme.

During the Construction Phase, there are a number of construction activities with the potential to result in surface water impacts, including site clearance, earthworks, utility diversions, road resurfacing, junction realignments, construction of the proposed Scheme, construction of watercourse and canal crossing structures, alterations to existing footpaths, establishment of new footpaths and cycleways, and remediation works to the existing Integrated Constructed Wetland in Tolka Valley Park. There will also be a number of construction compounds and haul roads introduced temporarily in order to support the Construction Phase.

In terms of mitigation, a SWMP and CEMP have been prepared. These detail the control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the proposed Scheme. These include a requirement for an environmental incident response plan, sediment control, the management of storage of materials / fuels, management of the batching and use of concrete, and the management of vehicles and plant. There will be no likely significant residual impacts from the Construction Phase of the Scheme.

During the Operational Phase, the majority of impacts are noted to be positive due to the amount of newly introduced SuDS and attenuation features along the scheme. The proposed SuDS

measures has been designed to mimic natural drainage and will provide a range of environmental benefit, encouraging infiltration, attenuation and passive treatment. Operational mitigation measures have been built into the design of the proposed Scheme. A number of different agencies will carry out maintenance of SuDS features in accordance with their respective management procedures. No additional mitigation measures are required.

There will be no likely significant residual impacts for the aforementioned surface water receptors from the Construction or Operational Phase of the proposed Scheme. Designated sites are also predicted to experience negligible impacts as a result of the proposed Scheme.

10.5 Land and Soils: Soils, Geology and Hydrogeology

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

The hydrological assessment identifies and assesses the likely significant effects that the Construction and Operational Phases of the proposed development will have on hydrology.

Both desk-based studies of publicly available information, historic ground investigations and field surveys have been conducted to establish the nature of the receiving baseline environment.

The topography along the proposed Scheme is initially dominated by the Tolka Valley before steadily increasing in elevation as the alignment progresses northwards. The ground surface can be generally described as locally flat with minor undulations. Geological Survey of Ireland (GSI) Quaternary Sediments mapping indicates that limestone-derived till overlies the bedrock geology across much of the proposed Scheme. The land within the study area is mainly used for urban developments, including but not limited to; industrial, commercial, residential, and recreational.

The GSI Groundwater Resources (Aquifers which store / produce water) dataset indicates that the majority of the proposed Scheme is underlain by a 'Locally Important Bedrock Aquifer' that is moderately productive in local zones (LI). A small section, at the most northern end of the route, is underlain by a 'Poor Aquifer', described as generally unproductive except for local zones (PI).

Studies have pointed out that the potential for landslide in the study area is evaluated as low. As such, this issue has not been considered during the EIA. During the ground investigation 2021 - 2022, environmental testing carried out on recovered samples

identified heavy metals, Total Petroleum Hydrocarbon (TPH), Polycyclic Aromatic Hydrocarbons (PAH), Polychlorinated Biphenyls (PCB), Volatile Organic Compound (VOC) and Semi-Volatile Organic Compound (SVOCs) in the soils. The levels reported did not exceed the Generic Assessment Criteria (GAC) for human health in a Public Open Space (Park) scenario. Based on this data, the material is classified as non-hazardous (Class U1).

Land and soils will be impacted by the implementation of the proposed Scheme, especially during the Construction Phase. The impacts include:

- Loss of soil cover, and increased risk of soil erosion and compaction;
- Potentially contaminated soils, geology and groundwater arising from earthworks during construction;
  - Exposure of historic waste deposits during earthworks may result in mobilising potential contaminated material through leaching or surface run-off; and
  - Localised accidental spillages of fuel or chemicals on the site have the potential to contaminate the underlying soils.
- Surplus soil arising from earthworks. Excavation works will produce surplus soil although in relatively small volume and this will have a direct and permanent impact on soils and geology; and
- Risk of encountering contaminated ground, including potential human health and environmental impacts arising from the excavation, handling, on-site processing, transport and off-site disposal and recovery.

Appropriate mitigation measures will be implemented to avoid or reduce negative impacts on land, soils, geology and hydrogeology during the Construction Phase.

It is expected that there will be no significant residual construction impacts on land, soils, geology, and hydrogeology.

The impacts assessed during the Operational Phase, include the potential land, soils, geology, and hydrogeology impacts associated with changes to water supply and the pollution of groundwater and watercourses.

During the Operational Phase of the proposed Scheme no additional mitigation measures are considered for land, soil, geology, and hydrogeology. In this phase the infrastructure will be maintained by TII, or the local authority, who will implement the mitigation measures set out in Chapter 11 (Land and Soils: Soils, Geology and Hydrogeology) of this EIAR to prevent land/soil contamination in event of any accidental spillage.

However, no potential direct impacts associated with the Operational Phase has been identified. Minor indirect impacts may include accidental leaks or discharges at the proposed extension of the Luas Broombridge Hamilton depot, car parking areas and maintenance compounds, which could result in potential contamination of soils and groundwater. As the Luas is an electrified transport system, the operational contamination risks are significantly lower, compared to transport vehicles powered by internal combustion engines and hydrocarbon fuels, and mitigation measures put in the design of the track greatly reduce this concern.

There are no likely significant residual impacts on the land, soils, and hydrogeological environments as a result of the proposed Scheme, from either the Construction or Operational Phase. Analysing the impacts and the mitigation measures, it is concluded that all of the potential impacts (both during Construction and Operational Phases) are predicted to be reduced to neutral quality and negligible magnitude. As such, the significance of the impact on the identified attributes are imperceptible.

10.6 Land Take

The land take assessment involved desktop research and analysis of existing documentation to identify property types and uses along the proposed Scheme which will be directly impacted upon. This was supplemented by on site surveys and walkovers. This assessment covers the impact of the proposed Scheme on residential, industrial, commercial, community, amenity and public areas located along the route, and in particular, those properties which will need to be acquired and or will be impacted by the proposed Scheme.

The assessment concluded that there are 66 property owners directly affected by the proposed Scheme with a total of over 340 stakeholders considering leaseholders and tenants. The individual plots include 19 residential properties, nine industrial properties, 15 commercial properties, 16 community property owners and four vacant potential development sites. Some temporary land take will be used for construction compounds, crane operation areas and material storage.

Predicted impacts during the Construction Phase are related to acquisition of properties on a temporary basis, acquisition of properties on a permanent basis and demolition of structures. During the Construction Phase of the proposed Scheme, a total of 307,411.3$m^2$of land lies within the Scheme site extents boundary, including public roads, a total of 170,625.5m^2 is to be acquired temporarily to accommodate construction compounds and construction activities (including enabling works, demolition, excavations, traffic diversions, Luas Stops and Park & Ride construction). A total of 53,490.5m^2 is to be acquired permanently to accommodate the proposed Scheme.

Land Take Impacts include:

- Permanent and temporary land take for use as construction compounds, for track / bridge construction, utilities relocation, provision of cycle storage facilities and substations;
- Permanent reduction in residual land area;
- Temporary and permanent deviation of access/Entrances. car parking, boundary fences, hardstanding and yards in Industrial/ commercial premises;
- Temporary interference of public rights of way and private access;
- Permanent and temporary reduction in residential and community land, boundary wall relocation. Impact on residential and community gardens/Parks;
- Demolition of existing industrial buildings and boundary fences/wall, Parks storage buildings, pedestrian overbridge and ESB substations;
- Permanent land take for the construction of the Park and Ride facility;
- Relocation and changes to soccer and Gaelic football pitches;
- Tree removal and creation of landscaped areas including footpaths and cycle ways; and
- Modification and realignment/deviation of existing roads.

Mitigation measures to minimise the impacts on temporary land take required for construction activities have been incorporated in the design. Temporary land take required for construction activities has been minimised wherever possible and boundaries adjusted to avoid or minimise impacts as far as possible.

With this series of measures put in place, it is concluded that no additional measures are required during the Operational Phase. It is assessed that there will be no residual effects on properties associated with Land Take during the Operational Phase.

10.7 Air Quality

The air quality assessment involved a review of available published data, a review of applicable guidelines, air quality monitoring at sensitive locations along the proposed Scheme and calculations to assess the air quality impacts that are predicted to occur as a result of the proposed Scheme.

The existing air quality along the proposed Scheme meets National and European Union air quality standards.

Various construction activities may impact the air quality as a result of dust emissions and the potential for nuisance to sensitive receptors in the study area. The type of construction activities that could cause fugitive dust emissions are demolition; earthworks; handling and disposal of spoil; wind-blown particulate material from stockpiles; handling of loose construction materials; and movement of vehicles, both on and off site. Weather conditions are a factor that effect dust generation, but the rates of emission depend on the area and scale of site activity, particle size and the moisture content of the material. During periods of dry and windy weather, particles can become airborne and disperse in excess of 100m from source. Due to the scale of the proposed Scheme construction, sites will be in operation for extended periods and therefore, a detailed consideration of potential dust impacts has been assessed qualitatively. Appropriate construction dust mitigation measures to ensure that construction dust nuisance is minimised have been outlined. Appropriate construction dust mitigation measures will be implemented for the duration of the Construction Phase.

As the proposed Scheme is electrified, there will be no air pollutant emissions from its operation to appraise. Therefore, the direct air quality impact during the Operational Phase will be not significant. During the Operational Phase, the most significant potential air quality impact will be associated with altered traffic flows due to the Park & Ride facility at St Margaret's Road. The potential air quality impacts due to altered traffic flows in proximity to selected sensitive

receptor locations has been assessed. All ambient air pollutant concentrations will remain in compliance with the ambient air quality standards and therefore no specific Operation Phase mitigation measures are required.

With the implementation of the mitigation measures set out in the CEMP the effects of emissions from the proposed Scheme construction will be neutral, not significant and medium-term. The Contractor will provide for regular air quality monitoring during the construction period to confirm the effectiveness of the mitigation measures and where necessary corrective action shall be taken.

Considering the likely effects of emissions due to altered traffic flows on the surrounding road network, the likely effects from the operation of proposed Scheme will be neutral, not significant and long-term.

10.8 Climate

Climate change is a significant change to the average weather over a period of time. While climate change is a natural phenomenon, human activities are negatively impacting on the climate, through the release of GHGs. The Climate assessment involved a review of baseline GHG emissions, a review of applicable guidelines, predictive calculations to predict emissions arising from the proposed Scheme for the Construction and Operational Phases and an assessment of potential climate impacts. Also, the proposed Scheme was assessed in terms of its vulnerability to climate change.

GHG assessment has been undertaken by using TII's carbon calculation tool. This tool is used for assessing lifecycle carbon emissions for national road and light rail infrastructure projects in Ireland. Potential changes in GHG emissions associated with changes in road traffic volumes within the study area due to the Operational Phase has also been considered.

During the Construction Phase, the potential impacts are with respect to embodied carbon used for the construction of the proposed Scheme, embodied GHG emissions arising from land clearance activities, embodied carbon from materials and transport, and waste production.

The total estimated carbon generated during the Construction Phase is 54,430.2 tCO_{2eq}, with various mitigations incorporated into the proposed Construction Phase activities. Ireland's carbon budgets have been used to contextualise the magnitude of GHG emissions from the Construction Phase of the proposed Scheme. To put the total Construction Phase emissions of 54,430.2 tCO_{2eq} in context versus the 3rd Carbon Budget (2031-2035) of 151 Mt CO_{2eq}, the GHG emissions (tCO_{2eq}) contribution due to the Construction Phase of the proposed Scheme will be 0.036% of the carbon budget emissions.

During the Operational Phase, there are two significant sources of GHG emissions, firstly the operational power requirements for running the Broombridge Depot, Stops, the Park & Ride facility, and the power system, and secondly road traffic related emissions. By installing a solar photovoltaic (PV) panel array on the Park & Ride facility roof, the electricity generated will equate to a saving of approx. 96 tCO_{2eq} per annum or 5,760 tCO_{2eq} over the lifetime of the project. The GHG emissions contribution due to the Operational Phase of the proposed Scheme, if annual estimated emission is put in context versus 3rd Carbon Budget (2031 – 2035) of 151 Mt CO_{2eq}, will be 8,802.8 tCO_{2eq} / annum, 0.029% of the carbon budget emissions.

The predicted impact on climate due to the overall reduction in road traffic GHG emissions during operation is long-term and positive.

Mitigation measures have been incorporated into the construction design aimed at reducing the embodied carbon associated with the Construction Phase of the proposed Scheme. These measures include the reuse of materials and soil as much as possible; maintaining existing tree corridors where possible to minimise tree clearance; incorporation of concrete with 25% or 50% ground granulated blast furnace slag (GGBS) to reduce the carbon footprint, the use of non-concrete assets such as grass track to minimise the need of concrete.

The proposed Scheme provides sustainable public transport that significantly reduces the use of private cars and therefore, reduces road transport and vehicle emissions. This represents a significant contribution towards the national target of 500,000 additional trips by walking, cycling and public transport per day by 2030, as outlined as a target in the CAP24 and the proposed Scheme aligns with and supports the objectives of CAP24.

Based on the analysis conducted, it is concluded that the proposed Scheme achieves the project objectives in supporting the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets. The proposed Scheme will deliver an increase of 1.3 million low carbon public transport trips per annum in the opening year 2035 and an additional increase of 13% in 2050. It is concluded that the proposed Scheme will make a significant contribution to reduction in carbon emissions.

10.9 Noise and Vibration

The noise and vibration assessment involved a review of available published baseline noise data, the completion of baseline noise and vibration monitoring to establish the current background levels, and a detailed noise and vibration impact assessment associated with the Construction and Operational Phases.

The baseline surveys determined that currently the main source of noise within the study area is road traffic with a small contribution from local urban and suburban sources such as pedestrian movements and commercial activities. Elevated noise levels are particularly noticeable on St Margaret's Road and the junction of Broombridge Road / Ballyboggan Road.

There are no notable sources of vibration in the surrounding environment. Road traffic, along with the occasional train movements on the tracks below, recorded the maximum but negligible levels of vibration.

The impacts assessed for the Construction Phase included the generation of noise and vibration from utility diversions, demolitions, earthworks, principal structure works and road / track works. Construction traffic routes were also assessed as part of the assessment.

For the duration of the Construction Phase, appropriate mitigation measures will be implemented, including the selection of a quieter plant, the consideration of the construction working hours, the appropriate use of acoustic enclosures or screens where required, and the monitoring of vibration at identified sensitive receptors, where proposed works have the potential to be at or exceed the vibration limit values.

Following the application of these mitigation measures, it is expected that there will be no significant residual noise or vibration impacts, as a result of the Construction Phase of the proposed Scheme. However, there are a few construction activities that will result in potentially moderate to significant impacts for brief periods when works are immediately adjacent to sensitive properties (e.g. St Helena's Childcare Centre).

The impacts assessed during the Operational Phase relate to circulation of the LRVs operation, operational and maintenance activities, car parking, plant and traffic noise at the Park & Ride facility and changes in road traffic noise levels along the proposed Scheme as a result of predicted changes in traffic movement in the surrounding road network.

Noise mitigation is required at St Helena's Childcare Centre to reduce the airborne noise at this location. A new solid boundary treatment is to be installed, with a minimum height of 2.25m, offering suitable sound attenuation. The boundary treatment will be constructed from a suitable dense material such as masonry or solid timber fencing, offering suitable sound attenuation.

Following the application of these mitigation measures, it is expected that there will be no significant residual noise or vibration impacts, as a result of the Operational Phase of the proposed Scheme.

10.10 Electromagnetic Compatibility and Interference

Electromagnetic Compatibility (EMC) relates to the ability of different electrical (magnetic) devices to function properly when they are subject to elevated levels of electromagnetic interference (EMI) and stray current. The proposed Scheme will generate three types of electric and magnetic fields known as; Direct Current (DC) fields (generated by train power); Alternating Current (AC) fields (generated by the electricity drawn from the Electricity Grid); and Radiofrequency (RF) fields (generated by radio systems).

An initial high-level desktop survey was undertaken to help identify the potential 'hot spots' and locations where EMI baseline measurements were to be carried out. Following desktop survey and based on their results, walkover survey has been conducted for the purpose of identifying suitable measurement locations and any hazards associated with the measurements.

A substation at the Park & Ride facility is proposed to be added to supply electric vehicle charging stations. It is assessed that emissions from the substation at Park & Ride facility will not be significant. Radiated emissions measurements have been done to determine the baseline electromagnetic environment in which the proposed Scheme is required to operate. In general, the background levels are below the limit lines. Measurements were also carried out for the 50Hz electric and magnetic field levels parallel to and under the 100kV overhead lines where the new LRT will run. The results indicated that the levels are compliant with exposure limits for people. Surveys for the soil resistivity carried out at the new substation locations concluded that the resistance values were low which means that the location proposed for the substation is suitable to design and install an Earthing system for a traction power substation.

The most sensitive receptors to EMI along the proposed Scheme alignment include research facilities (universities and third level institutes), scientific institutions, medical centres, and hospitals.

No impacts from an EMI, Electromagnetic Fields (EMF) or stray current perspective are likely to occur during the Construction Phase of the proposed Scheme. The significance of the impacts from electromagnetic emissions and stray current on sensitive receptors identified will vary from imperceptible to slight while the quality of effects will be neutral. Therefore, there are no specific mitigation measures required during the construction of the proposed project. A change to the baseline Electromagnetic environment from RF emissions of on-site communications equipment or AC emissions from local power generators is likely significant and will be constant during the Construction Phase. However, the duration of these effects will be medium-term.

During the Operational Phase, the impacts include transient emissions generated by LRT system which can pose a risk to the operation of nearby electrical and electronic equipment. Also, stray currents along the alignment could impact on buried utility pipes and / or cables if not mitigated. Large electrical installations can also cause voltage fluctuations on the public supply that cause the phenomenon of flicker when not mitigated correctly.

Appropriate mitigation measures include the use of a stray current collector system, improvement of the return circuit (high conductivity in the rails) and isolation of the return circuit from ground (rail-to-earth resistance). The use of a slab track helps facilitate some of these measures, e.g. cross-bonding the top layer of reinforcing steel of the slab helps improve the return circuits conductivity.

Once in operation, monitoring of the earthing system and stray currents will be performed to ensure that potential faults in these mitigation measures or degradation over time is adequately detected.

During the Construction Phase, there will be no residual impacts remaining. During the Operational Phase, following the implementation of mitigation measures, the residual impacts will be

reduced. Continued mitigation measures to minimise stray current and continued monitoring of the power system will be required. Periodic monitoring of nearby buried structures and pipes to indicate potential changes in the stray current environment will also be required.

10.11 Material Assets: Infrastructure and Utilities

The material assets (infrastructure and utilities) assessment was considered in terms of:

- Gas transmission and distribution pipework;
- Potable water mains;
- Foul or combined sewers;
- Surface water sewers;
- Electricity transmission and distribution networks (underground cables and overhead lines); and
- Fibre telecommunications.

Information on major infrastructure and utilities along the proposed alignment has been collated to understand their location and function to avoid any clashes with the permanent and temporary works required for the proposed Scheme.

The utilities and infrastructure were then assessed in terms of the sensitivity of each to disruption and the predicted disruption. This assessment included a desk-based review of these material assets. Existing utility information was requested from relevant organisations and service providers and utility investigations have been carried out.

Information collected determined that most of the existing infrastructure and utilities alongside or crossing the proposed Scheme are underground. Others are overhead cables along the route. Existing utilities within the site of the proposed Scheme include:

- ESBN with both service types, transmission and distribution;

- Gas Networks Ireland with both service types, transmission and distribution;
- Uisce Éireann with Potable water and sewer lines services;
- Local Authorities (DCC / FCC) with Surface Water Sewer Networks and Traffic Signals services; and
- Telecommunications with various services like Virginia Media, Eir, BT and other.

The main construction elements that are likely to result in potential impacts on material assets will include:

- Stops, tracks, substations, ancillary roadworks and paved areas;
- Structures;
- Park & Ride facility;
- Earthworks;
- Diversion of Utilities where there will be interfaces with the proposed Scheme works (i.e. gas, electricity, water mains, wastewater sewers, communication infrastructure, rail infrastructure); and
- Construction compounds (e.g. Broombridge).
  - The Construction compounds will require electricity to power temporary office and welfare facilities and for temporary lighting which will be required to be supplied via a connection to the grid network or a generator.
  - The Construction compounds will require a water supply for welfare facilities, as well as for dust suppression.
  - The Construction compounds will require a wastewater and surface water runoff which will be required to be connected to the local foul sewers or on-site tankers.
  - The Construction compounds will require telecommunications access.

The proposed Scheme has been designed to minimise the impact on utility infrastructure. This includes avoiding interactions with major utility infrastructure, wherever possible. Where there are interfaces with existing utility infrastructure, these will be protected

in place or diverted as necessary to prevent long-term disruption to services. Diversions and changes to the location or layout of any utility infrastructure have been accounted for in the overall design of the proposed Scheme and agreed in principle with the utility providers during consultations.

Where diversions are required and service disruptions to the surrounding properties are unavoidable, this will be planned with prior notification given to all the impacted property owners. All possible precautions will be taken to avoid unplanned disruptions to any services during the Construction Phase.

Proposed utility works are based on available records, and preliminary site investigations. Prior to excavation works being commenced, localised confirmatory surveys will be undertaken to verify the results and pre-construction assessments undertaken and reported in this EIAR. Where works are required in and around known utility infrastructure, precautions will be implemented to protect the infrastructure from damage such as warning signs and markings indicating the location of utility infrastructure, safe digging techniques in the vicinity of known utilities, and in certain circumstances, isolation of the section of infrastructure during works in the immediate vicinity.

With the implementation of the proposed mitigation measures there will be moderate to slight residual impacts on material assets (infrastructure and utilities) as a result of the construction of the proposed Scheme.

The main operational elements that are likely to result in potential impacts on the utilities will include:

- The requirement for future utility maintenance or diversion activities; and
- The requirement for electricity connections for new street lighting, junction signalling or other information systems.

There will be no significant Operational Phase impacts on utility infrastructure. Due to the measures included in the design of the proposed Scheme and the fact that there are minimal impacts predicted during the Operational Phase, no specific mitigation measures are required.

10.12 Material Assets: Traffic and Transport

The traffic and transportation impacts have been broken down into the following assessment topics for both the Construction and Operational Phases:

The qualitative assessments:

- Pedestrian Infrastructure: The changes to the quality of the pedestrian infrastructure as a result of the proposed Scheme;
- Cycling Infrastructure: The changes to the quality of the cycling infrastructure as a result of the proposed Scheme; and
- Bus Services: The changes to the routing of bus services as a result of the proposed Scheme.

The quantitative assessments, which have been undertaken using traffic and transport modelling tools:

- People Movement: An assessment has been carried out to determine the potential impact that the proposed Scheme will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the proposed Scheme during the Operational Phase only;
- Public Transport Performance Indicators: The changes to the projected public transport journey times and boardings as a result of the proposed Scheme; and
- General Traffic: The direct and indirect impacts on general traffic as a result of the proposed Scheme on the surrounding road network.

Desk-based research together with field survey data collected has provided a baseline of information for traffic and transport. Transport and commuting along the proposed Scheme is dominated by private car-based transport. There is a lack of controlled pedestrian infrastructure, and cyclists are expected to share traffic lanes in both directions. No bus lanes are currently in operation along this route. Generally, the roads are single carriageway roads with one lane travelling in each direction.

People's day-to-day activities will be impacted by the construction works undertaken for the proposed Scheme. Some of the most likely impacts include:

- Pedestrians' infrastructure;
- Cyclists' infrastructure – closure of cycle lanes;
- Bus Services – changes to the routing of bus services or temporarily relocation of some bus stop's locations;
- Temporary disruption or alterations to the parking spaces and access to premises along the roads under works may occur; and
- Temporary lane closure at some locations with a resulting impact on the existing traffic.

For the Construction Phase, temporary traffic management arrangements will be in place to take consideration of the phasing requirements of the proposed Scheme which will ensure safe construction and minimise the impact on traffic on non-motorised users (NMUs) along the route of the proposed Scheme and maintaining flow of all modes of transport wherever practicable. These traffic management arrangements will be implemented as set out in the CTMP prepared as part of this EIAR. Measures to minimise the impacts associated with the Construction Phase will be implemented as set out in the CEMP prepared as part of this EIAR.

The assessment concludes that the impact during the Construction Phase will be negative, moderate, and temporary in nature, and with the application of the proposed mitigation measures, the impact on traffic and transport will not be significant.

During the Operational Phase, the proposed Scheme will lead to a significant reduction in journey times for residents in the area and support an increase in public transport usage. In the opening year 2035, the proposed Scheme will deliver an increase of 1.3 million low carbon public transport trips per annum. This represents an 11% increase in public transport trips due to the delivery of the proposed Scheme. Overall, the proportion of people travelling via

sustainable modes (Public Transport, Walk, Cycle) will increase with the delivery of the proposed Scheme. It will ensure a reliable public transport service offering journey times of 30 minutes from Charlestown to Trinity College.

The reductions in general traffic flows have been assessed and have a positive impact to the environment. The results of the assessment demonstrate that the surrounding road network largely has the capacity to accommodate the redistributed general traffic as a result of the proposed Scheme.

The assessment has shown a positive, significant to very significant and long-term effect for walking, cycling, public transport and people movements during the Operational Phase.

Following the implementation of the mitigation measures, the Construction and Operational Phases of the proposed Scheme will result in a range of imperceptible to slight negative residual impacts within the study area. No moderate or significant residual negative impacts are predicted following the implementation of appropriate mitigation measures.

10.13 Material Assets: Resource and Waste Management

This waste and resources assessment included identifying the types of waste that could be generated by the proposed Scheme, as well as the potential for reuse of materials. This assessment was informed by a desk-based study including identification of the types of waste that could be generated by the proposed Scheme, a review of existing and proposed waste management facilities as well as the potential reuse of materials.

Additionally, sustainable waste and resource management principles have been incorporated into the design of the proposed Scheme and these principles will also be applied in line with the Waste Hierarchy Model throughout the Construction and Operational Phases. This will ensure that waste generation will be minimised.

The main construction elements that are likely to result in potential impacts on waste and resources will include site clearance and demolition of buildings and structures including the pedestrian overbridge at the Finglas Bypass Road. It has been identified that the construction and demolition waste and excavated material generated by the proposed Scheme will be primarily inert and non-hazardous waste such as concrete, bricks, metal and glass. However, it has also been predicted that small volumes of hazardous waste including asbestos, bituminous soils, chemicals, and waste electrical and electronic equipment may be identified.

Large quantities of soil, stone, and made ground are predicted to come from earthworks and shallow excavation. All stripped (excavated) topsoil is intended to be reused. Almost 58 % of the total volume of excavated material will be classified under Article 27 non-compliant surplus as waste and include inert, non-hazardous and hazardous.

The predicted impact of demolition, excavation, and construction waste during the Construction Phase, prior to mitigation, is identified to be moderate and short-term.

A range of mitigation measures will be implemented to avoid or reduce negative impacts on waste and resources during the Construction Phase, including that of minimising waste disposal. Opportunities for reuse of materials, byproducts and wastes will be sought throughout the Construction Phase of the proposed Scheme. This will be managed through the Construction Phase by implementing the Construction and Demolition Resource and Waste Management Plan.

The main potential impacts on waste and resources during the Operational Phase will be waste generated from municipal solid waste at the Broombridge Hamilton depot, Luas stops and offices, maintenance activities and Waste from Electrical and Electronic Equipment and appliances. The predicted impact of resources and waste management and resources at stations and during maintenance are predicted not to be significant in the context of the proposed Scheme during the Operational Phase.

As a result of the mitigation and control measures put in place, it is expected that there will be no residual significant impacts on waste and resources during the Construction and Operational Phase of the proposed Scheme.

10.14 Cultural Heritage

Cultural heritage assessments address the preservation and understanding of cultural heritage constraints. This process involves evaluating potential impacts of a project on these constraints, outlining measures to safeguard cultural heritage during development.

This assessment was based on publicly available information, consultation with relevant bodies, field inspections, archaeological investigations, including monitoring invasive works, targeted testing, a wade survey of the Royal Canal and Tolka River and condition surveys of the Broome bridge, and Finglaswood Bridge.

Cultural heritage background information from prehistoric times up to the present day has been reviewed to have a full baseline of constraints. The cultural heritage constraints identified within the study area varied from High importance to Neutral importance. The following cultural heritage constraints were identified:

- Fourteen cultural heritage constraints of High importance including town defences, a historic town, a monastic enclosure, houses, wells, bridges, canal, etc.;
- Fourteen cultural heritage constraints of Medium importance including three Areas of Archaeological Potential, conservation areas, railway structures, religious building, memorials, one sculpture, etc.;
- Fourteen cultural heritage constraints of Low importance including railway structures, LRT poles reused as light poles, one quarry with no surface remains, and one levelled townland boundary in a potentially undisturbed area;
- Ten cultural heritage constraints of Very Low importance have been identified in disturbed/modified areas within the study area. These include seven sites of buildings, one site of a well, and four Areas of Archaeological Potential; and
- Fifteen levelled cultural heritage constraints of Neutral importance have been identified in very disturbed / modified

areas within the study area. These include townland boundaries, a quarry, two sites of buildings, and one demesne feature.

Direct impacts during the Construction Phase of the proposed Scheme would potentially arise as a result of the following:

- Ground disturbance due to earthworks and excavations;
- Partial, permanent demolition resulting in physical loss of complete/partial loss or severance of a constraint;
- Temporary, short-term or medium-term removal of a constraint, such as statues and memorials, during construction and their replacement in the same location or nearby on the completion of the works;
- Ground borne vibration during construction activities; and
- Nearby construction activities.

Mitigation measures will be prepared and applied for the identified predicted impacts on cultural heritage constraints. They will aim to preserve in their original place any cultural heritage constraints which will be impacted by the development of the proposed Scheme. The mitigation measures proposed include the provision for and funding of the necessary archaeological monitoring, inspection and excavation works that will be required prior to and during construction. The section of the bridge structures adjacent to works will be protected by hoardings and signage during all works to prevent plant and machinery impacts.

No direct impacts to cultural heritage constraints will occur during the Operational Phase. Indirect impacts during the Operational Phase of the proposed Scheme will be permanent and may include visual impacts on constraints.

The residual impacts after mitigation have been implemented throughout the Construction Phase are considered to not be significant. Slight to Moderate negative indirect residual impacts have been identified for the Operational Phase as a result of Royal Canal and Rail Overbridge construction.

10.15 Landscape and Visual Amenity

The landscape and visual assessment are informed by data collection and collation based on initial desk studies, supported by site walkovers and augmented by further specific localised reviews along the corridor of the proposed development. The survey also involved the selection and preparation of verified Photomontages of the proposed Scheme, which are presented in Volume 5 of this EIAR.

Ten Local Landscape Character Areas (LLCA) have been defined and assessed by the Luas Team. These LLCAs reflect the local-scale changes in vegetation and built environment and the presence of elements of landscape sensitivity. Landscape sensitivity elements are designated landscapes (including scenic, cultural heritage and ecological), valued open space areas, vegetation, and watercourses, which together give each area an overall landscape character.

A qualified Arborist has undertaken a Tree Survey and has prepared an Arboricultural Impact Assessment, and a Tree Protection Plan. The assessment has indicated that 178 individual trees are required to be removed from a total of 1,037 individual trees surveyed, in order to facilitate the proposed Scheme. Additionally, a number of small trees (163) which are below 75mm diameter in trunk size will also be removed to facilitate construction of the proposed Scheme

The proposed Scheme alignment passes through open green spaces, various of parks and along roads with mixture of views of residential and commercial areas. The proposed tracks will be low to the ground, meaning that the main visual intrusions will be the LRVs themselves, the Stops, and the overhead contact systems (OCS). Cultural heritage features that are above ground have been assessed in terms of landscape and visual amenities impacts.

The main potential landscape and visual impacts during the Construction Phase will include:

- Site mobilisation and establishment, fencing and hoarding of the construction compounds and works areas - including within private areas / gardens;
- Site demolition, including removal of boundaries, kerbs, verges, surfaces, landscape areas, trees, and plantings – including boundary fences, walls, and plantings within private areas / gardens;
- Site activity and visual disturbance from general construction works and the operation of construction machinery both within the site and at the construction compounds;
- Construction works involving diversion of existing underground / overground services and utilities, provision of new services and utilities, drainage features and connections, etc.;
- Site activity and construction works involved in the construction of new carriageways, kerbings, footpaths and cycleways, bus stops and signage, reinstatement of boundaries / provision of new boundaries and landscape reinstatement works / provision of new landscape, etc.; and
- Decommissioning of works areas and the construction compounds.

The range of receptor sensitivity in LLCAs varied from low to high. During the Construction Phase, the receptors with high sensitivities are assessed to be located within the Royal Canal LLCA and Tolka Valley Park. The impact on these landscape characters and visual amenities will be moderate to significant, temporary, and negative. Farnham Park LLCA, Wellmount Road, and Mellowes Park LLCA have a medium sensitivity, and the impacts are considered to be slight, temporary and negative. All the other LLCAs are assessed as low sensitivity, and the significance of the effects will be imperceptible to slight, temporary and negative. The impacts from the LLCA assessment results are to be temporary due to short-term of the construction activities.

Appropriate measures to avoid or reduce negative landscape and visual impacts during the Construction Phase will be implemented, including ensuring that trees and vegetation to be retained, within and adjoining the works area, will be protected. Works required within the root protection area of trees to be retained will follow a project-specific arboricultural methodology for such works.

After the Construction Phase is finished and the proposed Scheme is in operation, the overall impacts on landscape characters and visual amenities in this phase are considered to be positive and permanent. The sensitivity of the Royal Canal LLCA area and Tolka Valley Park character area will remain high due to the introduction of 'uncharacteristic new element or feature that would lead to an overall change in landscape character and quality'. However, the change of the quality of the landscape will impact in a positive way.

Following implementation and establishment of mitigation measures the landscape, townscape, streetscape and / or visual receptors assessed as having post-mitigation residual negative impacts of moderate or greater significance. There will be a reduction in magnitude and severity of the proposed Scheme in the Royal Canal LLCA and Tolka Valley Park LLCA. The residual impacts for these two areas will be moderate, negative, and permanent. Overall, the residual impact of the proposed Scheme on landscape character and visual amenities is considered Positive and Permanent.

10.16 Risks of Major Accident and Disasters

This assessment considered the potential significant negative impacts of the proposed Scheme on the environment, resulting from its vulnerability to risks of major accidents and / or disasters during the Construction Phase and Operational Phase.

The risk assessment:

- Identified major accidents and / or disasters (i.e. unplanned incidents) that the proposed Scheme may be vulnerable to; and
- Assessed the likely impacts and consequences of such incidents in relation to the environmental, social, and economic receptors that may be affected.

A register of all potential unplanned risks and the associated potential impacts was developed for the Construction and Operational Phases of the proposed Scheme. This register assumed a worst-case scenario, before any mitigation measures or emergency plans would be put in place to reduce the likelihood and potential impact of any major accidents and / or disasters.

Risks are rated by multiplying the likelihood rating (likelihood of a risk happening which ranges from extremely unlikely to very likely) with the consequence rating (level of consequences if a major accident or disaster occurred, which ranges from minor to catastrophic). This gives a risk score of low, medium, or high. Low risk scores do not meet the definition of a major accident or disaster and high-risk scores would be considered high risk and unacceptable for the development of the proposed Scheme and would need to be designed out. Medium risk scores would require a level of mitigation that would reduce the level of impact.

For the Construction Phase, there were several risks that were deemed low and were not considered further. No high risks were identified, and the following medium level risks were identified for the Construction Phase:

- Impact on critical infrastructure due to construction works including settlement;
- Major road traffic accident due to increase in traffic and heavy goods vehicles;
- Significant release event or long-term seepage of pollutants into watercourse due to working over or adjacent to watercourses (e.g. Royal Canal and River Tolka); and
- Collapse / Damage to structures;

The proposed Scheme complies with relevant design standards, which include measures to reduce the likelihood of risk events occurring. As such, structures have been designed to avoid the risk of collapse, predicted as 'Medium' risk events. Drainage systems have been designed to cater for increased rainfall events. Also, the proposed Scheme has been designed taking in consideration Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291/2013) (as amended).

Appropriate mitigation measures will be implemented during the Construction Phase. Once these mitigation measures are applied, there are no remaining identified incidents or major accidents or disasters / risk events that present a level of risk that would lead to significant impacts or environmental effects.

For the Operational Phase, there were several risks that were deemed low and were not considered further. No high risks were identified, and the following medium level risks were identified for the Operational Phase:

- Vehicle collisions with pedestrian, cyclists and other road users
- Luas Finglas derailment;
- Fire and/or explosion, either direct or indirect harm;
- Infectious disease; and
- Hydrological event – heavy and prolonged rainfall entering stops and adjacent lands and watercourses.

Significant risks related to infectious disease such as COVID-19 may be accompanied by a significant impact in the proposed Scheme. During the Operational Phase, for those vulnerable risks that cannot be completely designed-out, emergency plans will be available to deal with the response to an emergency in order to minimise the significance of any impacts.

Overall, it can be concluded that the risk of impacts from an infectious disease will be managed to be as low as reasonably practicable. As a result, it is considered that there will not be any likely significant environmental effects arising from the vulnerability of the proposed Scheme to Major Accidents and Natural Disasters.

10.17 Interactions between the Various Environmental Aspects

This section describes inter-relationships among the environmental effects of the proposed Scheme. An interaction of impacts can occur when two or more types of environmental impact associated with a proposed development arise at a particular location or act upon an environmental resource. The overall objective of this assessment is to identify, describe and assess the interaction among all environmental factors. Some of the EIAs within this EIAR already address impact interactions in relevant chapters. Through a review of these issues, interaction assessments will ensure whether additional mitigation is required that would not otherwise have been identified in the individual study areas.

Interactions of EIA study topic areas are typically displayed visually in a matrix table which identifies potential interactions which are likely to occur between the various disciplines.

A summary of the general interactions can be found in Table 10-1. The assessment has taken into account both the Construction and Operational Phases of the proposed Scheme.

Table 10-1: Environmental Interactions Matrix

Inter-Relationship Matrix – Environmental Elements	Human Health		Population		Biodiversity		Water		Lands and Soils		Land Take		Air Quality		Climate		Noise and Vibration		Electromagnetic Compatibility and Interference		Infrastructure and Utilities		Traffic and Transport		Resource and Waste Management		Cultural Heritage		Landscape and Visual Amenity	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Human Health																														
Population	✓	✓																												
Biodiversity																														
Water	✓	✓	✓	✓	✓	✓																								
Lands and Soils	✓				✓		✓																							
Land Take			✓	✓	✓		✓		✓																					
Air Quality	✓	✓	✓	✓	✓	✓			✓																					
Climate	✓	✓	✓	✓				✓	✓				✓	✓																
Noise and Vibration	✓	✓	✓	✓	✓																									
Electromagnetic Compatibility and Interference		✓		✓																										
Infrastructure and Utilities		✓	✓		✓		✓		✓		✓	✓								✓										
Traffic and Transport	✓	✓	✓	✓	✓		✓	✓					✓	✓	✓	✓	✓	✓			✓									
Resource and Waste Management	✓	✓	✓	✓	✓	✓			✓		✓				✓	✓					✓									
Cultural Heritage			✓	✓			✓		✓		✓						✓				✓									
Landscape and Visual Amenity	✓	✓	✓	✓	✓	✓			✓		✓	✓	✓	✓		✓	✓	✓			✓	✓					✓	✓		

Notes: This matrix should be read downwards, starting with each topic identified across the top. ✓ - Indicates Significant interactions between topics. Blank cells indicate no or weak interactions. Con. = Construction Phase. Op. = Operational Phase.

10.18 Cumulative Impacts

Cumulative effects result from the addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects. Additional cumulative impacts can be caused due to incremental changes by other past, present or reasonably foreseeable projects together with the proposed Scheme. Besides existing and / or approved developments as well as developments in the pre-planning process, this EIAR considers development plan land allocations in so far as possible.

Research has been carried out to identify the long list of other developments which may overlap with the proposed Scheme, aiming to determine the cumulative impacts. Desk-based studies undertaken included the study of planning applications, development plan documents, development frameworks, and other available sources. In addition, any approved and still implementable planning applications together with any other major developments that are in pre-planning application and preliminary design phases have been assessed to define the cumulative impacts with the proposed Scheme. The most recent search for developments considered in this EIAR was undertaken on 30th June 2024.

The following sources were considered in identifying other relevant developments for the assessment of cumulative impacts:

- An Bord Pleanála website – for details of Strategic Infrastructure Developments (SIDs) and Strategic Housing Developments (SHDs);
- Local Authority websites and the development plans for Dublin City and Fingal – for details of allocations and areas for regeneration;
- National Planning Application Database – for downloadable list of planning applications sent from Local Authorities;
- Projects being planned by the National Transport Authority (the NTA website, provides detail) as part of other major transport

projects and programmes in accordance with the Transport Strategy for the GDA 2022 – 2042;
- Project Ireland 2040, which combines the National Development Plan and National Planning Framework. (gov.ie – Project Ireland 2040 (http://www.gov.ie) and its interactive map);
- Transport Infrastructure Ireland website – to identify major transport projects and programmes (such as National Roads and Greenways);
- The EIA Portal maintained by the Department of Housing, Planning and Local Government – for applications for development consent accompanied by an EIAR;
- Uisce Éireann's website, which includes a page on its projects (https://www.water.ie/projects/); and
- Iarnród Éireann website, which includes the Dart+ Projects.

A total of 402 'other developments' have been assessed and a total of 43 has been screened in in relation to cumulative impacts relevant to each environmental topic. The assessment of the proposed Scheme's impacts was conducted both cumulatively with all other developments and on a pairwise basis, particularly around 'hubs', where multiple developments are in close proximity to the proposed Scheme's route. For Human Health, Biodiversity, and Land and Soils aspects, all 43 developments were screened out because it was determined that they would not result in any likely significant cumulative impact due to their distance, scale, and nature. The assessment concluded that the mitigation measures already included for the proposed Scheme will be appropriate and sufficient to mitigate cumulative impacts.

The assessment includes a detailed combination of individual project evaluations as well as a hub analysis, which examines projects both individually and as a complete overview. This comprehensive assessment approach ensures that the cumulative impacts of multiple developments and the proposed Scheme are considered in unison. Broombridge, Finglas Village, and Charlestown were chosen as hubs to assess the cumulative

impacts of developments due to their strategic significance and diverse functionalities. The implementation of these measures will avoid or reduce the majority of the identified potential cumulative impacts to an acceptable level with the exception of the following:

- Land Take during the Construction and Operational Phase;
- Traffic and Transport during the Construction Phase;
- Cultural Heritage during the Operational Phase; and
- Landscape and Visual during the Construction Phase.

Standard mitigation measures implemented by other developments and those included in the design are sufficient to reduce cumulative impacts. There are no additional specific mitigation measures required for cumulative impacts.

As both the CEMP and CTMP are dynamic documents, the appointed Contractor will ensure that it remains up-to-date for the duration of the construction period. The CEMP may need to be altered during the lifecycle of the construction period to take account of monitoring results, legislative changes, outcomes of third-party consultations etc. Additional appendices may be added to the CEMP to accommodate monitoring results, permits, etc. However, the finalisation and updating of the CEMP by the appointed Contractor will not affect the robustness and adequacy of the information presented here and relied upon in this EIAR.

Other major transport projects such as BusConnects Dublin and DART+ West will overlap with the proposed Scheme. The mitigation measures required are set out in this EIAR and will be implemented as part of the construction and operation of the proposed Scheme. Coordination and integration between these projects are required to ensure mitigation measures dealing with cumulative impacts are managed properly.

After implementation of mitigation measures any potential negative cumulative impacts will be avoided or reduced, so any residual impacts are considered to be not Significant. Additionally, the

proposed Scheme will have a number of positive residual impacts during its operation in combination with other transport developments. Improvement of public transport services, improvement of air quality, potential for modal shift from private vehicles to public transport and long-term positive effects for businesses due to redevelopment of the area are the potential significant residual cumulative impacts with the proposed Scheme.

SECTION 11: WHAT HAPPENS NEXT?

It is intended that the proposed Scheme will be operational in 2035 (the opening year).

A copy of the draft RO and documentation including the EIAR and the Natura Impact Statement may be inspected free of charge during public opening hours from 22th November 2024 until 20th January 2025 at the following locations:

- The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1, D01 V902;
- The Offices of Dublin City Council, Civic Offices, Wood Quay, Dublin 8, D08 RF3F;
- The Offices of Fingal County Council, County Hall, Main Street, Swords, County Dublin, K67 X8Y2;
- Transport Infrastructure Ireland offices at Parkgate Business Centre, Parkgate Street, Dublin 8, D08 DK10; and
- National Transport Authority offices at Haymarket House, Haymarket, Dublin 7, D07 CF98; (9.15am – 4pm Monday to Friday).

Copies or extracts from the documentation accompanying the application for the RO may be purchased on payment of a fee not exceeding the reasonable cost of making such copy or extract from:

- Transport Infrastructure Ireland, Parkgate Business Centre, Parkgate Street, Dublin 8, D08 DK10, Ireland

Such purchase requests may be sent to Transport Infrastructure Ireland, Parkgate Business Centre, Parkgate Street, Dublin 8, D08 DK10 or info@luasfinglas.ie or by calling Freephone 1800 666 888.

The application may also be viewed / downloaded on / from the following website: www.luasfinglasro.ie from the 15th November 2024.

Submissions or observations may only be made in writing to the Board from 22th November 2024 until 20th January 2025.

Subject to a RO being granted, a public procurement process will be required to select a Contractor(s) to carry out the design and to construct the proposed Scheme. Once the Contractor has been selected, the construction process will begin, and the construction of the proposed Scheme will take approximately 3.5 years.

Figure 11-1: Luas Finglas Roadmap