Contents

1. Introduction

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the Ringsend to City Centre Core Bus Corridor Scheme (referred to as the Proposed Scheme throughout this NTS). The Proposed Scheme will support integrated sustainable transport usage through infrastructure improvements for active travel (both walking and cycling), and the provision of enhanced bus priority measures for existing (both public and private) and all future services who will use the corridor.

The Proposed Scheme has an overall length of approximately 4.3km (2 x 1.6km along the River Liffey Quays and 1.1km of cycle route through Ringsend and Irishtown to Sean Moore Road) and is routed along the north and south quays River Liffey, linking the city centre with the Docklands and an onward cycling connection to Ringsend and Irishtown, all within the County of Dublin and within the Dublin City Council (DCC) administrative area. The Proposed Scheme will involve works on existing streets, the relocation of both pairs of Scherzer Bridges along the north quays and the provision of a new opening bridge across the River Dodder (i.e., the Dodder Public Transport Opening Bridge (DPTOB)) will create a new pedestrian, cycle and public transport connection between Sir John Rogerson's Quay and East Link Road by way of segregated cycling facilities and bus priority infrastructure. A continuation of the two-way cycle route on the south quays will extent through Ringsend and Irishtown towards Sandymount Strand and the Poolbeg peninsula. The route will run via quiet streets at Pembroke Cottages, across Cambridge Road, then through Ringsend Park as a shared path with pedestrian priority, and a cycle track along the northern side of Strand Street and Pembroke Street in Irishtown to the junction of Sean Moore Road and Beach Road. A spur cycle route will be provided towards the Poolbeg Strategic Development Zone (SDZ) lands via Irishtown Stadium and Bremen Road. Shared use symbols will also be installed along York Road and Pigeon House Road to provide a second alternative route towards the Poolbeg SDZ lands. This road has recently been closed to through traffic and is suitable for shared use.

The route of the Proposed Scheme is shown in **Image 1.1.**

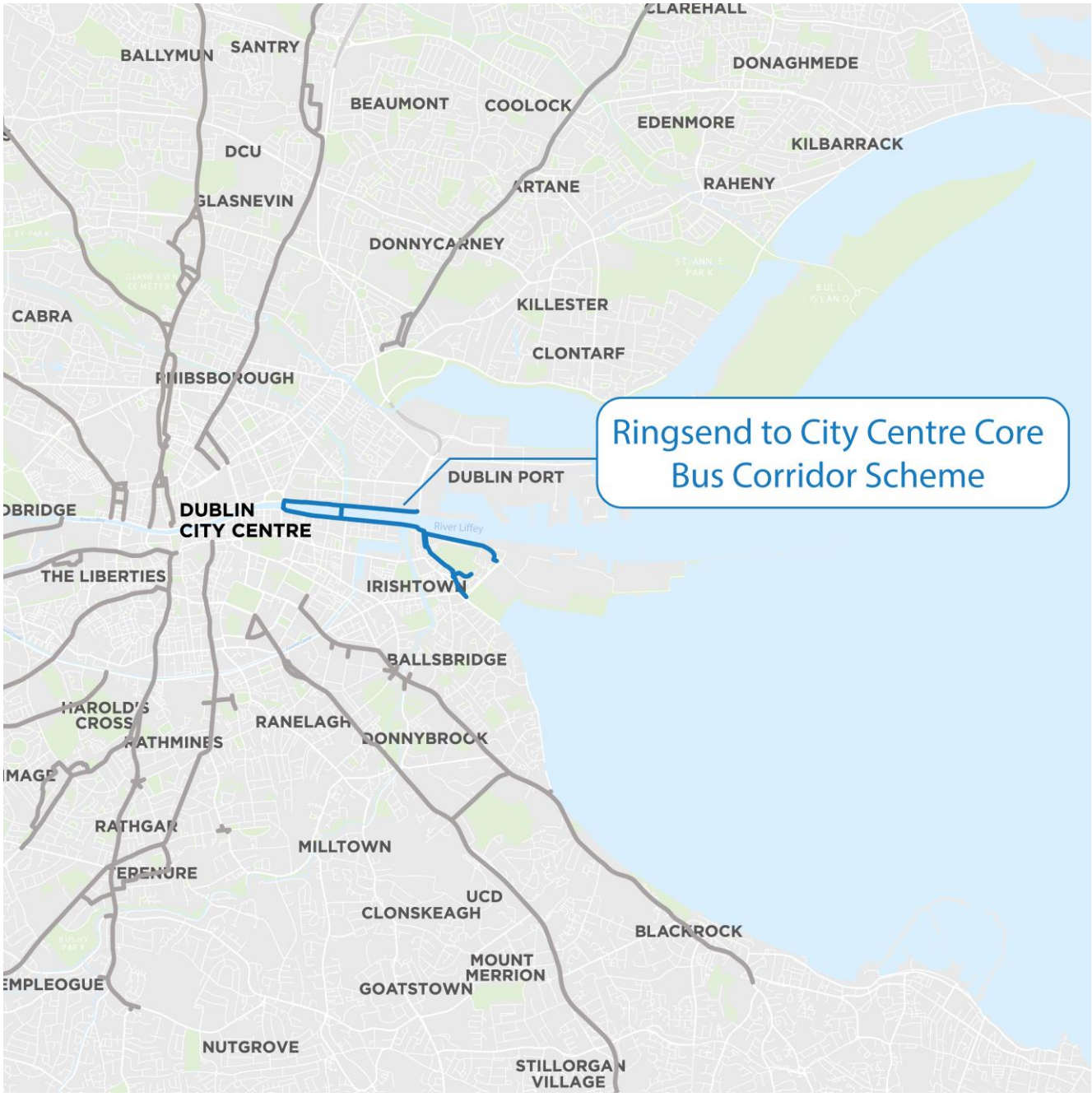

Image 1.1: Route of the Proposed Scheme

The Proposed Scheme will significantly enhance travel by public transport by providing bus priority as well as improved pedestrian and cycling infrastructure. Currently this access corridor is characterised by traffic congestion and discontinuous and inadequate bus and cycling infrastructure, meaning that for most of the journey, buses and cyclists are competing for space with the general traffic, making it less attractive for pedestrians, cyclists, and bus users of these sustainable transport modes.

Through the provision of increased bus priority infrastructure, the Proposed Scheme will improve both the overall journey times for buses along the route and their journey reliability.

In addition to the improvements to bus journey times and journey time reliability, the Proposed Scheme will provide benefits for both cyclists and pedestrians. The scheme design has been developed having regard to the relevant accessibility guidance and universal design principles so as to provide access for all users.

The provision of dedicated cycling infrastructure along the Proposed Scheme will make cycling trips safer and more attractive. In this regard, the Proposed Scheme delivers elements of the National Transport Authority (NTA) Greater Dublin Area Cycle Network, much of which does not currently have adequate provision –while also linking with other existing and proposed cycling schemes and sustainable transport modes, contributing towards the development of a comprehensive cycling network for Dublin.

The Proposed Scheme will provide fully segregated cycle tracks along the entire length of the north and south quays. On the Ringsend cycle route, there will be a mix of shared quiet street, a shared path in Ringsend Park and a segregated cycled track adjacent to Strand Street, Pembroke Street and Beach Road, respectively, in Irishtown.

Several urban realm upgrades, including widened footpaths, high quality hard and soft landscaping and street furniture will be provided in areas of high activity to contribute towards a safer, more attractive environment for pedestrians. The Proposed Scheme includes urban realm upgrades at the Scherzer Bridges at George's Dock and Royal Canal, the DPTOB; as well as on Custom House Quay, and the Excise Walk / North Wall Quay junction where pedestrian boardwalks are proposed. These improvements have taken cognisance of a wider scheme being pursued by Dublin City Council (i.e. the North and South Campshires Public Realm Scheme) which aims to improve the landscape treatment and urban realm of the River Liffey quays campshires more widely.

The primary objective of the Proposed Scheme, therefore, is the facilitation of modal shift from car dependency through the provision of walking, cycle, and bus infrastructure enhancements thereby contributing to an efficient, integrated transport system and facilitating a shift to a low carbon and climate resilient city.

The Proposed Scheme is one of 12 schemes to be delivered under the BusConnects Dublin - Core Bus Corridors Infrastructure Works (hereafter referred to as the CBC Infrastructure Works). The CBC Infrastructure Works is one of the initiatives within the NTA's overall BusConnects Programme. The BusConnects Programme seeks to greatly improve bus services in Irish cities, including Dublin, so that journeys by bus will be fast, reliable, punctual, convenient, and affordable. The proposed CBC Infrastructure Works are illustrated in **Image 1.2.**

Image 1.2: CBC Infrastructure Works

It is envisaged that the CBC Infrastructure Works, once completed, will deliver the radial Core Bus Corridors identified in the NTA's Transport Strategy for the Greater Dublin Area 2022.

1.1 Aims and Objectives

The aim of the Proposed Scheme is to provide improved walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the Proposed Scheme are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements;

- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;
- Enable compact growth, regeneration opportunities and more effective use of land in Dublin, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

The planning and design of the Proposed Scheme has been guided by these aims and objectives.

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 walking and cycling and a mode shift to public transport resulting in better air quality; and
- To support increased economic and social potential through integrated land-use and transport planning to reduce the time burden of travel.

1.2 Role of the National Transport Authority (NTA)

The NTA is a statutory non-commercial body, which operates under the guidance of the Department of Transport. The NTA was established on foot of Number 15 of 2008 - Dublin Transport Authority Act 2008 (as amended) (hereafter referred to as the '2008 Act').

In the case of the Proposed Scheme, the functions of the NTA include undertaking the design and planning process, seeking (and obtaining) all development consents including related compulsory acquisition approvals from An Board Pleanála, and constructing the Proposed Scheme (if approved).

2. Environmental Impacts Assessment Process

2.1 EIA Process

Environmental Impact Assessment (EIA) is a systematic and an iterative process that examines the potential environmental impacts of a proposed scheme and establishes appropriate design and mitigation measures to avoid, reduce or offset impacts.

The EIAR reports the findings of an assessment of the environmental impacts of the Proposed Scheme. The purpose of the EIAR is to:

- Describe the baseline conditions before any work on the Proposed Scheme has commenced;
- Describe the Proposed Scheme;
- Describe the assessment methodologies used to assess the predicted environmental impacts of the Proposed Scheme;
- Describe environmental issues and any likely significant effects which may arise during the Construction and Operational Phases of the Proposed Scheme;
- Consider the potential cumulative impacts as a result of potential impacts from other schemes in combination with the predicted impacts of the Proposed Scheme;
- Propose mitigation measures to reduce or avoid these effects; and
- Identify the significant residual impacts which occur after the proposed mitigation measures have been implemented.

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.

This NTS is Volume 1 of the EIAR and presents a summary of the EIAR, including key aspects of the Proposed Scheme and the associated beneficial and adverse impacts of importance.

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

- Volume 1 – NTS (this document);
- Volume 2 - Main Report;
- Volume 3 – Figures; and
- Volume 4 – Appendices.

3. Need for the Proposed Scheme

3.1 Context

Private car dependence causes significant congestion, affecting our quality of life, our urban environment, and road safety. As the population of the Greater Dublin Area 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. On the other hand, 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.

3.2 Project Ireland 2040 - National Development Plan 2021-2030

Under the heading 'Major National Infrastructure Projects' the National Development Plan 2021-2030 sets out a selection of 'Sustainable Mobility' projects included in the Plan as 'Strategic Investment Priorities'. The Proposed Scheme, forming part of the Core Bus Corridors Infrastructure Works within the overall BusConnects Programme 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 us move from excessive dependence on private car to walking, cycling and public transport.

3.3 Climate Action Plan 2023

The Climate Action Plan 2023 is the second annual update to Ireland's Climate Action Plan 2019. The Climate Action Plan 2023 is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The Climate Action Plan 2023 implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve Ireland's emissions by 2023 and reach net zero no later than 2050.

The Climate Action Plan 2023 calls for a significant cut in transport emissions by 2030 in order to meet the sectoral emissions ceiling, with the transport sector having an aim of a 50% reduction in emissions by 2030. The 'Avoid' (reduce or avoid the need for travel – land use planning), 'Shift' (shift to more environmentally friendly modes – public transport, active travel), 'Improve' (improve the energy efficiency of vehicle technology – vehicle efficiency, clean fuels) approach has been adopted to help achieve these targets. The targets from the previous plan (Climate Action Plan 2021) have been updated to include *'a 20% reduction in total vehicle kilometres, a reduction in fuel usage, and significant increases to sustainable transport trips and modal share'*.

One of the key actions to deliver abatement in transport identified in the Climate Action Plan 2023 is the advancement of the BusConnects Programme in five cities (which includes Dublin).

The delivery of the Proposed Scheme will provide the transport infrastructure required to deliver sustainable transport options that will support the key actions set out in the Climate Action Plan 2023. The Proposed Scheme will expand, enhance and connect to pedestrian and cycle networks and will assist in facilitating modal shift. It is clear that the targets set out within the Climate Action Plan 2023 are closely linked to the delivery of key transport

3.4 Greater Dublin Area Transport Strategy

The Greater Dublin Area Transport Strategy 2022 – 2042 has replaced the previous transport strategy (for the period 2016 to 2035). 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 requirement, serves the needs of urban and rural communities, and supports the regional economy'.*

A key focus of the strategy is to enable increased use of other transport modes to meet environmental, economic and social objectives related to emissions, congestion and car dependency. It sets a clear direction towards a 50% reduction in CO_2 (carbon dioxide) emissions within the Greater Dublin Area by 2030.

Similar to the approach adopted under the Climate Action Plan 2023, the Greater Dublin Area Transport Strategy 2022-2042 references the 'Avoid', 'Shift', and 'Improve' concept / principles in integrated land use and transport planning and the measures within the Greater Dublin Area Transport 2022-2042 have been categorised under these three headings / themes.

The Greater Dublin Area Transport Strategy 2022-2042 considers the rod user hierarchy to encourage the use of sustainable transport, with pedestrians and cyclists placed at the top of the hierarchy. Due to the larger number of users that can use public transport, it needs to be prioritised over the private car in the design of the transport networks. The GDA Transport Strategy 2022-2042 puts the delivery of BusConnects – Dublin, of which the Proposed Scheme is a part, at the heart of its objectives. There is added emphasis on the delivery of public transport, active travel and enhanced accessibility to sustainable modes of transport, all of which the Proposed Scheme will help to deliver.

The Proposed Scheme supports the implementation of the Greater Dublin Area Transport Strategy 2022 - 2042 in regard to improving the active travel environment along the Proposed Scheme, while taking cognisance of and supporting pedestrian and public realm planning objectives locally. In addition, the Proposed Scheme will improve the existing streetscape/urban realm setting along the corridor. This will include the provision of significantly enhanced crossing facilities, and the introduction of new and improved landscaping provisions along the corridor, and complimentary planting regime and streetscape improvements at key locations will also enhance the character of the surrounding built environment along the corridor.

To inform the preparation of the previous Transport Strategy for the Greater Dublin Area 2016 – 2035, the NTA prepared the Core Bus Network Report 2015 for the Dublin Metropolitan Area, which identified those routes on which there needed to be a focus on high capacity, high frequency and reliable bus services, and where investment in bus infrastructure should be prioritised and concentrated. There are three main bus corridors in the south-central Dublin area with varying degrees of bus priority linking outer suburbs to the City Centre. These are the Rathfarnham-Terenure-Rathgar-Rathmines on the eastern side, the Kimmage corridor (the Proposed Scheme) in the middle, and the Tallaght-Greenhills-Walkinstown-Crumlin corridor on the western side.

The Core Bus Network study included a recommended route from Kimmage to the City Centre on the basis of the need to serve significant demand along this entire corridor, and the need to address service deficiencies (lack of bus priority and associated journey time reliability) for a high level of scheduled bus services already operating along this corridor.

The Greater Dublin Area Transport Strategy 2022 - 2042 states that subject to obtaining statutory planning approvals, the NTA will proceed to implement the 12 Core Bus Corridors as set out in the BusConnects Programme (which includes the Proposed Scheme). They will facilitate faster and more reliable bus journeys on the busiest bus corridors in the Dublin region, making the overall bus system more convenient and useful for more people. This in turn will support the potential to increase the bus network capacity of services operating along the corridor and thereby further increasing the attractiveness of public transport.

In addition, the Greater Dublin Area Transport Strategy 2022 - 2042 states that key elements of the Cycle Network Plan for the Greater Dublin Area will be delivered as part of the Core Bus Corridor schemes. The Proposed Scheme supports the implementation of the Cycle Network Plan as it will provide infrastructure that will support and enhance cycling as a transport mode, including the delivery of infrastructure for specific routes identified as part of the Cycle Network Plan. The segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Scheme will further maximise the movement of people travelling sustainably along the corridor and will therefore cater for higher levels of future population and employment growth.

In the absence of the Proposed Scheme bus services will be operating in a more congested environment, leading to higher journey times for bus and lower reliability which will lead to reduced levels of public transport use, making the bus system far less attractive and less resilient to higher levels of growth. The absence of walking and cycling measures, as provided for in the Proposed Scheme, will significantly limit the potential to grow those modes into the future. Overall, the Proposed Scheme will make a significant contribution to the overall aims and objectives

of BusConnects, the Greater Dublin Area Strategy 2022-2042 and will allow the city to grow sustainably into the future, which would not be possible in the absence of the Proposed Scheme.

4. Consultation

Public participation has been an integral part of the development of the Proposed Scheme from the outset. Non-statutory consultation was carried out, in three phases (one in relation to the Emerging Preferred Route and two in relation to the Preferred Route Option), to inform the public and stakeholders of the development of the Proposed Scheme from an early stage and to seek feedback and participation throughout its development.

The primary objective of the non-statutory public consultation process was to provide opportunities for members of the public and interested stakeholders to contribute to the planning and design of the Proposed Scheme and to inform the development process. Public participation in the planning and design of the Proposed Scheme was encouraged from an early stage through on-the-ground engagement and information and media campaigns.

The non-statutory consultation process assisted in:

- The establishment of a sufficiently robust environmental baseline for the Proposed Scheme and its surroundings;
- The identification, early in the process, of specific concerns and issues relating to the Proposed Scheme so that they could be appropriately accounted for in the design and assessment scope; and
- Ensuring the appropriate involvement of the public and stakeholders in the design and assessment process.

These consultations are briefly described below.

4.1 Emerging Preferred Route Option Consultation

The first phase of public consultation carried out was based on the Emerging Preferred Route and this ran from the 26 February 2019 to 31 May 2019.

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, elected representatives and stakeholders where appropriate. These amendments were incorporated into the design and informed the Preferred Route Option design-development which was subsequently also published for non-statutory public consultation.

At the initiation of the public consultation process, a Community Forum was established with the aim of facilitating communication between community representatives, elected representatives and the BusConnects Infrastructure team. Community Forum meetings took place, where the attendees were provided with an update on the design for the Proposed Scheme and given the opportunity to ask questions of the project team and provide feedback.

4.2 Preferred Route Option Consultations

The Preferred Route Option non-statutory public consultation took place from 4 March 2020 to 17 April 2020. The public were invited to make written submissions in relation to the published proposals to the BusConnects Infrastructure team either through an online form, by email or by post. Due to the COVID-19 pandemic all planned in-person events scheduled after 12 March 2020 were cancelled. In deference to the submissions which had already been received, the decision was made not to cancel this non-statutory consultation phase.

The NTA held a third round of public consultation prior to finalising the Preferred Route Option in November 2020 and this took place from 4 November 2020 to 16 December 2020. This third round was carried out using virtual consultation rooms, offering a ‘call-back’ facility along with descriptions, supporting documentation and mapping of the draft Preferred Route Option as well as information on all revisions, if any, made since the second round of non-statutory public consultation in March 2020.

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

4.3 Consultation with Prescribed Bodies and Other Consultees

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

During the development of the EIAR, prescribed bodies (including the Department of Communications, Climate Action and the Environment, the Department of Transport, Dublin City Council, the Heritage Council, Inland Fisheries Ireland, and the Office of Public Works) and relevant non-statutory consultees were provided with a report 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.

4.4 Consultation with Landowners

There has been ongoing engagement with landowners whose properties will be impacted or potentially affected, as the design development for the Proposed Scheme has progressed, from the earliest stages of the project in 2019 through to the Autumn of 2021. This engagement has overlapped with the public consultations (in May 2019, March 2020, and November 2020). A letter drop was also carried out in Summer 2020 to request access to properties to undertake more detailed surveys. Additional letters were sent to affected landowners in May 2021 offering further engagement. Over the course of these engagements, affected property owners have had the opportunity to discuss different aspects of the Proposed Scheme with the design team. Follow-up conversations have been facilitated as a result of these letters on request. In addition, a further attempt was made to contact those occupiers that had yet to make contact by visiting each property during September 2021. Where no one answered the door, a letter was placed through the letterbox again requesting the occupiers to contact the NTA. Since September 2021, further engagements have taken place with affected property owners to track changes of ownership, and in response to enquiries, with some site meetings arranged where necessary. In February 2023, all known affected owners and occupiers of properties affected by the Proposed Scheme were contacted by letter to refresh the information in preparation for the Proposed Scheme planning application.

4.5 Consultation with Local Residents and Business Groups

Throughout the design development of the Proposed Scheme from the initiation of the first non-statutory public consultation in November 2019, the NTA facilitated consultation on request with local resident groups and with business interests on/adjacent to the route. Similar to the Community Forum meetings such events facilitated discussion on the design for the Proposed Scheme and attendees were given the opportunity to ask questions of the BusConnects Infrastructure team and provide feedback.

5. Alternatives Considered

5.1 Strategic Alternatives

The Proposed Scheme has been developed following careful consideration of alternatives. The Transport Strategy for the Greater Dublin Area 2016 - 2035, and its associated Strategic Environmental Assessment, considered several strategic options relevant to the Proposed Scheme. The Greater Dublin Area Transport Strategy 2022-2042 replaces the prior transport strategy for the period between 2016 and 2035.

The consideration of alternative options included a 'Do Nothing' Scenario. This is a scenario where the Proposed Scheme would not be progressed. This option was deemed to be unacceptable as traffic congestion throughout the Greater Dublin Area is particularly high, with the number of cars on the road increasing and significant daily traffic delays. Without intervention, potential impacts could worsen for the region, including:

- Continued growth of traffic congestion;
- Impacts on the ability of the region to grow economically due to increased traffic congestion;
- Longer journey times and increased travel stress will diminish quality of life; and
- Environmental emissions targets will not be met.

The NTA carried out a review of the existing transport network and future forecasts of travel demand in Dublin. This review was further broken down into an assessment of existing and future land use and travel patterns and identified trends and issues within eight transport corridors. Based on these assessments, the most practical set of transport service proposals was set out for each of the eight corridors, combining to form the overall integrated transport system for the Greater Dublin Area up to 2035 in the Greater Dublin Area Transport Strategy 2016 – 2035.

Through the work undertaken in the preparation of the Transport Strategy for the Greater Dublin Area 2016 - 2035, including its supporting studies, various alternatives to deal with the transport needs which are intended to be addressed by the Proposed Scheme were identified and considered.

Other strategic alternatives considered included:

- Bus Rapid Transit;
- Light Rail;
- Metro;
- Heavy Rail;
- Demand Management; and
- Technological Alternatives.

The Proposed Scheme has been developed to provide a level of service similar to Bus Rapid Transit. The Transport Strategy for the Greater Dublin Area 2016 - 2035 has concluded that new heavy rail and light rail / metro alternatives would not be justified by the predicted level of demand. However, the existing DART line will be upgraded and extended as part of the GDA Transport Strategy. The challenges outlined in the Transport Strategy for the Greater Dublin Area 2016-2035 and identified need for BusConnects Dublin as determined in the preparation of that prior strategy, and the evidence from the detailed corridor studies undertaken in the preparation of the prior strategy is still valid and robust.

Demand management and technological alternatives, such as congestion charges, road pricing, electric vehicles on their own would not remove the need for additional bus transport or cycling infrastructure along the route of the Proposed Scheme.

5.2 Route Alternatives

Alternative options have been considered in a number of areas during the design development of the Proposed Scheme. The development of the design has also been informed by a review of feedback and new information received during each stage of public consultation and as the level of data, such as surveys, transport and environmental data was collected and assessed.

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

1) A **Feasibility and Options Report** was concluded in 2018, setting out the initial route options and concluding with the identification of an Emerging Preferred Route;
2) A first round of non-statutory **Public Consultation** was undertaken on the Emerging Preferred Route from 26 February 2019 to 31 May 2019;
3) Development of **Draft Preferred Route Option** (April 2019 to March 2020). Informed by feedback from the first round of public consultation, stakeholder engagement and the availability of additional design information, the design of the Emerging Preferred Route evolved with further alternatives considered;
4) A second round of non-statutory **Public Consultation** was undertaken on the Draft Preferred Route Option from 4 March 2020 to 17 April 2020. Due to the introduction of COVID-19 restrictions, some planned in-person information events were cancelled, leading to a decision to hold a third consultation later in the year;
5) Further development of an updated **Draft Preferred Route Option** was undertaken subsequent to the second round of public consultation, which took account of submissions received, continuing stakeholder engagement and additional design information;
6) A third round of non-statutory **Public Consultation** was undertaken on the updated Draft Preferred Route Option from 04 November 2020 to 16 December 2020; and
7) Finalisation of **Preferred Route Option**. Informed by feedback from the overall public consultation process, continuing stakeholder engagement and the availability of additional design information, the Preferred Route Option, being the Proposed Scheme, was finalised.

The feasible route alternatives considered covered a wide network of roads between the city centre and Ringsend. These were narrowed down using a high-level qualitative assessment 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:

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

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

Informed by the appraisal of alternative route options, the Emerging Preferred Route was identified. That Emerging Preferred Route is summarised as follows:

> '*The Ringsend to City Centre Core Bus Corridor (CBC) commences at Talbot Memorial Bridge. The scheme encompasses bus lane and cycle infrastructure on both north and south quays linking the city centre with the Docklands and onto Ringsend and Irishtown. The scheme will involve works on existing streets and new road links.*'

5.3 Design Alternatives

Following the completion of the public consultation process in relation to the Emerging Preferred Route, various amendments were made to the scheme proposals to address some of the issues raised during the consultations, including incorporating suggestions and recommendations from local residents, community groups and stakeholders, and / or arising from the availability of additional information. Alternative arrangements for the Scherzer Bridges at George's Dock and at the Royal Canal were also considered as part of the development of the Preferred Route Option. The preferred option was determined to be their careful deconstruction and reconstruction / relocation to positions either side of the road carriageway at their current locations. These amendments were incorporated into the designs and informed a draft Preferred Route Option.

The EPR Option proposed to commence the Proposed Scheme at Talbot Memorial Bridge and was routed via the north and south quays to the Tom Clarke East Link Bridge. The Proposed Scheme was then routed to Sean Moore Road via two separate branches. One branch along York Road and Pigeon House Road and another along Pembroke Cottages, Cambridge Park, Ringsend Park, Strand Street and Beach Road. This second branch also inherited a sub-route to Sean Moore Road by skirting along next to Irishtown Stadium and Bremen Road.

Several changes to the design were made based on feedback received during the second and third rounds of public consultation and dialogue with stakeholders. However, the changes made to the Draft PRO were relatively small scale.

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

6. Description of the Proposed Scheme

The Proposed Scheme has an overall length of approximately 4.3km (2 x 1.6km along the River Liffey Quays and 1.1km of cycle route through Ringsend and Irishtown to Sean Moore Road), and is routed along the north and south quays of the River Liffey, linking the city centre with the Docklands and an onward cycling connection to Ringsend and Irishtown, all within the County of Dublin and within the Dublin City Council (DCC) administrative area. The Proposed Scheme includes priority for buses along the entire length of the north quays from Talbot Memorial Bridge to the 3Arena at the Tom Clarke East Link Bridge, consisting of dedicated bus lanes in both directions, which will require the relocation of both pairs of Scherzer Bridges along the north quays. Bus priority will also be achieved on the south quays through the provision a new opening bridge across the River Dodder (via the Dodder Public Transport Opening Bridge (DPTOB)) as well as the provision of intermittent sections of bus lane to ensure bus priority on the approach to all major junctions. Full bus lane provision on the south quays is not considered necessary in the context of the layout of the traffic cells and existing one-way restrictions, which prevent congestion developing. Eastbound buses will use the north quays only between the Customs House and the Samuel Becket Bridge, with eastbound buses proceeding on both quays from this point to the Tom Clarke East Link Bridge. Westbound buses will use the full length of both quays.

Segregated two-way cycle tracks will be provided along the quaysides (campshires) on both sides of the River Liffey. A continuation of the two-way cycle route on the south quays will extent through Ringsend and Irishtown towards Sandymount Strand and the Poolbeg peninsula. The route will run via quiet streets at Pembroke Cottages, across Cambridge Road, then through Ringsend Park as a shared path with pedestrian priority, and a cycle track along the northern side of Strand Street and Pembroke Street in Irishtown to the junction of Sean Moore Road and Beach Road. A spur cycle route will be provided towards the Poolbeg Strategic Development Zone (SDZ) lands via Irishtown Stadium and Bremen Road. Shared use symbols will also be installed along York Road and Pigeon House Road to provide a second alternative route towards the Poolbeg SDZ lands. This road has recently been closed to through traffic and is suitable for shared use.

Pedestrian facilities will be upgraded, and additional controlled and uncontrolled crossings will be provided at side roads, road crossings, and at junctions. In addition, urban realm works will be undertaken at key locations with higher quality materials, planting and street furniture provided to enhance the pedestrian experience. Examples of such works can be seen at the pair of Scherzer Bridges at Custom House Quay and North Wall Quay as well as the junction of North Wall Quay and Excise Walk. Pedestrian Boardwalks are proposed at Excise Walk and also at the former DCC Dublin Docklands offices at Custom House Quay to enhance the pedestrian environment (the latter to be provided on completion of the redevelopment of the offices).

The Proposed Scheme includes a local modification to Mayor Street at Spencer Dock. In order to accommodate proposed turning movement restrictions at the Guild Street / Samuel Beckett Bridge junction for the purposes of provided enhanced bus, cycle, and pedestrian priority, it is proposed to open an eastbound traffic lane north of the Luas between the National Convention Centre Car Park and Park Lane. This will facilitate traffic exiting the car park towards the M50 Port Tunnel.

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, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development process has been incorporated where appropriate.

The Proposed Scheme has been developed to ensure that the principles of universal design are integrated fully in the design, providing access for all users, and eliminating barriers to disabled people.

A typical BusConnects road layout is shown in **Image 6.1.**

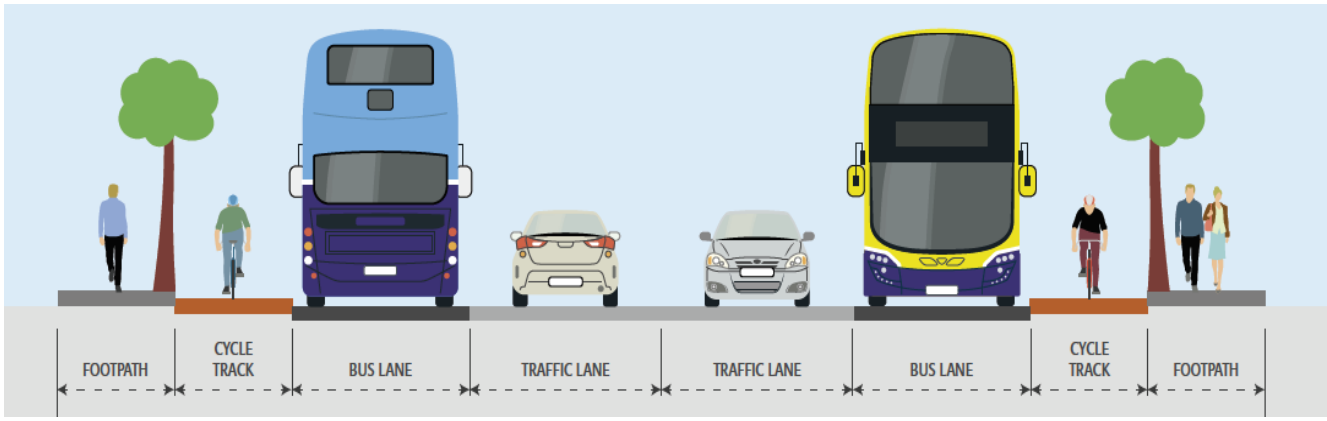

Image 6.1: Typical BusConnects Road Layout

The Proposed Scheme will make significant improvements to pedestrian and cycling facilities and to bus priority. Some of the key changes that will be made to the existing corridor as a result of the Proposed Scheme are the following:

- The number of pedestrian signal crossings will increase by 100% from 2 to 4 as a result of the Proposed Scheme;
- The proportion of segregated cycle facilities will increase from 58% on the existing corridor to 100% on the Proposed Scheme;
- The proportion of the route having bus priority measures will increase from 38% on the existing corridor to 89% on the Proposed Scheme.

The Proposed Scheme is described in the following geographical sections:

- Section 1: Talbot Memorial Bridge to Tom Clarke East Link Bridge;
- Section 2: Dodder Public Transport Opening Bridge (DPTOB); and
- Section 3: Tom Clarke East Link Bridge to Sean Moore Road.

6.1 Section 1 – Talbot Memorial Bridge to Tom Clarke East Link Bridge

This Section of the Proposed Scheme will commence at the Talbot Memorial Bridge and will proceed eastwards along the north and south quays and will conclude on either side of the Tom Clarke East Link Bridge.

Multiple structures are proposed along this Section to accommodate the Proposed Scheme. The historic Scherzer Bridges at George's Dock and the Royal Canal will be relocated to either side of the carriageway to facilitate the addition of bus lanes, while two boardwalk structures along the R801 on Custom House Quay and North Wall Quay will be constructed to assist with facilitating pedestrian movement. On the south quays, the DPTOB will be constructed across the mouth of the River Dodder, at its confluence with the River Liffey, to connect Sir John Rogerson's Quay to East Link Road and York Road.

At the northern end of Samuel Beckett Bridge at the junction of R801 North Wall Quay with Guild Street, some eastbound buses may wish to turn right onto the bridge. These buses will be detected on their approach and the bus lane signal will be released in advance of general traffic by a dedicated bus lane signal. This will enable some bus services to turn right from the bus lane on the left side of the traffic lane. These buses will not need to weave right across general traffic to reach the right-turn lane. General traffic in both directions will move in a separate signal stage after the bus stage has finished.

Similar right-turn advance bus lane signals will operate in the eastbound direction at the junctions of Commons Street and Park Lane on R801 North Wall Quay.

Temporary land acquisition is required for Construction Compounds at both sets of Scherzer Bridges as well as along part of Sir John Rogerson's Quay to facilitate works. These lands will be reinstated in line with existing conditions and / or urban realm improvements (as applicable) following the completion of works.

6.2 Section 2 – River Dodder Public Transport Bridge (DPTOB)

This Section of the Proposed Scheme consists of a new public transportation opening bridge (DPTOB) over the River Dodder at its confluence with the River Liffey.

The proposed DPTOB will include:

- The construction of approach roads associated with the bridge;
- A new control building for operating the bridge;
- A new club house and facilities for St. Patrick's Rowing Club (SPRC) which will be required to be moved as a result of the Proposed Scheme;
- The provision of a new ESB substation;
- The reclamation of land to the west of Tom Clarke East Link Bridge to facilitate construction works; and
- Landscaping of the area between York Road / Thorncastle Street and the R131 Regional Road over the extent of this Section of the Proposed Scheme.

6.3 Section 3 – Tom Clarke East Link bridge to Sean Moore Road

This Section of the Proposed Scheme will commence from the southern end of the Tom Clarke East Link Bridge at the junction with the proposed DPTOB and will proceed to the junction of R131 Sean Moore Road and R802 Beach Road.

No new or upgraded bus facilities will be provided in this section of the Proposed Scheme as it is intended that buses will use the existing facilities along the East Link Road to R131 Sean Moore Road. The provision of new and upgraded cycling facilities are the main works in this section of the Proposed Scheme.

This section of the Proposed Scheme will comprise the following works along several cycle routes:

- From the southern end of the Tom Clarke East Link Bridge at the junction of the proposed DPTOB, a two way cycle track will extend for 100m to York Road;
- From York Road the cycle route will follow quiet local streets at Pembroke Cottages and Cambridge Park to Ringsend Park, where the existing footpath along the western boundary of the park will be improved to a 4m wide shared path with pedestrian priority;
- From the southern end of Ringsend Park, a segregated cycle track will be provided along Strand Street, Pembroke Street, and R802 Beach Road to R131 Sean Moore Road;
- A branch cycle route from the southern end of Ringsend Park will skirt around Irishtown Stadium to provide a direct connection to the Poolbeg SDZ lands via Bremen Road; and
- A branch cycle route will share the quiet residential streets along York Road and Pigeon House Road to Poolbeg, where Quiet Street Treatment will be provided (in addition to the existing traffic calming measures that are already provided).

7. Construction

The Construction Phase for the Proposed Scheme will take approximately 30 months to complete, assuming that the construction of the DPTOB and the other elements of the Proposed Scheme are constructed concurrently. It should be noted however that it is envisaged that the DPTOB will be constructed under a separate Construction Contract from the reminder of the Proposed Scheme, therefore it is possible that the construction of the DPTOB could be undertaken in a different sequence (e.g., either independently of the other elements or overlapping with them). The Proposed Scheme will be constructed in sections, with each individual section being constructed in a short duration, typically ranging between 9 to 30 months.

The construction of the Proposed Scheme will include the following activities:

- Site preparation and clearance works, including:
  - Land acquisition where temporary or permanent land take is required;
  - Installation of fencing and signage;
  - Protection of trees and vegetation to be retained;
  - Vegetation clearance and treatment of non-native invasive plant species;
  - Archaeological investigations;
  - Ground investigations;
  - Set up of Construction Compounds;
  - Installation of temporary lighting; and
  - Demolition of items such as walls, gates, fencing, lighting poles and bus stops.
- Road and street upgrades, including:
  - Excavation of the road surface;
  - Disruption / alterations to parking / loading provisions and access to premises;
  - Implementation of pedestrian and cyclist safety measures;
  - Temporary alterations to public transport services;
  - Implementation of any road closures or diversions;
  - Adjustment or upgrades to drainage;
  - Realignment, upgrades, replacement or protection of utilities and services;
  - Construction of pavement, including general traffic carriageways, bus lanes, on-road cycle tracks, off-road cycle tracks, off-line bus stops, bus terminals, traffic islands, off-line parking and loading bays;
  - Upgrades to Traffic Signal Junctions;
  - Upgrades of road furnishings (including street furniture, signage, lighting, bus stops (shelters, CCTV, and information displays) and communication systems); and
  - Boundary treatment and landscaping.
- Structural Works including:
  - Deconstruction and relocation of George's Dock Scherzer Bridges and construction of replacement carriageway bridge;
  - Construction of pedestrian boardwalk at the (former) DCC Docklands Offices;
  - Construction of pedestrian boardwalk at North Wall Quay;
  - Deconstruction and relocation of Royal Canal Scherzer Bridges and construction of replacement carriageway bridge; and
  - Construction of Dodder Public Transport Opening Bridge (DPTOB); and
  - Demolition of existing SPRC facilities and construction of replacement / relocated facilities.
- Construction site decommissioning, including the removal of all construction facilities and equipment.

Construction Compounds for the Proposed Scheme will be located at land adjacent to the Proposed Scheme at a number of locations. The Construction Compounds will be located at the following sites:

- **Construction Compound R1:** George's Dock Scherzer Bridges along Custom House Quay;
- **Construction Compound R2:** Royal Canal Scherzer Bridges along North Wall Quay;
- **Construction Compound R3a/R3b:** West of the DPTOB along Sir John Rogerson's Quay; and
- **Construction Compound R4:** East of the DPTOB at Thorncastle Street / York Road.

Construction Compound R1 will be located along Custom House Quay, at George's Dock, north of the existing Scherzer Bridges, either side of the George's Dock culvert, and across the culvert. During construction, the existing Scherzer Bridges will be removed, a new bridge constructed in their place, and the Scherzer Bridges brought back and reintroduced either side of the new bridge. There will be two layouts required for Construction Compound R1, before and after the removal of the Scherzer Bridges, as shown in **Image 7.1** and **Image 7.2** respectively. The area of Construction Compound R1 before and after the relocation of the Scherzer Bridges will be approximately 860m^2 and 770m^2.

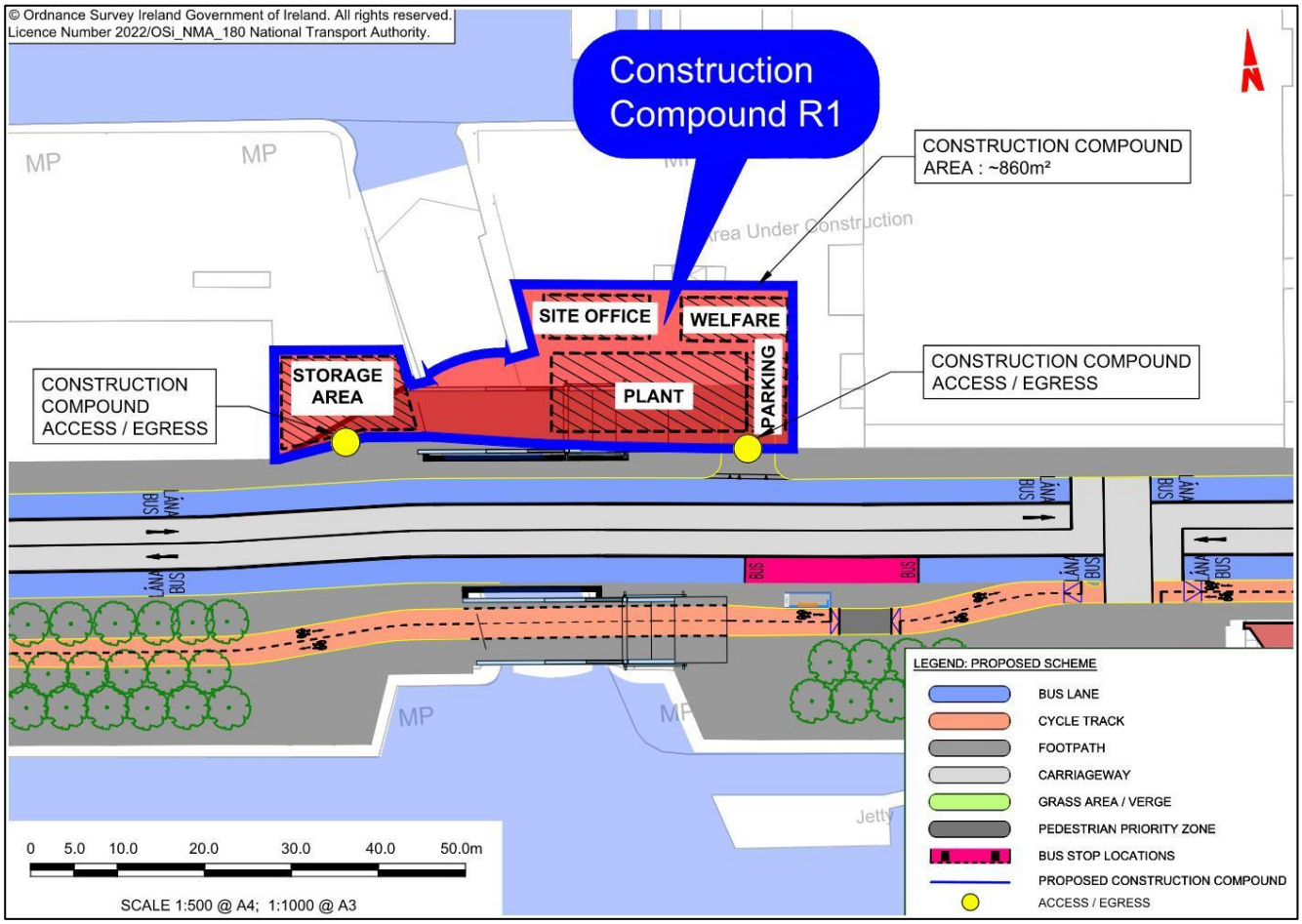

Image 7.1: Location and Extent of Construction Compound R1

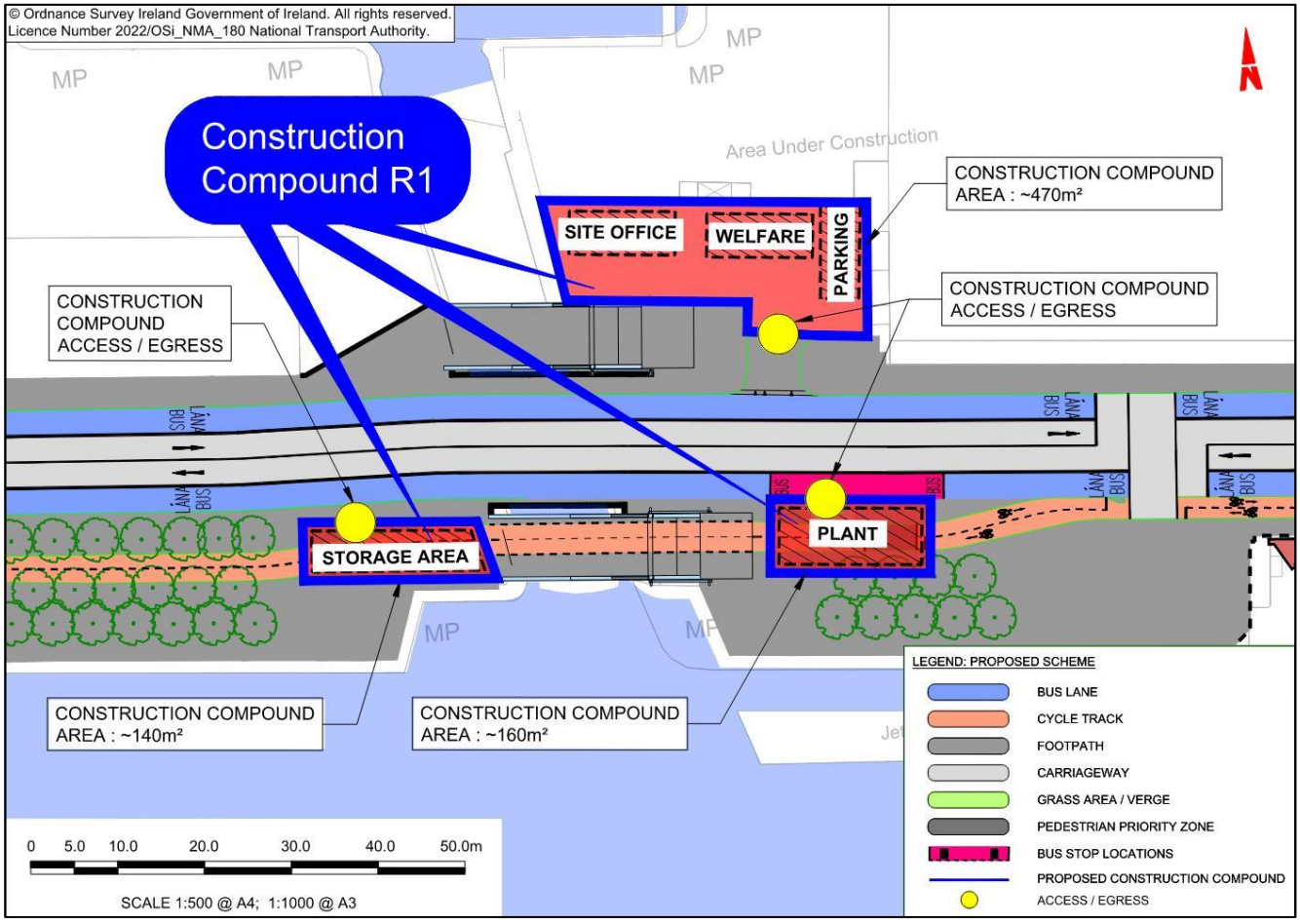

Image 7.2: Location and Extent of Construction Compound R1 After Relocation of Scherzer Bridges at George's Dock

Construction Compound R2 will be located along North Wall Quay, at Spencer Dock, north of the existing Scherzer Bridges, either side of the Royal Canal. During construction, the existing Scherzer Bridges will be removed, a new bridge constructed in their place, and the Scherzer Bridges brought back and reintroduced either side of the new bridge). There will be two layouts required for Construction Compound R2, before and after the removal of the Scherzer Bridges, as shown in **Image 7.3** and **Image 7.4** respectively. The area of Construction Compound R2 before and after the relocation of the Scherzer Bridges will be approximately 400m^2 and 360m^2.

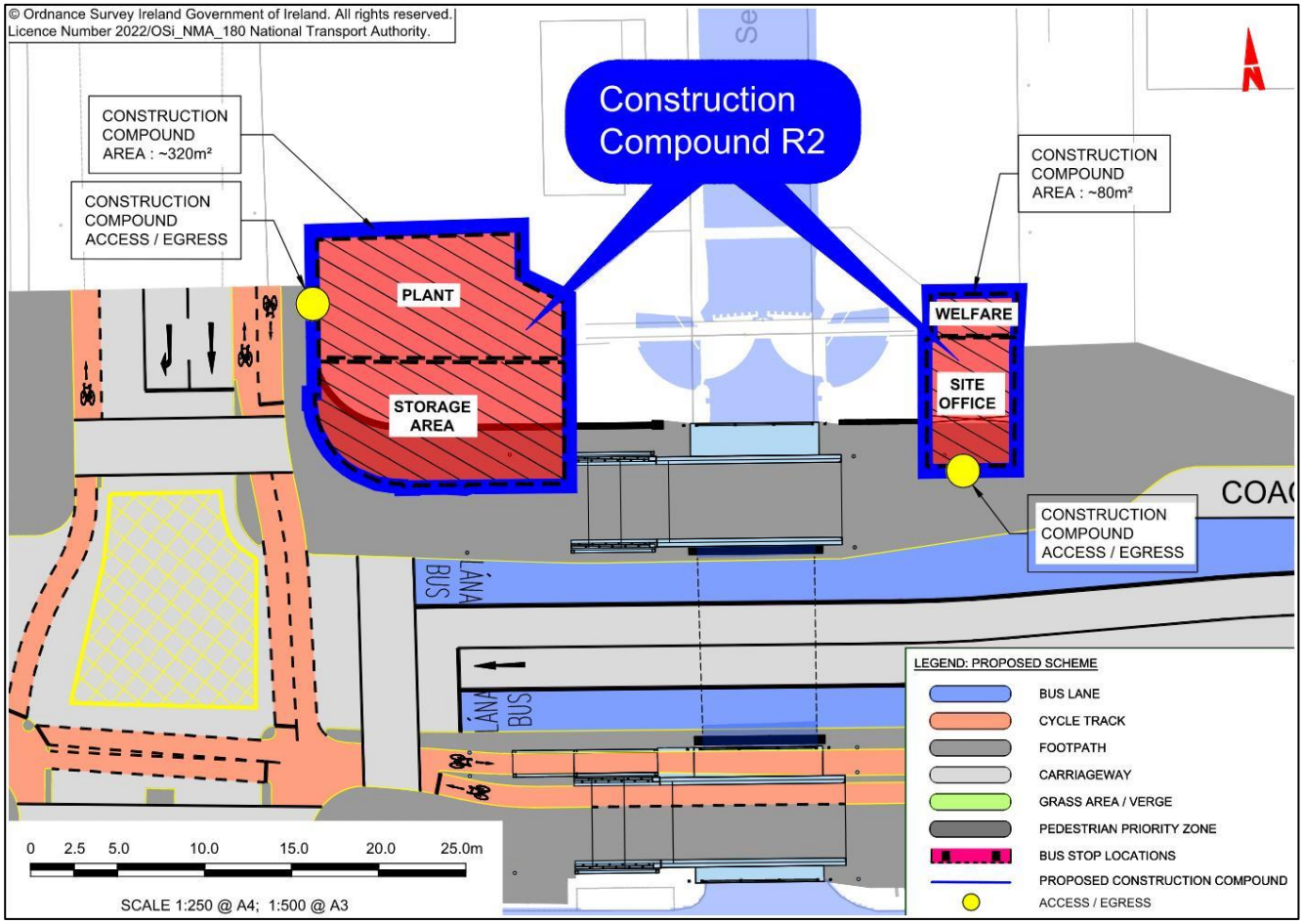

Image 7.3: Location and Extent of Construction Compound R2

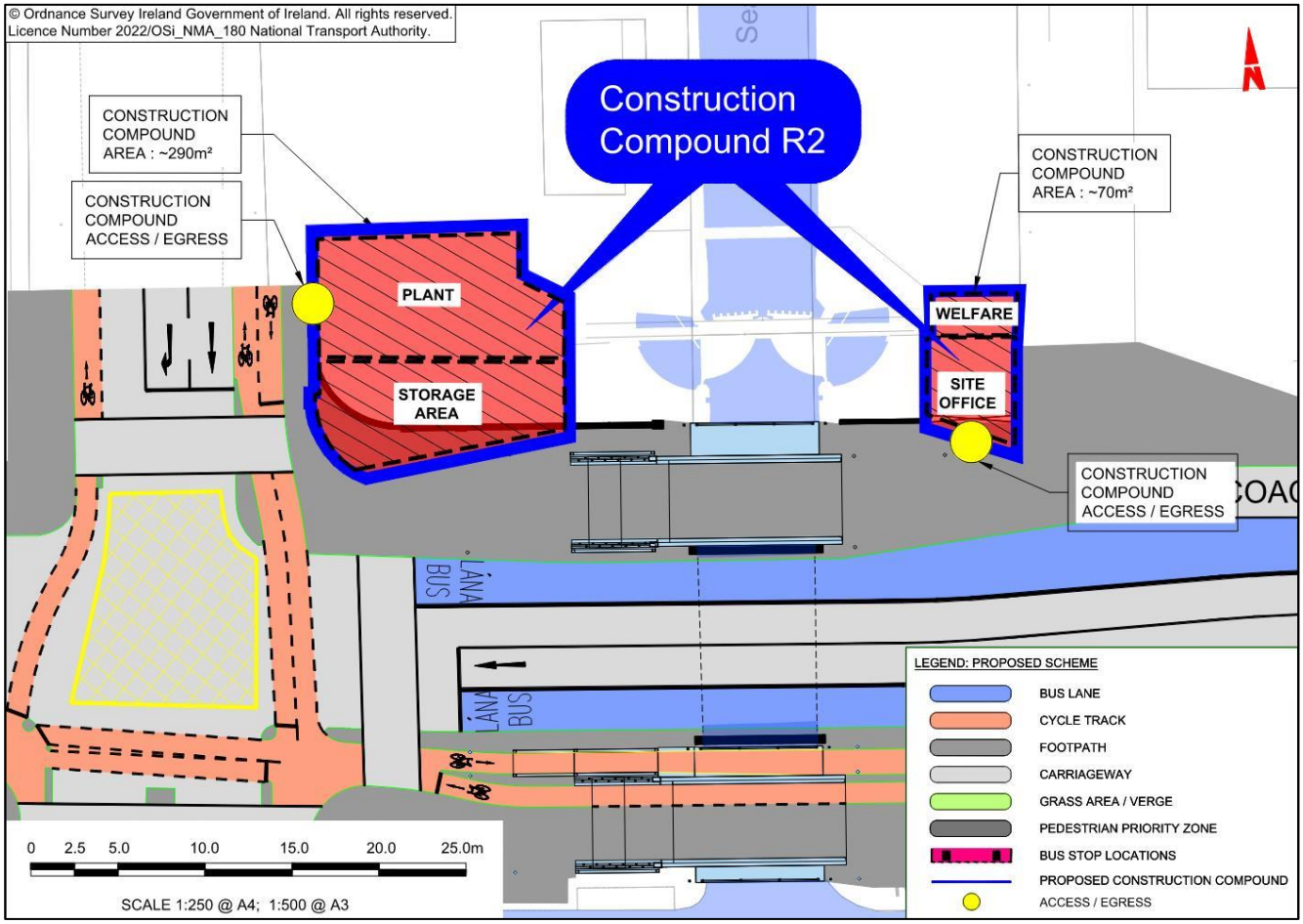

Image 7.4: Location and Extent of Construction Compound R2 After Relocation of Scherzer Bridges

Construction Compound R3 will be located at the end of Sir John Rogerson's Quay, as shown in **Image 7.5**. Construction Compound R3 has been split into two separate construction compounds (Construction Compound R3a and Construction Compound R3b) as it is envisaged that the DPTOB will be constructed under a separate Construction Contract from the remainder of the Proposed Scheme. Construction Compound R3a will be used to complete the works along the south quays; City Quay and Sir John Rogerson's Quay. Construction Compound

R3b will be used to complete the works at DPTOB. The area of Construction Compound R3a is approximately 1,940m^2, while the area of Construction Compound R3b is approximately 1,750m^2.

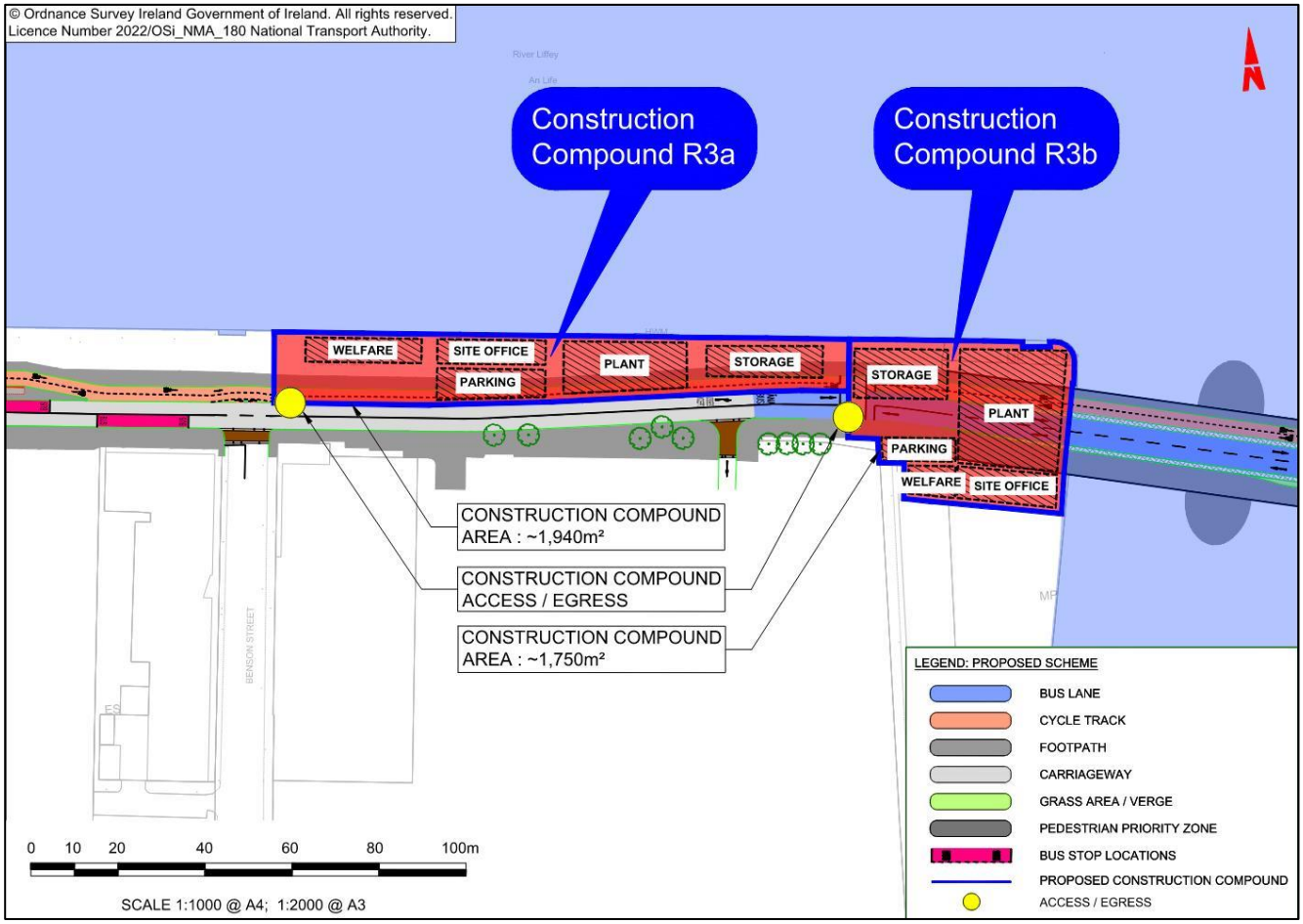

Image 7.5: Location and Extent of Construction Compound R3a and Construction Compound R3b

Construction Compound R4 will be located southwest of the Tom Clarke East Link Bridge. The Construction Compound R4 layout and boundary will change throughout the construction programme of the DPTOB. Whilst reclamation works, construction of the new SPRC building, and demolition of the old SPRC building are underway, a smaller Construction Compound (approximately 850m^2) will be established, as shown in **Image 7.6**. Once these works are complete, the Construction Compound size will increase to approximately 2,490m^2, as shown in **Image 7.7.**

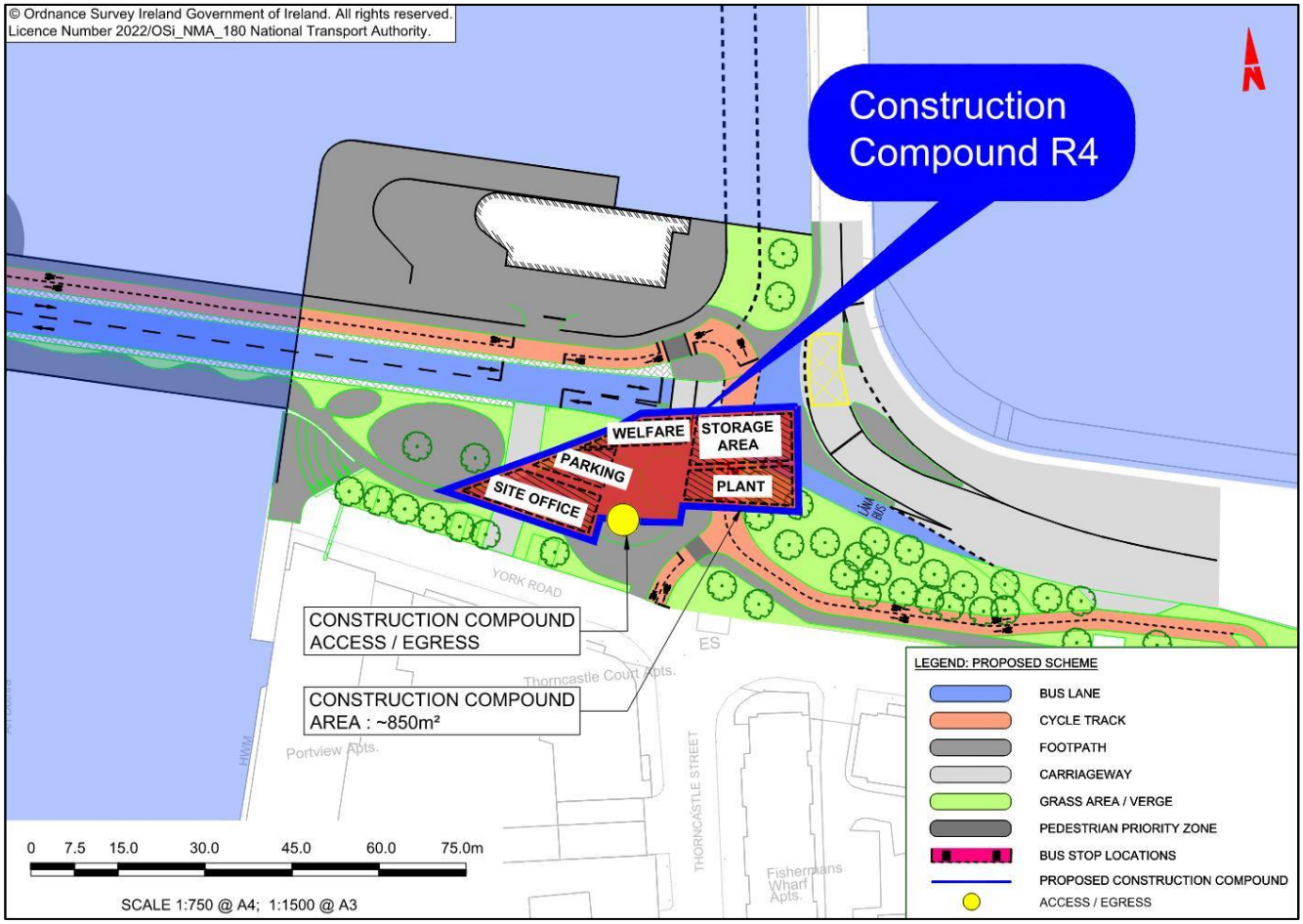

Image 7.6: Location and Extent of Construction Compound R4 (start of the DPTOB construction programme)

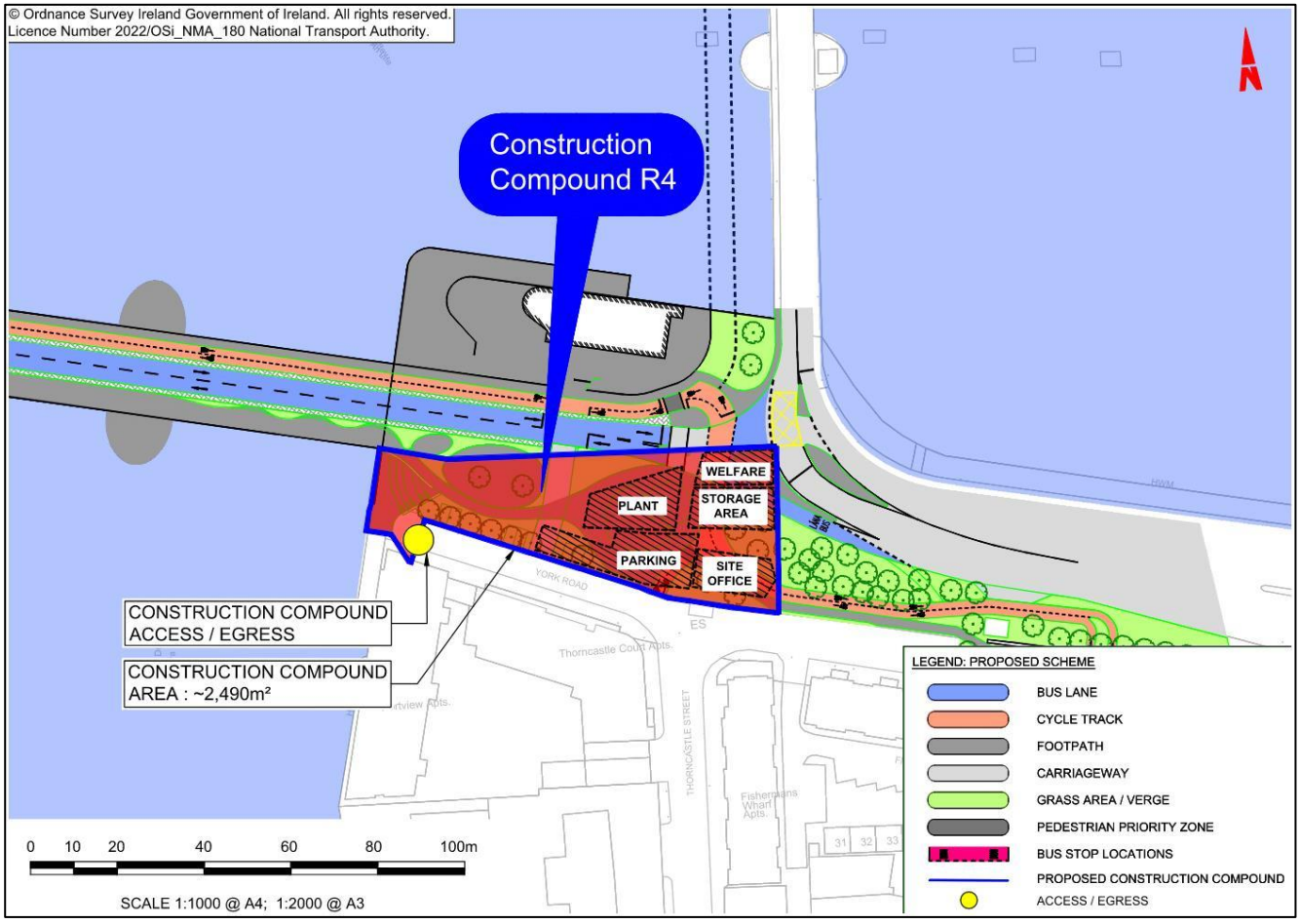

Image 7.7: Location and Extent of Construction Compound R4 (at end of the DPTOB construction programme)

7.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared which describes the overall environmental management strategy that will be implemented during the Construction Phase of the Proposed Scheme. The CEMP includes the mitigation measures which will be implemented to provide environmental protection during the Construction Phase of the Proposed Scheme. The CEMP addresses construction traffic management, resource and waste management, invasive species management, surface water management and environmental incident response measures.

The CEMP will be updated by the NTA (the Employer for the construction works) prior to the commencement of the Construction Phase, so as to include additional measures required pursuant to conditions attached to any decision to grant approval. The NTA shall set out the Employer's Requirements in the Construction Contract including all applicable mitigation measures identified in this EIAR, as well as any additional measures required pursuant to conditions attached to any decision to grant approval.

The CEMP has regard to the guidance contained in the TII Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, and the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

7.2 Construction Traffic Management Plan

A Construction Traffic Management Plan has been prepared, to demonstrate how the interface between the public and construction-related traffic will be managed and how vehicular movement will be controlled.

The roads and streets along the Proposed Scheme that will be upgraded will remain open to traffic, wherever practicable, during the Construction Phase. To maintain traffic movements, it will be necessary, in limited instances, to undertake some traffic diversions or lane restrictions locally to complete particular elements of the works.

Access to properties of owners / occupiers will be maintained as far as reasonably practicable. While there may be temporary constraints to access during the normal hours of work these will be communicated and arranged in consultation with the impacted users. Access for emergency vehicles will also be maintained.

Where footpaths are affected by construction, a safe route will be provided past the works area, and where practicable, provisions for matching existing facilities for pedestrians will be made. Where cycle tracks are affected by construction, a safe alternative route will be provided past the works area if practicable, although these facilities may not be of the same standard as those temporarily lost. Lengths without such provisions will be minimised so far as practicable and along which cyclists may be required to share the carriageway with vehicles.

The works will be completed on a sectional basis along the corridor such that no areas will experience an extended period of construction disruption over the approximate 30-month duration. NTA will facilitate pro-active communication of the scheduled planned works by the appointed contractor to ensure that impacted individuals, businesses and communities are kept aware of upcoming likely disruptions.

8. Environmental Impacts and Mitigation

The EIA process provides a valuable opportunity to reduce potential environmental impacts through design refinement, and this has formed an integral part of the design process for the Proposed Scheme, whilst ensuring the objectives of the Proposed Scheme are attained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development process has 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 environmental impact assessment can be carried out.

As outlined in Section 7.1, the NTA (the Employer for the construction works) shall set out the Employer's Requirements in the Construction Contract including all applicable mitigation measures identified in this EIAR, as well as additional measures required pursuant to conditions attached to any decision to grant approval. Procurement of the construction 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 appointed construction contractor will be required to plan and construct the Proposed Scheme works in accordance with the Employer's Requirements, and the NTA will employ an Employer's Representative team with appropriate competence to administer and monitor the construction contract for compliance with the Employer's Requirements.

The following sections provide a summary of the assessments 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 described:

- Traffic & Transport;
- Air Quality;
- Climate;
- Noise & Vibration;
- Population;
- Human Health;
- Biodiversity;
- Water;
- Land Soils Geology & Hydrogeology;
- Archaeological & Cultural Heritage;
- Architectural Heritage;
- Landscape (Townscape) and Visual;
- Waste and Resources;
- Material Assets;
- Risk of Major Accidents and / or Disasters; and
- Cumulative Impacts and Environmental Interactions.

8.1 Traffic & Transport

The traffic and transport impact assessment has two distinct parts: the physical changes to transport network; and the traffic modelling.

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

- The assessment of physical changes are as follows:
    - **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;
    - **Bus Infrastructure:** The changes to the quality of the bus infrastructure as a result of the Proposed Scheme; and

    - **Parking / Loading:** The changes to the availability of parking and loading as a result of the Proposed Scheme.
- The modelling-based assessments are as follows:
    - **People Movements:** 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;
    - **Bus Performance Indicators**: The changes to the projected journey times and reliability for buses as a result of the Proposed Scheme; and
    - **General Traffic:** The direct and indirect impacts on general traffic using the Proposed Scheme and surrounding road network.

For the Construction Phase temporary traffic management arrangements will be prepared in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks'. Measures to minimise the impacts associated with the Construction Phase will be implemented. A Construction Stage Mobility Management Plan, as described in the CEMP, will be prepared by the appointed contractor to encourage its personnel to travel to site by sustainable modes.

The assessment concluded that the impact during the Construction Phase will be Negative, Slight to Moderate, and Temporary in nature, and with the application of the proposed mitigation measures, the impact on traffic and transport will not be significant.

The impacts assessed for the Operational Phase determines how the Proposed Scheme integrates within the existing network and changes to traffic flows in the direct and indirect study area. The assessment demonstrates the following:

- **Pedestrian Infrastructure:** Overall, the improvements to the quality of the pedestrian infrastructure along the Proposed Scheme will have a Positive, Slight, and Long-term effect;
- **Cycling Infrastructure:** Given the quality of the existing cycling infrastructure along the Proposed Scheme, the improvements will have a Positive, Moderate and Long-term effect across the Proposed Scheme;
- **Bus Infrastructure:** The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure across the Proposed Scheme will have a Positive, Imperceptible to Profound and Long-term effect;
- **Parking and Loading:** Given the nature of the loss in parking and the availability of alternative spaces, the impact is expected to have a Negative, Imperceptible to Moderate and Long-term effect across the Proposed Scheme;
- **People Movement:** Overall, it is anticipated that the increases to the total number of people travelling through the Proposed Scheme will have a Positive, Significant and Long-term effect.
- **Bus Network Performance:** Overall it is anticipated that the improvements to the network performance for bus users along the Proposed Scheme will have a Positive, Very Significant, and Long-term effect.
- **General Traffic Network Performance:** Overall, it has been determined that the impact of the reduction in general traffic flows along the Proposed Scheme will be a Positive, Slight, and Long-term effect whilst the impact of the redistributed general traffic along the surrounding road network will have a Negative, Slight, and Long-term effect. Thus overall, there will be no significant deterioration in the general traffic environment in the area.

The Proposed Scheme will deliver positive impacts to the quality of pedestrian, cycling and bus infrastructure during the Operational Phase, improving people movement in line with the scheme objectives. These improvements will help to provide an attractive alternative to the private car and promote changes from the use of private cars to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the sustainable movement of people as population and employment levels grow in the future. The scheme design has been developed with cognisance of the relevant accessibility guidance and universal design principles so as to provide access for all users.

Although it is recognised that there will be some negative impacts for general traffic and parking / loading availability, the Proposed Scheme has been designed with the relevant traffic and transport guidelines. The

assessment demonstrates that there will be no significant deterioration in the general traffic environment in the study area as a consequence of meeting the scheme objectives of providing enhanced sustainable mode priority along the direct study area.

Given that the Proposed Scheme results in a positive impact for walking, cycling, bus and people movement, mitigation and monitoring measures have not been considered beyond those already incorporated as part of the Proposed Scheme. The impacts to general traffic and parking / loading, including mitigation measures are incorporated into the Proposed Scheme and no further mitigation measures are considered to be required.

Additional analysis undertaken using the Proposed Scheme transport models has shown that the new bus infrastructure facilitates a significant level of resilience for bus services that will use the Proposed Scheme, from implementation into the future. The Proposed Scheme will provide a higher level of protection to bus journey time consistency and reliability and will allow the service pattern and frequency of bus services to be increased into the future to accommodate additional demand without having a significant negative impact on bus journey time reliability or the operation of cycle and pedestrian facilities.

8.2 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 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.

The impacts assessed for the Construction Phase include dust emissions from activities such as site clearance, demolition, utility diversions, road and junction construction works, and landscaping. Appropriate mitigation measures to ensure that construction dust nuisance is minimised will be implemented for the duration of the Construction Phase.

Air quality impacts associated with the Construction Phase traffic and changes in traffic flows have also been assessed. The assessment concluded that Construction Phase traffic emissions will be neutral overall in the study area, with some moderate adverse impacts locally. However, a worst-case scenario has been modelled, where in reality the works will be temporary / short-term in nature. Due the nature of such impacts, no specific construction phase mitigation measures for construction traffic are required. The assessment identifies a generally Neutral, not significant and short-term impact on air quality as a result of Construction Phase of the Proposed Scheme.

No mitigation measures are required during the Operational Phase as the assessment identified that the majority of modelled receptors are predicted to experience negligible impacts on air quality in the vicinity of the Proposed Scheme, which is therefore neutral overall in the study area. In 2043, all modelled receptors are expected to have ambient air quality in compliance with the ambient air quality values, with no substantial or moderate adverse impacts expected as a result of the Operational Phase of the Proposed Scheme. The assessment concludes that the overall impact on air quality along the Proposed Scheme during the Operational Phase is Neutral and Long-term.

8.3 Climate

Climate is defined as the average weather over a period of time. Climate change is a significant change to the average weather, and while climate change is a natural phenomenon, human activities in recent years have negatively impacted on the climate, through the release of greenhouse gases.

The climate assessment involved a review of greenhouse gas emissions, a review of applicable guidelines and predictive calculations to assess climate impacts. The Proposed Scheme was also assessed in terms of its vulnerability to climate change.

The impacts assessed during the Construction Phase included emissions from activities such as site clearance, utility diversions, road widening and excavation works (where required), works at junctions and landscaping.

Construction traffic routes were also assessed as part of the assessment. Construction traffic and the embodied carbon (i.e., the total energy required to make / produce any product or services) for any construction materials required will be the main sources of greenhouse gas emissions during construction.

Mitigation measures have been incorporated into the construction design with the goal of reducing the embodied carbon associated with the Construction Phase of the Proposed Scheme. These mitigation measures include the replacement, where feasible, of concrete containing Portland cement with concrete containing ground granulated blast furnace slag.

The Proposed Scheme is estimated to result in total Construction Phase greenhouse gas emissions of approximately 12,771 tonnes embedded CO_2eq for materials over the approximate 30-month construction period, equivalent to an annualised total of 0.008% of Ireland's non-ETS 2020 target and 0.047% of the 2030 Transport Emission Ceiling.

Following the application of these mitigation measures, it is expected that there will be a Negative, Minor Adverse and Short-term residual impact on climate as a result of the Construction Phase of the Proposed Scheme.

The Proposed Scheme will be an enabler to allow for further reductions in car mode share with corresponding transfer to public transport, walking and cycling modes. This can be achieved through signal optimisation, increased bus frequency, further growth in cycling and demand management measures. A greater increase in sustainable mode share will in turn lead to further reductions in GHG emissions, beyond those reported in the above assessment. The Proposed Scheme has the potential to reduce GHG emissions equivalent to the removal of approximately 11,140 and 13,670 car trips per weekday from the road network in 2028 and 2043 respectively, This has the effect of a reduction in total vehicle kilometres, a reduction in fuel usage, and increases to sustainable trips and modal share in accordance with the 2023 Climate Action Plan.

The maintenance GHG emissions associated with the Operational Phase of the Proposed Scheme is predicted to generate 0.188 kt CO_{2eq} over the predicted 60-year lifespan. The annualised emissions due to the ongoing maintenance of the Proposed Scheme will reach, at most, 0.00001% of Ireland's non-ETS 2030 emissions target and 0.00005% of the 2030 Transport Emission Ceiling. Following the implementation of mitigation, this impact is predicted to be Negligible and Permanent.

Overall, when the carbon emissions associated with the maintenance phase and the Operational Phase are combined, the net greenhouse gas emissions will be Negligible and Permanent. Thus, the residual Operational Phase traffic impact as a result of the Proposed Scheme will be Negligible and Permanent.

The CBC Infrastructure Works will also support the delivery of government strategies outlined in the Climate Action Plan and the 2021 Climate Act by enabling sustainable mobility and delivering a sustainable transport system, aligning with aims to provide enhanced walking, cycling and bus infrastructure on key access corridors in the Dublin Region. This will subsequently enable and deliver integrated sustainable transport movement along these corridors. The CBC Infrastructure Works will provide connectivity and integration with other public transport services leading to more people availing of public transport.

By creating a resilient, accessible public transport network, BusConnects will provide an attractive alternative to private car travel, encouraging more passenger travel by more sustainable modes. As a result, a greater share of the demand will be by sustainable modes (i.e., public transport, walking and cycling).

8.4 Noise & 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 of the Proposed Scheme.

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. There are no notable sources of vibration in the surrounding environment. Road traffic along the existing road network generates a negligible level of vibration that would not be perceptible to building occupants.

The potential impacts assessed for the Construction Phase included the generation of noise and vibration from demolition, piling, utility diversions, road resurfacing and realignments road widening 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 appropriate use of acoustic enclosures or screens where required to reduce noise as well as noise monitoring at sensitive receptors close to the working areas. The monitoring of vibration at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values.

Following the application of the mitigation measures, noise impacts associated with the Construction Phase will be of Negative, Not Significant to Slight, and Temporary impact during all key day-time construction phases, with the exception of road widening and utility works which are Negative, Slight to Moderate and Temporary within 20m distance to the works during daytime periods.

During evening periods, noise impacts associated with the Construction Phase will be of Negative, Not Significant to Slight, and Temporary impact during general road works, quiet street treatment, urban realm and bored piling works at distances greater than 15m from the works. During this period, noise impacts associated road widening and utility diversion works will be of Negative, Moderate to Significant, and Temporary impact at distances between 15m to 20m from the works and within 15m of all other assessed activities. At distances within 10m of road widening / utility diversion works, the noise impact is Negative, Significant to Very Significant and Temporary. As per DMRB Noise and Vibration (UKHA 2020) in cases of moderate to major magnitude of impacts, the duration of works determines the overall significance rating. As part of the mitigation measures, the durations advised in the DMRB Noise and Vibration (UKHA 2020) will be followed, where practicable, to reduce overall significance of effects (i.e., scheduling works to occur for periods of less than ten days/nights over 15 consecutive day/night periods and less than 40 days over six consecutive months where significant effects are identified). Once the construction noise limits and duration of works is considered in line with the DMRB Noise and Vibration (UKHA 2020) all key Construction Phase residual noise levels are not significant, whilst meeting the scheme objectives.

For the works specific to the construction of the DPTOB, once the various mitigation measures are put in place and the threshold values complied with, noise impacts associated with the Construction Phase during daytime periods will be of Negative, Not Significant to Moderate, and Temporary impact during all key construction phases, with the exception of sheet piling, bored piling, demolition of the existing SPRC house and main structural works using excavators and asphalt pavers, which are Negative, Significant to Very Significant and Temporary at NSLs within 15m and 25m distances respectively to the works.

During evening period, noise impacts associated with the Construction Phase of the DPTOB will be of Negative, Significant to Very Significant, and Temporary impact between 25m to 50m of works involving high intrusive noise level works (i.e., during sheet piling, demolition works and approach structure works), and between 15m to 25m of main structural works involving use of bored piling, excavators, and asphalt pavers. During this period, noise impacts associated with sheet piling and demolition of the existing SPRC house will be of Negative, Very Significant to Profound, and Temporary impact at distances within 15m from the works to the east of the DPTOB.

The assessment has indicated that the use of standard construction activities can operate comfortably within the recommended vibration limits for standard residential and other light-framed buildings. With the adoption of best practice methodologies, vibration impacts at the most sensitive premises can be adequately mitigated to within acceptable levels relating to disturbance, whilst meeting the scheme objectives.

The impacts assessed during the Operational Phase relate to changes in traffic noise levels along the Proposed Scheme as a result of reconfigured cross sections to include new or upgraded bus lanes and predicted changes in traffic movement. The Proposed Scheme aligns with policy objectives to reduce populations exposure to traffic noise across the city through the incorporation of improved public transport, and increasing bus, train, and bicycle journeys.

Once operational (2028), there will be a direct, Positive, Imperceptible to Slight, Short to Medium-term impact along the Proposed Scheme in regards to changes in traffic noise levels, while in the surrounding network, an

indirect, Positive, Imperceptible to Slight and Short, Medium and Long-term to Negative, Moderate, Short to Medium-term impact is reported.

The results of the noise assessment for the design year (2043) Operational Phase have determined that long-term changes in traffic noise levels will be Positive, Imperceptible and Long-term (direct) to Negative, Slight and Long-term (indirect) along the Proposed Scheme and Positive, Imperceptible and Long-term to Negative, Slight to Moderate and Long-term (indirect) in the surrounding network. Thus, there are no significant adverse residual Operational Phase noise impacts associated with the Proposed Scheme in the long-term.

8.5 Population

The population assessment considered impacts on residential properties, community facilities and commercial businesses within the study area. The Population study area comprised 6 community areas: Pro Cathedral, City Quay, Sean McDermott Street, Seville Place – North Wall, Ringsend, and Sandymount.

The Proposed Scheme commences in the community areas of Pro Cathedral, City Quay and Seville Place – North Wall orientating eastwards along the north and south quays towards the communities of Ringsend and Sandymount. Once an area of heavy industry and maritime activity, these areas are now considered one of the most modern and contemporary of the city centre of Dublin. At the Tom Clarke East Link Bridge, the Proposed Scheme extends to the east and south along two separate alignments within the community area of Ringsend. The southernmost alignment terminates in the community area of Sandymount where it is planned to tie into the East Coast Trail at the junction of Beach Road and Sean Moore Road.

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

- Indirect amenity impacts on residential, 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 business viability;
- Temporary and permanent land acquisition from residential properties, community facilities and commercial businesses including reduction of front garden areas, driveways, private landings, and private parking spaces; and
- 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.

In regard to impacts on amenity during the Construction Phase, a Negative, Moderate / Significant and Short-term residual impact is expected in the community areas of Seville Place and Ringsend (around the DPTOB only). Furthermore, a Negative, Moderate and Temporary / Short-term residual impact is anticipated within the community areas of City Quay and Ringsend (and small parts of the community areas of Pro Cathedral and Sandymount). Community and commercial receptors within these community areas will experience these residual impacts.

The assessment of land take impacts during the Construction Phase of the Proposed Scheme concluded that there will be no significant negative residual impacts on any community areas as a result of the construction of the Proposed Scheme. However, Negative, Moderate and Short-term residual impacts are expected on the Trinity College Dublin (Stack B Building) while a Negative, Slight and Short-term residual impact is anticipated on the Jeanie Johnston and National Convention Centre. In terms of accessibility, the assessment of potential Construction Phase impacts concluded that there was likely to be a Negative, Moderate and Temporary residual impacts for cyclists, bus users and private vehicle users in the community areas of Seville Place – North Wall, City Quay and Ringsend (and small parts of the community areas of Pro Cathedral and Sandymount).

In terms of impacts on amenity during the Operational Phase, no significant negative residual impacts are anticipated in any of the community areas along the Proposed Scheme however commercial receptors located at the junctions of Cathal Brugha / Cumberland Street North / Sean McDermott Street Upper on Cathal Brugha Street and Townsend Street / Moss Street / Shaw Street on Townsend Street are expected to experience a Negative, Moderate and Long-term residual impact from redistributed traffic resulting from the operation of the Proposed Scheme.

During the Operational Phase, the assessment of land take impacts identified a residual Negative, Moderate and Long-term impact on Capital Dock Park as a result of the Proposed Scheme. In respect to accessibility, the assessment concluded that in the community areas of Seville Place – North Wall, City Quay and Ringsend, cyclists are likely to experience a Positive, Moderate and Long-term residual impact on accessibility, while bus users are considered to be assigned a residual impact of Positive, Imperceptible to Profound and Long-term.

Broadly speaking, 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 to walking, cycling and public transport, allowing for greater capacity along the corridor to access residential, community and commercial receptors.

8.6 Human Health

The interaction of factors such as individual characteristics, lifestyle and 'wider determinants of health' (the physical, social, and economic environment) have an important influence on the health of a population. These are illustrated in **Image 8.1.**

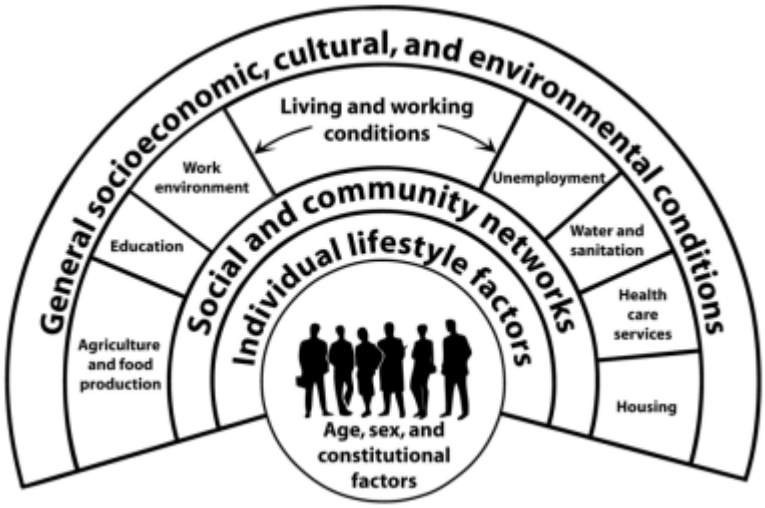

Image 8.1: Wider Determinants of Health

A related issue is that of social inequalities of health, which are the unfair and avoidable differences in health status across groups in society. The aim of this assessment was to identify the wider determinants of health that would likely be affected by the Proposed Scheme and how those impacts are associated with health outcomes.

Currently, Dublin's population has a better overall health status than average for Ireland with lower death rates.

Levels of air pollution within Dublin are almost entirely within the EU limit values for nitrogen dioxide and particulate matter.

Exposure to traffic noise causes annoyance and, in very high levels of exposure, is linked to several other adverse health outcomes. There is widespread exposure in the study area to noise levels which exceed the levels set by the World Health Organization to prevent adverse health outcomes. However, the noise levels experienced are typical of an urban environment.

Temporarily increased traffic congestion because of traffic management measures and diversions during construction will likely cause frustration and annoyance particularly for commuters and people travelling to appointments. Construction noise and vibration, as well as dust may cause annoyance for some nearby residents and workers. The temporary to short-term nature of these impacts means that no lasting impact on health is likely.

There may be a requirement for some works to take place at night. This will temporarily increase the likelihood of sleep disturbance in the nearby residential population as a result of noise associated with the construction works.

During the day there is risk of sleep disturbance for shift workers due to construction noise. Mitigation measures to control and limit noise associated with the construction works are included in the EIAR.

The need for pedestrian and cycle diversions around areas of construction works may increase the risk of collisions, unless appropriately designed and managed. Cyclists and pedestrians are more vulnerable to injury and death in the event of a collision and so need greater protection. Construction traffic management has been considered to outline measures deemed necessary to provide protection for pedestrians and cyclists in each location of the Proposed Scheme. With these measures in place the risks will be mitigated. Since the construction works will be temporary and short-term overall, 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 in Dublin.

No other health effects are considered likely from the construction phase of the Proposed Scheme.

The Proposed Scheme will create opportunities for building in regular physical activity into daily life through the improved pedestrian and cycling facilities, as well as through walking to and from bus stops. It is predicted that this will result in positive health outcomes as some people will change their travel behaviours and benefit from increased regular physical activity as a result.

With mitigation in place, people living near some of the proposed new bus stops may experience a new noise source. A small proportion of residents may experience an increase in traffic noise from redirected traffic along some side streets. However, for most people, there will be no perceptible change in environmental noise from the Proposed Scheme.

Reductions in general through-traffic, improved pedestrian infrastructure and improvements to the streetscape are likely to encourage more social interaction along the Proposed Scheme, resulting in positive health outcomes such as good mental wellbeing. The new public transport infrastructure is expected to bring improved journey times and improved reliability for public transport journeys, resulting in improved mental health outcomes such as reduced stress, as well as improved access to health, employment, education, and leisure services.

The inclusion of bus priority measures and improvements to pedestrian and cyclist infrastructure will support safer and more equitable access for those who do not or cannot use a car. This is expected to have positive impacts on health, by addressing these wider determinants and health inequalities. In addition the urban environment would be improved and easier to use for a wider variety of pedestrians, including the visually impaired, wheelchair users and the persons with mobility impairment.

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

8.7 Biodiversity

The biodiversity (ecology) assessment included a review of available published data to identify any features of ecological value and field surveys of habitats, bats, ground mammals, birds, amphibians (frogs and common newts) and reptiles.

The Proposed Scheme does not overlap with any nature conservation sites of European importance (European sites). The nearest European sites to the Proposed Scheme are the South Dublin Bay and River Tolka Estuary SPA and the South Dublin Bay SAC, which are both located approximately 0.5km south-east of the Proposed Scheme. These European sites are hydrologically connected to the Proposed Scheme via the Liffey Estuary Lower waterbody. The South Dublin Bay and River Tolka Estuary SPA is approximately 2.4km downstream of the Tom Clarke East Link Bridge and the South Dublin Bay SAC is located approximately 3.2km downstream to the east. Therefore, there is no potential for direct habitat loss or fragmentation during the Construction Phase of the Proposed Scheme.

The main habitats within the Proposed Scheme include tidal rivers, amenity grassland, tree lines, scattered trees and parkland and buildings and artificial surfaces. Desk studies and surveys identified:

- Two protected plant species within 1km of the Proposed Scheme, small cudweed *Filago minima* (waste ground species recorded in 2012, O1933) and opposite leaved pondweed

Groenlandia densa (historical records from the Grand and Royal Canals). None of which were recorded within the Proposed Scheme;
- Four non-native invasive species within 1km of the Proposed Scheme. Himalayan balsam *Impatiens glandulifera*, Japanese Knotweed *Reynoutria japonica*, sea-buckthorn *Hippophae rhamnoides* and three-cornered garlic *Allium triquetrum*. None of which were recorded within the Proposed Scheme;
- Five bat species (Leisler's, Common pipistrelle, Nathusius' pipistrelle (not recorded, but known to occur in the wider study area), Brown long-eared (not recorded, but known to occur in the wider study area), *Myotis* species (not recorded, but known to occur in the wider study area, especially Daubenton's Bat) Soprano pipistrelle and an unidentified pipistrelle species);
- No potential roost features (locations where bats rest);
- No evidence of badgers;
- Otter were sighted during surveys;
- Five sightings of marine mammals were recorded during surveys. Harbour and grey seal have been recorded in the vicinity of the Proposed Scheme and harbour porpoise has been recorded further afield in Dublin Bay;
- No evidence of amphibians or reptiles;
- A total of 69 breeding bird species, in particular:
    - Peregrine falcon, which are known to nest in the Pidgeon Towers of the Poolbeg Generating Station, which is approximately 2.5km from the Proposed Scheme;
    - A common tern colony was recorded in 2018, 2019 and 2022 on the lock gates at Grand Canal Dock approximately 120m upstream of the Proposed Scheme;
    - Black guillemot populations, which are known to nest in crevices within sea walls along the north and south quays; and
    - Kingfisher, Sand Martin and Gull species;
- A total of 31 wintering bird species typically found in coastal, estuarine, and intertidal habitats within the Liffey Estuary Lower and Dublin Bay area.

Potential impacts on biodiversity during the Construction Phase of the Proposed Scheme may arise from:

- Site preparation and clearance;
- Removal of existing boundaries, pavements, lighting columns, bus stops, and signage;
- Protection and / or diversion of buried services;
- Road widening, pavement reconstruction, and kerb improvements;
- Construction of Custom House Quay pedestrian boardwalk;
- Construction of North Wall Quay pedestrian boardwalk;
- Deconstruction, relocation and reconstruction of the Scherzer Bridges at George's Dock and the Royal Canal;
- Construction of the DPTOB;
- Demolition and reconstruction of the SPRC Building;
- Installation of new bus stops and junction / roundabout modification;
- Property boundary reinstatement, signage replacement; installation of lighting columns; and,
- Landscaping and tree planting, and reinstatement of temporary land acquisitions.

A range of mitigation measures will be implemented to avoid or reduce negative impacts on biodiversity during the Construction Phase of the Proposed Scheme, including new tree planting. Invasive species management will be implemented to mitigate any risk of the Proposed Scheme contributing to the spread of invasive species during its Construction Phase.

The assessment concluded that with the application of the proposed mitigation measures, the impact on biodiversity during construction will not be significant beyond the local level with the exception of habitat loss associated with the area of reclaimed land that is required for the DPTOB, where this will have a likely significant effect. However, as the habitat loss is a negligible percentage of the total national area of this habitat and due to the fact that the national range of the habitat will not be reduced by this minor loss of area, the national conservation status of this habitat type will not be altered by this minor loss of area (habitat). Nonetheless, it is recognised that there will be a small loss of an Annex I habitat type and this is considered to be significant at the county geographic scale.

Potential impacts on biodiversity for the Operational Phase may relate to the presence and operation of traffic on roads within the Proposed Scheme, the introduction of new lighting in previously unlit areas, routine maintenance works, and an overall increase in impermeable surfaces.

The measures proposed to avoid or reduce negative impacts on biodiversity during the Operational Phase will include:

- Light spill will be minimized through lighting design around Ringsend Park and the DPTOB;
- New planting within the Proposed Scheme, as outlined in the design; and
- The implementation of sustainable drainage measures will help prevent habitat degradation.

The assessment concluded that with the application of the proposed mitigation measures, the impact on biodiversity during the Operational Phase will be not significant beyond the local level however the habit loss during the Construction Phase remains a permanent impact.

In addition, potential impacts on designated European sites are specifically assessed in the Natura Impact Statement (NIS), which also forms part of this application. The conclusion of the NIS is that following the implementation of the prescribed mitigation measures the Proposed Scheme will not, individually or in combination with other plans or projects, have any adverse effect on the integrity of any European sites in view of their conservation objectives.

8.8 Water

The water assessment involved a desk-based study and the completion of field surveys to establish the current surface water conditions to identify the likely impacts of the Proposed Scheme.

The Proposed Scheme will be located within the River Liffey catchment which is mainly urban and industrial in character. The waterbodies relevant to the Proposed Scheme are the:

- Liffey Estuary Upper, which is a transitional waterbody and is within the Liffey Nutrient Sensitive Area. It flows into Liffey Estuary Lower before reaching Dublin Bay. The waterbody covers an area of 0.2km^2 from the National War Memorial Garden to approximately 40m upstream of the Talbot Memorial Bridge, which marks the upstream limit of the Liffey Estuary Lower.
- Liffey Estuary Lower, which is a transitional waterbody and is within the Liffey Nutrient Sensitive Area. It is fed by the Dodder_050, Tolka Estuary and Liffey Estuary Upper and flows into Dublin Bay. The waterbody covers an area of 4.80km2 from Talbot Memorial Bridge to beyond the Poolbeg Lighthouse and North Bull Lighthouse where it drains into the Dublin Bay.
- Royal Canal Main Line (Liffey and Dublin Bay), which is an artificial waterbody (AWB), primarily used for recreation and was constructed in the 18th century, shortly after the Grand Canal. The Royal Canal is 146km long and runs from the River Liffey in Dublin to Cloondara on the River Shannon, with an 8km branch line into the town of Longford.
- Dodder_050 is the most downstream segment of the River Dodder, which has a total catchment area of 167.7km^2 and rises on the northern flanks of the Dublin Mountains, flowing north through the Upper and Lower Glenasmole reservoirs and onward through South Dublin, becoming tidal near Lansdowne Road before entering the River Liffey at Ringsend. The Dodder_050 segment is 29.6km long and stretches from Templeogue to its confluence with Liffey Estuary Lower close to the Grand Canal Basin.
- Dublin Bay, which is a United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserve. The Biosphere covers most of Dublin Bay (300km^2) and aims to ensure the protection of its water quality and biodiversity (Dublin Bay Biosphere 2020). There are a number of European designated habitats within Dublin Bay including North Dublin Bay SAC, South Dublin Bay SAC and the South Dublin Bay and Tolka Estuary SPA. Bathing Waters within Dublin Bay comprise of Merrion Strand, Sandymount Strand, Dollymount Strand and Seapoint.

The current European Union Water Framework Directive (WFD) status of the waterbodies, and their At Risk (of not achieving its WFD objectives) status is as follows:

- Liffey Estuary Upper: has Good Ecological Status (GES), however, is At Risk of not maintaining GES;
- Liffey Estuary Lower: has Moderate Ecological Status, is At Risk of not achieving GES;
- Royal Canal: has Good Ecological Status, however its status is Under Review;
- Dodder_050: Moderate Status, is At Risk of not achieving GES; and
- Dublin Bay: has Good Ecological Status, is Not At Risk of maintaining Good Status.

The surface water along the Proposed Scheme corridor currently drains into a surface water system which discharges into Liffey Estuary Lower for the most part, with some small sections draining to combined sewer and onto Ringsend WwTP. The main existing pressure on water quality relates to urban runoff, overflows from the foul sewer network (emergency only) and other unknown anthropogenic pressures.

A Flood Risk Assessment has been completed for the Proposed Scheme which determined that the Proposed Scheme will be located in Flood Zone A where the probability of flooding from rivers and the sea is high.

The impacts assessed during the Construction Phase include impacts from construction runoff and watercourse disturbance due to utility diversions, road resurfacing and road realignments.

During the Construction Phase, the water quality of all five waterbodies could potentially be impacted by surface water runoff containing fine sediments, accidental spillages and accidental leakages of construction materials via surface water system connections. There is also the potential for disruption to local drainage networks if they are required to be diverted to allow construction works to take place.

Surface water management is addressed in the CEMP, which details control and mitigation 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; the control of runoff of fine sediments; the management of storage of materials / fuels, management of the batching and use of concrete; and the management of vehicles and plant. Additionally, site specific measures are proposed to avoid or reduce negative impacts related to the construction of the pedestrian boardwalks along Custom House Quay and North Wall Quay, the Scherzer Bridges at the Royal Canal and the Dodder Public Transport Bridge (DPTOB).

Following the implementation of the mitigation measures, no significant impacts are anticipated on any water body as result of the Construction Phase of the Proposed Scheme.

The impacts assessed during the Operational Phase include the potential surface water impacts associated with areas of impermeability and traffic displacement. During the Operational Phase, the design of the Proposed Scheme will ensure that there will be no net increase in surface water runoff rates to any of the connected waterbodies, using a combination of infiltration drains / trenches and oversized pipes.

In the Operational Phase, the infrastructure will be maintained by the Local Authorities, and will be subject to their management procedure. No additional mitigation is required, and no impacts are anticipated on any water body as result of the Operational Phase of the Proposed Scheme.

8.9 Land, Soils, Geology & Hydrogeology

The land, soils, geology and hydrogeology assessment included a desk-based study of publicly available information, historic ground investigations and scheme walkover surveys.

The geology (soils and rock) beneath the study area of the Proposed Scheme mainly comprises made ground, alluvium and glacial till derived from limestone which are underlain by limestone rock. The land within the study area is mainly used for urban developments, including but not limited to; industrial, commercial, residential, and recreational.

Aquifers (which store / produce groundwater) within the study area of the Proposed Scheme are classified as ‘Locally Important’ (moderately productive in local zones) in terms of their ability to produce water.

As the Proposed Scheme is in an urban environment, there is the potential for some contaminated ground in the study area. The assessment of contaminated land focused on the footprint and directly on either side of the Proposed Scheme unless there is likely to be a pathway connecting the possible source of contamination to the footprint of the Proposed Scheme. These potential sources are outlined and assessed.

The impacts assessed during the Construction Phase of the Proposed Scheme include:

- Loss or damage of topsoil;
- Excavation of potentially contaminated ground;
- Loss of future quarry or pit reserves;
- Loss or damage/contamination of parts of an aquifer; and
- Change to groundwater flows.

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 residual significant 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.

In the Operational Phase the infrastructure will be maintained by the local authority and will be subject to their management procedures to ensure that the correct measures are taken in the event of any accidental spillages, and this will reduce the potential for any impact.

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

8.10 Archaeological & Cultural Heritage

The archaeological and cultural heritage assessment included a desk-based review of published and unpublished documents, historical mapping, and a field survey, and has been carried out according to best practice and guidelines relating to archaeological and cultural heritage.

Fragmentary remains of prehistoric shoreline activity, including the remains of a Late Mesolithic fish trap and a mid-Neolithic wattle fence have been revealed through archaeological investigation at great depths at Spencer Dock on North Wall Quay. However, the archaeological and historical character of the wider area was formed in the post-medieval period with major reclamation project along the River Liffey in the late 17th and 18th centuries. The eastern expansion into what were formerly flood plains until the 17th century developed particularly in the 18th and 19th centuries and continued into the 20th century. The north side of the river is notable for its industrial development and later usage, which is characterised by the construction initially of the Royal Canal in the late 18th century and the subsequent development and expansion of the railway in the 19th century and associated port activity on the north docks. On the south side of the river, the focus of building and commercial enterprises was largely associated with the maritime industry, with the Grand Canal Dock project at the end of the 18th century proving less than successful. The Proposed Scheme extends over the confluence of the River Liffey and the River Dodder at Britain Quay (within the Dublin Historic City RMP ZAP (DU018-020)) and continues along the edges of the historic settlements of Irishtown (DU018-053) and Ringsend (DU018-054).

For the purpose of this assessment two underwater archaeological impact surveys have taken place (Appendices A15.5 and A15.6 in Volume 4 of this EIAR) to inform the decision-making process and impact assessment.

There are eight archaeological heritage features on the Records of Monuments and Places / Sites and Monuments Record, nine on the Dublin City Industrial Heritage Record, and 12 cultural heritage assets/ areas of archaeological potential that have the potential to be impacted within the Proposed Scheme.

The main potential impacts on archaeology and cultural heritage as a result of construction works could arise from:

- Pavement and quays construction, repairs and reconstruction works;
- Road resurfacing works;
- Piling into the ground for the foundations of new structures; and
- Any excavations of soil, including landscaping works and ground disturbance for utility works.

There is the potential for the discovery of previously unknown below ground archaeological features, materials, and deposits along the Proposed Scheme.

The mitigation measures proposed to avoid or reduce negative impacts on archaeological and cultural heritage during the Construction Phase include the provision for and funding of the necessary archaeological monitoring, inspection and excavation works that will be required prior to and during construction.

There will be no Operational Phase impacts as a result of the Proposed Scheme and no mitigation is required.

With the implementation of the proposed mitigation measures, it is expected that there will be no residual impacts on archaeological and cultural heritage.

8.11 Architectural Heritage

The architectural heritage assessment included a desk-based study including a review of all available relevant and published and unpublished documents, and field surveys, which were carried out to identify known architectural heritage sites, and to identify any previously unrecorded features.

From its starting point at Talbot Memorial Bridge, the Proposed Scheme will run through part of the historic city of Dublin, represented by Custom House Quay and North Wall Quay on the north side of the River Liffey, and by City Quay and Sir John Rogerson's Quay on the south side.

This section of the study area forms part of the industrial Docklands, which was developed following a land reclamation scheme initiated in the late 17th century, with the construction of warehouses and stores beginning in earnest following the building of the Custom House a century later. Navigation of the mouth of the River Liffey was a challenge to the early development of Dublin from its inception. Land reclamation activities date back to the Anglo Normans at Wood Quay, which was followed by a series of ambitious engineering proposals developed to address the problems of silting in the harbor through the seventeenth and eighteenth centuries.

What is now North Wall Quay, was constructed by the Ballast Office by 1717, following the completion of the Great South Wall and Poolbeg Lighthouse. Sir John Rogerson's Quay was completed as far as the mouth of the River Dodder by 1720. On both sides of the river, gridded streets or Lotts were laid out behind these quay walls. The completion of the South Bull Wall and the Custom House in 1791 consolidated the eastward expansion of the city. The construction of the canals, and later the railway, alongside improved port facilities supported the industrialization of the docks area.

The area around the quays developed with extensive warehousing in the nineteenth century, ensuring the docklands remained an important commercial and trading hub until the mid-20th century when the port was moved eastwards to its present location along with the introduction of roll-on-roll-off shipping techniques, the old port declined. The establishment of the Irish Financial Services Centre in the 1980s and the Dublin Docklands Development Authority in 1997 led to the rapid transformation of the docklands area in the early years of the 21st century.

The majority of the built heritage along the quays is nineteenth century and largely consist of warehouses such as those surviving at the CHQ (DCC RPS 2094), 82 North Wall Quay (DCC RPS 5842), No. 2 Sir John Rogerson's Quay (DCC RPS 7543) and the Tropical Fruit Company (DCC RPS 7548), depots such as the former CIE Goods Depot (DCC RPS 5836) and shipping offices, B&J Steam Packet Offices (DCC RPS 7547), all of which are of industrial as well as architectural heritage interest.

There are also features associated with the quays including the quay walls (DU018-020564, NIAH 50060556, DU018-020479, DU018-020201 and CBC0016BTH039), campshire warehouses (BJ Marine NIAH 50020466-7) and machinery (the Royal Canal Scherzer Bridges (DCC RPS 912), George's Dock Scherzer Bridges (DCC RPS

896) the Diving Bell DCC RPS 7542) and embedded rails on North Wall Quay and Sir John Rogerson's Quay (CBC0016BTH029 and CBC0016BTH033), the Royal and Grand Canals and the railways (including the Railway Station building on North Wall Quay (DCC RPS 5836), the former British Rail hotel (DCC RPS 5838), and the point depot (DCC RPS 5843), now known as the 3Arena.

The Proposed Scheme extends beyond the Tom Clarke East Link Bridge at the end of Sir John Rogerson's Quay, along the south of the River Liffey (Dublin Port) and east of the River Dodder encompassing part of the urban residential villages of Ringsend and Irishtown.

Ringsend was built on an outlying gravel ridge as a fishing outpost of Dublin, separated from the city by the mouth of the Dodder River and its confluence with the River Liffey. In the 17th and 18th century Ringsend was a prosperous and busy village though it was prone to flooding until the completion of the South Bull Wall in 1756, with the original timbers replaced with Dalkey Granite in 1795. Ringsend was finally connected to Dublin via an embankment along the mouth of the River Dodder also around this period.

Industrial decline resulted in the decline of Ringsend in the early nineteenth century leading to severe overcrowding and unsanitary conditions. This was addressed through the provision of artisan dwellings, in twentieth century. Some fine examples of these survive in the study area, including Pembroke Cottages (CBC0016BTH016) and the cottages on Pigeon House Road (CBC0016BTH019), which were built by the Pembroke Estate, the more substantial two storey dwellings on Cambridge Avenue (CBC0016BTH036), St Patrick's Villas (CBC0016BTH021), St Brendan's Terrace (CBC0016BTH023), Strasburg Terrace (CBC0016BTH024) and Chapel Avenue (CBC0016BTH026). While St. Brendan's Cottages (CBC0016BTH022) have a more vernacular character, and terraces such as Bayview (CBC0016BTH028), and Bayview Terrace (CBC0016BTH020) have a restrained Victorian Style.

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

- Direct impacts to the boundaries (walls, railings etc.) of protected structures as well as the protected structures themselves (i.e. the Scherzer Bridges) and also other architectural heritage features where road widening is required;
- Direct impacts to street furniture (i.e. lamp posts, etc.) due to land acquisition, construction works to pavements, changes in the layout of footpaths and landscaping works;
- Indirect impacts as a result of the potential for damage to sensitive structures in areas where the construction works for the Proposed Scheme come into close contact with these structures;
- Indirect impacts as a result of the potential for damage to protected structures due to increased vibration from construction vehicles; and
- Visual impacts on the setting of protected structures or buildings or structures of architectural heritage interest, historic streetscapes and views which will temporarily impact on their setting during the Construction Phase.

The measures proposed to avoid or reduce negative impacts on architectural heritage during the Construction Phase will include:

- Appropriate recording, protection, removed only where required, storage and reinstatement of boundaries and street furniture as well as the Scherzer Bridges; and
- The retention or replacement of trees along the Proposed Scheme.

With the implementation of proposed mitigation measures, it is expected that there would be no significant negative direct residual impacts on architectural heritage, however there is expected to be a short term significant negative indirect residual impacts on the Liffey Quays Conservation Area, the Royal Canal Conservation Area and the Dodder Valley and Grand Canal Conservation Areas where construction activities will have an significant adverse visual impact on these designations during the Construction Phase.

The main potential impacts on architectural heritage during the Operational Phase will be:

- Impacts associated with visual changes on architectural heritage resources (including from the proposed locations of bus shelters which have been carefully considered), as well as impacts on the setting of these resources due to traffic changes. New paving, new tree planting and

landscaping will generally have a positive impact on the historic environment and character of streets along the Proposed Scheme; and
- Impacts where the Proposed Scheme requires physical changes to, or the repositioning of, heritage features.

Mitigation measures have been inherently included during the design development. These include an analysis of existing and proposed bus-stops, bus-shelters, and signal pole locations to avoid impacting on the settings of identified sites, buildings, and features. Therefore, no significant Operational Phase impacts are anticipated during the Operational Phase and therefore no mitigation measures are required during the Operational Phase. There are no significant negative residual impacts anticipated during the Operational Phase of the Proposed Scheme.

8.12 Landscape (Townscape) & Visual

The landscape (townscape) and visual assessment included a desk-based review of available information including aerial photography and mapping of the Proposed Scheme. Route walkovers were carried out to verify desk-based findings and this included field surveys and the preparation of photomontages.

Along the first section of the Proposed Scheme between Talbot Memorial Bridge to Tom Clarke East Link Bridge the townscape is made up of riverside quays with modern and emerging development defining a new urban corridor. There are notable views west towards the city and to the east towards Dublin Port and adjacent industrial lands including the iconic Poolbeg Towers. The Samuel Beckett Bridge and Seán O'Casey Bridge are landmark structures across this section of the river.

The second section of the Proposed Scheme at the confluence of the River Liffey and River Dodder comprises the proposed DPTOB, where the townscape is composed mainly of open water, with areas of public open space present to both sides. There are views up the River Dodder corridor and to the sea-locks at the entrance of Grand Canal Docks. The clubhouse and jetty of St Patricks Rowing Club (SPRC) is present to the east of the confluence.

The third and final section of the Proposed Scheme from Tom Clarke East Link Bridge to Sean Moore Road, the character is informed by the open water / port-edge coastal context backed by established residential dockland suburbs. The significant open space amenity of Ringsend Park and Irishtown Stadium sits at the centre of the area and connects via linear open space through to Sean Moore Park. Ringsend and Irishtown comprise a traditional mix of one and two-storey cottages and houses generally with small front gardens and on-street parking, though some larger properties with off-street parking are also present. These suburbs are typically of one or two-storey terraced and semi-detached traditional properties, often framing attractive narrow streets. Townscape is more developed along the port / coast edge and enclosing large suburban parkland.

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

- Site mobilisation and establishment, fencing and hoarding of the Construction Compound 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 Compound;
- 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 Construction Compounds.

Construction of the Proposed Scheme will not require any land acquisition (temporary and / or permanent) from residential properties however, there will be demolition of the existing SPRC and reconstruction of a new clubhouse and jetty on adjacent land reclaimed from the River Liffey.

Appropriate measures to avoid or reduce negative landscape (townscape) and visual impacts during the Construction Phase will be implemented, including ensuring that trees and vegetation to be retained within and adjoining the works area will be protected. Works required within the root protection area (RPA) of trees to be retained will follow a project specific arboricultural methodology for such works, as outlined in Appendix A17.1 (Arboricultural Impact Assessment) in Volume 4 of this EIAR.

While mitigation for the Construction Phase is focused on protecting any landscape features that are to be kept and providing as much visual screening from construction works as possible, it will not be possible or practical to mitigate against impacts on landscape (townscape) and visual characteristics resulting from the removal of mature trees to facilitate construction or relocation or construction of bridges.

With the implementation of the proposed mitigation measures, it is expected that there will remain to be Negative, Moderate to Very Significant, and Short-term residual impacts on townscape as a result of the construction of the Proposed Scheme. Negative, Moderate / Significant and Temporary / Short-term residual impacts are anticipated along the Talbot Memorial Bridge to Tom Clarke East Link Bridge section of the Proposed Scheme, while the townscape of the area along the section of the Proposed Scheme between Tom Clarke East Link Bridge and Sean Moore Road is anticipated to have a Negative, Moderate and Temporary / Short-term residual impact. A Negative, Very Significant and Temporary / Short-term residual impact is also expected on townscape in the area of the confluence of the River Liffey and River Dodder given the scale of construction activities required to construct the DPTOB.

In addition to these impacts, there is expected to be Negative, Moderate to Very Significant and Temporary / Short-term residual impacts on conservation areas, protected structures, amenity designations along the campshires and at the open space at York Road / Tom Clarke East Link Bridge, protected / scenic views, properties fronting onto the Proposed Scheme and trees and vegetation.

The main potential landscape (townscape) and visual impacts during the Operational Phase will include:

- Alterations in the physical and visual character of the corridor of the existing road / street;
- Changes in the location and presentation of the Scherzer Bridges;
- Introduction of the pedestrian boardwalks to Custom House Quay and North Wall Quay;
- Introduction of the DPTOB across the confluence of the River Liffey and River Dodder;
- Modifications in areas of amenities, tree plantings, properties, boundaries; and
- Changes in traffic, pedestrian, and cycle movements.

Alterations in the road corridor and changes in traffic, pedestrian and cycle movements will be features of the Proposed Scheme. Changes in road corridors, including in traffic signalisation, signage, and in carriageway allocation and traffic movements are a common and regular aspect of active road and traffic management in urban roads and streets. Therefore, such aspects may be considered as a dynamic part of the receiving streetscape environment. It is expected that there will be residual significant long-term impacts on the townscape of Section 1 (Talbot Memorial Bridge to Tom Clarke East Link Bridge) and Section 2 (DPTOB) of the Proposed Scheme as a result of the relocation of the Scherzer Bridges at George's Dock and the Royal Canal as well as the construction of the DPTOB, reporting Neutral, Slight / Moderate and Long-term and Neutral, Significant and Long-term residual impacts respectively. There will be locally significant, negative, long-term residual impacts on the Conservation Areas, protected structures, amenity designations along the campshires and the open space at York Road / Tom Clarke East Link Bridge, and properties fronting onto the Proposed Scheme.

The Proposed Scheme has been subject to an iterative design development process which has sought insofar as possible to avoid or reduce negative impacts, including townscape and visual impacts. Nevertheless, the Proposed Scheme will give rise to townscape and visual effects, most notably during the Construction Phase. These impacts arise especially where there is temporary and / or permanent acquisition of lands associated with the construction or relocation of structures along the Proposed Scheme. The Proposed Scheme includes for the replacement of disturbed boundaries, reinstatement of the Construction Compounds, return of temporary acquisition areas and for additional tree and other planting where possible along the Proposed Scheme.

In the Operational Phase, residual impacts will remain along the majority of sections comprising the Proposed Scheme, with the exception of Section 3 between the Tom Clarke East Link Bridge and Sean Moore Road. However, the Proposed Scheme will also provide for a significantly enhanced level of service for public transport

and for pedestrian / cycle connectivity. Likewise, the Proposed Scheme provides for improvements in the urban realm, which will provide positive long-term effects for the townscape and visual character along the route of the Proposed Scheme, particularly the campshires and the DPTOB.

8.13 Waste & Resources

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. The assessment included a desk-based review of relevant policy and legislation, and data on waste generation and waste and resources management.

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 Circular Economy Model (see **Image 8.2)** throughout the Construction and Operational Phases. This will ensure that waste generation will be minimised.

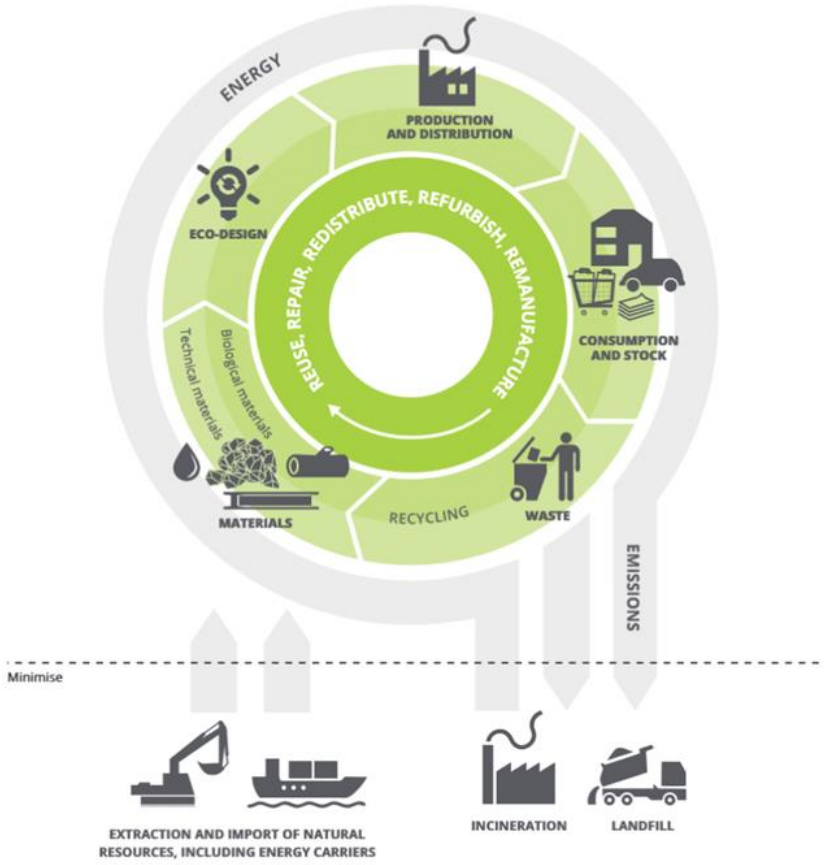

Image 8.2: The Circular Economy Model

In Ireland, the most recently available published data records that 8.2 million tonnes of construction and demolition waste was generated, an decrease of 0.6 million tonnes from 2019 (EPA 2022). Of this waste, 7 million tonnes comprised soil and stones, making up 84% of the material waste stream.

In Ireland, municipal waste (i.e. typical household waste types) is made up of household waste as well as commercial and other waste that, because of its type, is similar to household waste. According to the Environmental Protection Agency, Ireland generated 3.2 million tonnes of municipal waste and recycled 30% of this waste in 2020.

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

- Construction and reconstitution of cycleways, pathways, road widening and urban realm improvements;

- Removal of trees, concrete kerbs, walls, fences and gates;
- Modifications to signalised junctions;
- New street furniture, including traffic lights and bus stops, and landscaping works.
- Boundary walls, fences and gates will be constructed where required;
- Deconstruction and relocation of Scherzer bridges;
- Construction of boardwalk(s);
- Construction of the Dodder Public Transport Opening Bridge (DPTOB);
- Minor utility diversions and / or protections will be required; and
- Excavation of pavements and carriageways.

A range of mitigation measures will be implemented to avoid or reduce negative impacts on waste and resources during the Construction Phase, including minimising waste disposal. Opportunities for reuse of materials, by-products and wastes will be sought throughout the Construction Phase of the Proposed Scheme. This will be managed through the Construction Phase by the appointed contractor through the implementation of a Construction and Demolition Resource and Waste Management Plan (CDRWMP).

Approximately 180 tonnes of demolition waste will be generated as a result of the Proposed Scheme is equivalent to 0.002% of the C&D waste management baseline in the Eastern-Midlands Waste Region (EMWR). The predicted impact of Demolition Waste during the Construction Phase, is Adverse, Not Significant, and Short-term. The total forecast of surplus excavation material from the Proposed Scheme will be approximately 18,000 tonnes and is equivalent to 0.17% of the C&D waste management baseline for the EMWR. There is potential for incorporating reused aggregates in the Proposed Scheme, and this will be done where practicable. In addition, where possible the remaining material will be reused. The predicted impact of excavation waste during the Construction Phase is Adverse, Slight, and Short-term.

The main potential impacts on waste and resources during the Operational Phase will be waste generated from road maintenance activities following completion of the Construction Phase. Maintenance operations will be undertaken under the jurisdiction of the local authority and in accordance with their waste management plans. No additional mitigation or monitoring measures are considered necessary. The quantity of bitumen containing material generated, during the Operational Phase, over the assumed lifetime of the Proposed Scheme (assumed to be 60 years), will increase by approximately 794 tonnes. The predicted impact of operational construction and demolition waste will be Adverse, Not Significant, and Long-term.

With the implementation of the proposed mitigation measures, it is expected that there will be no residual significant impacts on waste and resources.

8.14 Material Assets

The material assets assessment was considered in terms of:

- Major utilities (both underground and overground) such as gas, water pipelines (drinking water pipelines and sewers) and storm water networks, electricity transmission lines and telecommunications lines;
- Manmade transport infrastructure such as roads and canals; and
- Raw materials that are required to be imported for the Proposed Scheme.

This assessment involved a desk based review of these material assets. Utility information was requested from relevant organisations and service providers.

Existing material assets within the Proposed Scheme include:

- Electricity Supply Board electricity lines (high, medium and low voltage) and associated infrastructure;
- Gas Networks Ireland gas mains (high, medium and low pressure) and associated infrastructure;
- Irish Water potable water mains and associated infrastructure;
- Irish Water sewer lines (foul and combined sewers) and associated infrastructure;
- Local Authority surface water drainage network and associated infrastructure;

- Eir, Enet and Virgin Media telecommunications lines and associated infrastructure;
- Local Authority district heating infrastructure; and
- Local Authority traffic signal ducting.

Within the site of the Proposed Scheme, material is currently imported as part of regular maintenance activities which are undertaken on the existing roads, cycle lanes, footpaths, utilities, and verges.

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

- 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 and spraying to prevent dust;
- The Construction Compounds will require telecommunications access;
- The diversion of electricity lines where there will be an interface with the Proposed Scheme works;
- The diversion of underground watermains where there will be interfaces with the Proposed Scheme works;
- Upgrade works required to the surface water drainage network to accommodate for new road layouts and increased hardstanding;
- The diversion of gas infrastructure where there will be interfaces with the Proposed Scheme works;
- The diversion of telecommunications infrastructure where there will be interfaces with the Proposed Scheme works; and
- Importation of construction materials including concrete, metals, cement, road surface materials and landscaping materials. The amount of materials required for the Proposed Scheme will represent less than one percent of the Irish quantities manufactured per year.

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 has been accounted for in the overall design of the Proposed Scheme.

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 the pre-construction assessments undertaken and reported in this EIAR.

Consultation has taken place with the major utility companies, and the appointed contractor will continue to consult with these companies, in liaison with the NTA. Where diversions are required and service disruptions to the surrounding properties are unavoidable, this will be planned with prior notification given to the impacted property owners.

The proposed structures and deconstruction works at the mouth of George's Dock and the Royal Canal have been designed to minimise the impact on these features as far as possible. Any disruption to these waterways will be planned in consultation with Waterways Ireland, and all Waterways Ireland requirements will be adhered to during the bridge works.

The Proposed Scheme has also been designed to minimise the amount of major construction works required. When sourcing materials for the Proposed Scheme, the appointed contractor will carefully consider the sustainability of materials. Aspects considered will include the source, the material specification, production and transport costs, and the availability of the material. Construction materials will be managed on-site appropriately to prevent over-ordering and waste.

With the implementation of the proposed mitigation measures there will be no significant residual impacts on material assets as a result of the Proposed Scheme.

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

- The requirement for electricity connections for new lighting, for bus stop information and for junction signalling as well as operation of the Dodder Public Transport Opening Bridge (DPTOB)(via a new sub-station); and
- The requirement for telecommunications connections at bus stops which contain real time passenger information, to allow the buses and the real time information to sync up with each other.

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.

8.15 Risk of Major Accidents and / or Disasters

This assessment considered the potential significant 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 consequence of such incidents in relation to the environmental, social and economic receptors that may be affected.

A register of all potential risks and the associated predicted 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 and / 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 and / 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; however the following medium level risks were identified for the Construction Phase:

- Risk of gas explosion due to striking underground gas mains during excavation works;
- Risk of contact with / damage to pressurised heating district pipes and high pressure gas mains (Liffey Services Tunnel (under the Tom Clarke East Link Bridge) and Services Tunnel (from Ringsend to North Wall Quay));
- Risk of collapse of structures during construction of the Dodder Public Transport Opening Bridge (DPTOB) over the confluence of the River Liffey and River Dodder;
- Risk of pollution event leading to environmental damage to watercourses or groundwater, particularly associated with the potential release of silt to the aquatic environment; and
- Risk of spread of invasive species during construction works, particularly during site preparation and clearance works.

The Proposed Scheme complies with relevant design standards, which include measures to reduce the likelihood of risk events occurring.

Appropriate mitigation measures will be implemented during the Construction Phase, including the implementation of a Construction Environmental Response Plan and an Environmental Incident Response Plan. With the application of these mitigation measures, there are no remaining identified incidents or major accidents

and / or disaster risk events that present a level of risk that would lead to significant impacts or environmental effects.

No significant risks were identified as likely to occur during the Operational Phase.

8.16 Cumulative Impacts and Environmental Interactions

This assessment considers the potential cumulative impacts and impact interactions as a result of potential impacts from other schemes in combination with the predicted impacts of the Proposed Scheme, and interactions between environmental aspects. The assessment included a consideration of the potential effects of other BusConnects Core Bus Corridor Schemes as well as other projects.

Impact interactions between environmental aspects are generally addressed as part of the individual topic assessments, so for example the Population assessment included effects on community amenity, which relates to the interaction of impacts on air quality, visual amenity, traffic and transport, and noise and vibration.

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 and strategic housing developments;
- Local authority websites and the development plans – for details of allocations and areas for regeneration;
- National Planning Application Database – for downloadable list of planning applications sent from Local Authorities;
- NTA's website – for details of major transport programmes. This included a review of the NTA's Transport Strategy for the Greater Dublin Area 2016-2035 and Greater Dublin Area Transport Strategy 2022-2042;
- Project Ireland 2040, which combines the National Development Plan and National Planning Framework. and its interactive mapper;
- Transport Infrastructure Ireland website – for details of major transport programmes;
- The EIA Portal maintained by the Department of Housing, Planning and Local Government – for applications for development consent accompanied by an EIAR; and
- Irish Water's website, which includes a page on its projects.

A combined worst-case scenario was considered, with the simultaneous construction of all the BusConnects Core Bus Corridor Schemes. Traffic modelling of this scenario identified the potential for large cumulative impacts on local road traffic. For this reason, it is not considered feasible or acceptable to construct all 12 schemes at the same time. Consequently, an alternative scenario was developed to identify a more realistic worst-case scenario for the traffic-related cumulative effects assessment. This scenario proposes a limitation on the number of schemes that can be constructed concurrently. This scenario was considered, in combination with the other identified major infrastructure project and major developments which could directly interface with the Proposed Scheme with regard to traffic and transport.

The results of the modelling showed that with the CTMPs for all schemes in place at the same time, there would be significant traffic displacement across the Dublin area. The large cumulative increase of traffic on local roads had the potential to generate a significant adverse impacts of traffic congestion along with the risk of generating air quality and noise impacts. A revised construction scenario was developed which is based on four schemes which cannot be constructed concurrently with adjoining schemes. This scenario was development to minimise potential significant impacts on traffic, air quality and noise.

There is potential for significant in-combination effects on biodiversity due to disturbance and displacement of non-SCI breeding and non-SCI wintering bird species during construction of the Proposed Scheme and other identified major projects, in the event construction periods overlap. However, these effects are predicted to be at a local geographic scale or local-county geographic scale (for a small number of projects).

For the Landscape (Townscape) and Visual assessment, if construction periods overlap / are successive, there remains potential for localised moderate temporary / short-term cumulative effects during construction in the

townscape/streetscape with other projects however, it is likely that the extent of any such impacts will be localised and contained.

The combined impact of the Proposed Scheme with other schemes under construction concurrently is considered to result in a cumulative negative, short-term and significant impact. In general, the carbon emissions associated with embodied carbon and energy to construct schemes on a national basis is accounted for cumulatively as part of the ETS. Impacts on climate associated with the Proposed Scheme cumulatively with the construction of all other Core Bus Corridor schemes are predicted to be negative, significant and short-term.

No other significant construction related cumulative effects were identified from the Proposed Scheme in combination with other projects (including the other Core Bus Corridor Schemes) over and above those identified in the standalone assessments.

For Operational Effects, the assessments assume all 12 proposed Bus Corridor Schemes would be operational, along with other identified projects and Greater Dublin Area Transport Strategy projects included in the Do Minimum and Do Something scenarios. For traffic and transport, the assessment predicted that the Proposed Scheme and the other 11 Core Bus Corridor schemes are expected to facilitate a long term, profound positive cumulative effect on People Movement by sustainable modes. The Core Bus Corridor schemes are seen to enable significant improvements in People Movement by sustainable modes along the direct Core Bus Corridor routes, particularly by bus and cycling, with reductions in car mode share due to the enhanced sustainable mode provision. The Proposed Scheme and the other 11 Core Bus Corridor schemes provide for enhanced integration and efficiencies for all public transport modes by facilitating substantial increases in public transport average network wide travel speeds.

The Core Bus Corridor Infrastructure Works will also support the delivery of government strategies outlined in the 2023 CAP (DCCAE 2022) and the 2021 Climate Act by enabling sustainable mobility and delivering a sustainable transport system. The Core Bus Corridor Infrastructure Works will provide connectivity and integration with other public transport services leading to more people availing of public transport, helping to further reduce GHG emissions.

Based on the analysis outlined above, it is concluded that the Core Bus Corridor Infrastructure Works 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 Core Bus Corridor Infrastructure Works has the potential to reduce GHG emissions equivalent to the removal of approximately 105,500 and 209,100 car trips per weekday from the road network in 2028 and 2043 respectively. This has the effect of a reduction in total vehicle kilometres, a reduction in fuel usage, and increases to sustainable transport trips and modal share in accordance with the 2023 Climate Action Plan (DCCAE 2022). It is concluded that, cumulatively, the Core Bus Corridor Infrastructure Works will make a significant contribution to carbon reduction.

There is potential for positive, very-significant, long-term cumulative effects on human health as a result of the other Core Bus Corridor Schemes. The Core Bus Corridor schemes would be complementary to the Proposed Scheme and offer a greater choice of priority bus routes for bus passengers. It is considered likely that this would encourage greater uptake of bus services among the population surrounding the Proposed Scheme by offering a choice of efficient public transport journeys. This would be beneficial to health by improving wellbeing from greater journey reliability, access to services for those without a car and supporting greater physical activity as a part of an overall journey via public transport.

Similarly, in regard to other proposed Major Projects, it is considered that such proposals and the Proposed Scheme are complementary and could have cumulative beneficial effects by connecting different communities and destinations which would improve general accessibility to areas of leisure and employment which can have positive effects on mental health, which is judged to be Positive and Significant in the Long-term on health

For the Landscape (Townscape) and Visual assessment, the effects of any changes are likely to be reduced over time with establishment of proposed landscape measures but there remains the potential for moderate short-term effects during operation. Medium and long-term effects will be neutralised by general acceptance of the structures into the townscape / riverscape; however, moderate effects are likely to remain for the following projects:

- Major Project (id MP22) - Development of a road link connecting from the southern end of the Dublin Port Tunnel to the South Port area, which will serve the South Port and adjoining development areas; and
- Major Project (id MP36) - Dublin Southern Port Access Route (SPAR)

Significant environmental interactions occur between the topics of population, human health, air quality, noise and vibration and traffic and transport. The assessments made for each of those topics consider those interactions both directly and indirectly. As an environmental factor, landscape and visual considerations have natural relationships with all other environmental factors. Some are direct relationships, e.g., population and visual impacts; biodiversity and landscape; land, soils and water and landscape; or the setting around features of cultural heritage etc. Others may be indirect, e.g. human health, air quality and landscape, material assets and landscape and visual aspects. Wherever possible these potential interactions have been incorporated into the relevant assessments.

In brief, the Proposed Scheme will address sustainable mode transport infrastructure deficits while contributing to an overall integrated sustainable transport system as proposed in the Greater Dublin Area Transport Strategy. It will increase the effectiveness and attractiveness of bus services operating along the corridor and will result in more people availing of public transport due to the faster journey times and reliability improvements which the Proposed Scheme provides. This in turn will support the potential to increase the bus network capacity of services operating along the corridor and thereby further increasing the attractiveness of public transport. In addition to this, the significant segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Scheme will further maximise the movement of people travelling sustainably along the corridor and will therefore cater for higher levels of future population and employment growth.

9. What Happens Next?

The application for consent / approval, this EIAR and the Natura Impact Statement (NIS) may be viewed / downloaded on the following website: https://www.ringsendscheme.ie/.

This application may also be inspected free of charge or purchased on payment of a specified fee (this fee shall not exceed the reasonable cost of making such a copy) for a period of 8 weeks commencing on the date of publication of the Proposed Scheme. Further details of these arrangements can be found at https://www.ringsendscheme.ie/.

Submissions or observations may be made to An Bord Pleanála (Strategic Infrastructure Division), 64 Marlborough Street, Dublin 1, D01 V902 for a period of 8 weeks commencing on the date of publication of the Proposed Scheme relating to:

- The likely effects on the environment of the Proposed Scheme;
- The implications of the Proposed Scheme for proper planning and sustainable development in the area in which it is proposed to situate the Proposed Scheme; and
- The likely adverse effects of the Proposed Scheme on a European Site.

An Bord Pleanála may, in relation to an application submitted for approval under Section 51 of the Roads Act 1993 (as amended), by order, approve the Proposed Scheme, with or without modifications and subject to whatever environmental conditions it considers appropriate, or may refuse to approve the Proposed Scheme.