Non-Technical Summary

Contents

1. Introduction

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the Swords 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 12km and commences south of Swords at Pinnock Hill Junction. The Proposed Scheme travels in a southerly direction along the R132 Swords Road past Airside Retail Park, Dublin Airport and Santry Park. The route continues on the R132 past Santry Demesne, where the Swords Road joins the R104 at Coolock Lane. The route continues on the R132 in a southerly direction through Santry Village. It continues along the Swords Road past Whitehall to Griffith Avenue. The route follows Drumcondra Road Upper past the DCU St Patrick's Campus to the River Tolka. It continues through Drumcondra, on Drumcondra Road Lower, to Binns Bridge on the Royal Canal. From there it continues on Dorset Street Lower as far as Eccles Street, from where it continues on Dorset Street Upper to North Frederick Street and Granby Row.

The route of the Proposed Scheme is presented in Image 1-1, and general arrangement drawings of the Proposed Scheme are appended to this NTS.

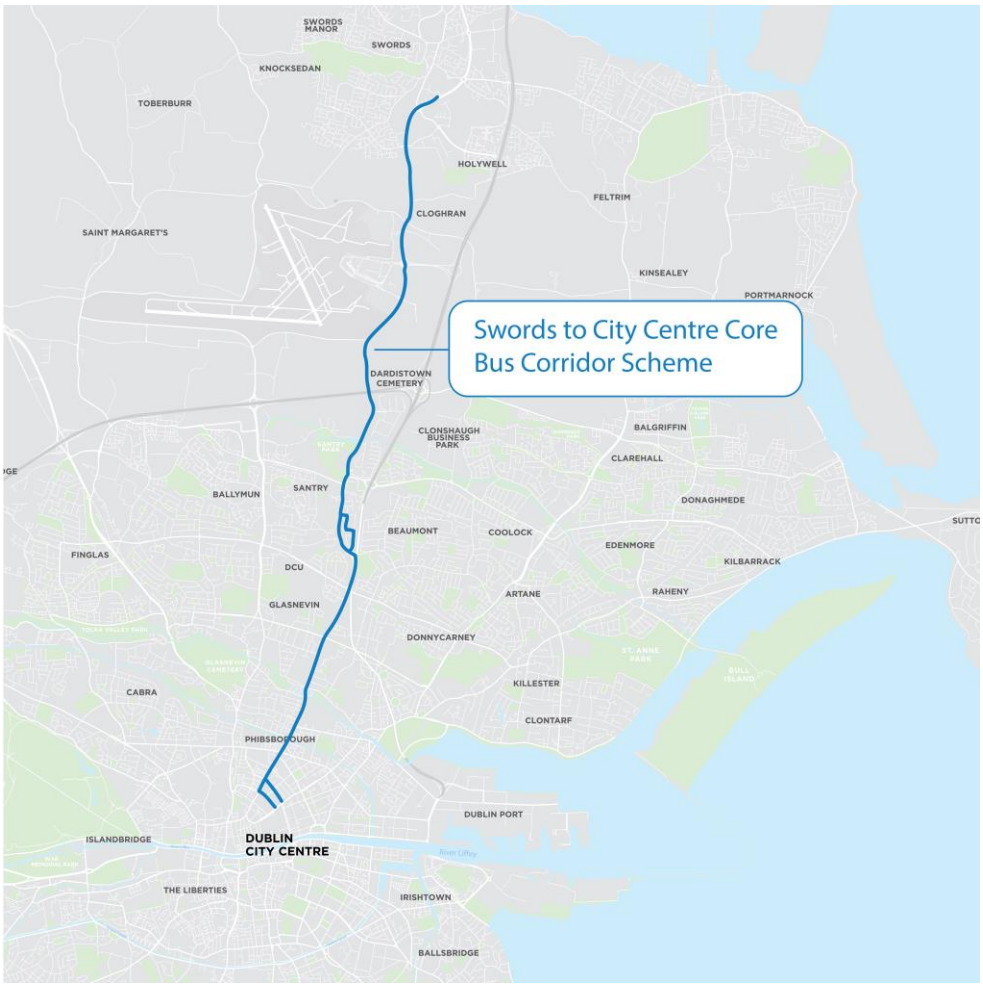

Image 1-1: Route of the Proposed Scheme

The Proposed Scheme would enhance travel by public transport by providing bus priority as well as improved pedestrian and cycling infrastructure from Pinnock Hill to the City Centre. Currently this access corridor is characterised by traffic congestion and while there are existing bus lanes on parts of the route, buses and cyclists are competing for space with general traffic for most of the journey, making it less attractive for pedestrians, cyclists and bus users.

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 time reliability.

In addition to the improvements to bus journey times and journey time reliability, the Proposed Scheme will provide benefits for 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 would deliver substantial elements of the National Transport Authority (NTA) Greater Dublin Area Cycle Network Plan (hereafter referred to as the GDA Cycle Network Plan) (NTA 2013); much of which does not currently have adequate provision - as well as linking with other existing and proposed cycling schemes and sustainable transport modes. This would contribute towards the development of a comprehensive cycling network for Dublin.

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 primary objective of the Proposed Scheme, therefore, is the facilitation of a modal shift from car dependency through the provision of walking, cycle, and bus infrastructure enhancements thereby contributing to an efficient, integrated transport system and facilitate 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 called 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 Transport Strategy for the Greater Dublin Area 2016–2035 (NTA 2016) and the replacement Greater Dublin Area Transport Strategy 2022–2042 (hereafter referred to as the GDA Transport Strategy).

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, with the need for the Proposed Scheme described in detail in Chapter 2 (Need for the Proposed Scheme) of this EIAR.

The outcomes achieved from delivering the Proposed Scheme would 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 modal shift to public transport; 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

The NTA is a statutory non-commercial body, which operates under the aegis of the Department of Transport. The NTA was established on foot of Number 15 of 2008 - Dublin Transport Authority Act 2008 (as amended) (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 construction of 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 potential environmental impacts of the Proposed Scheme;
- Describe environmental issues and any likely significant impacts 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 impacts; 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 2021

The Climate Action Plan 2021 sets out at a National level how Ireland is to halve its emissions by 2030 (51% reduction) and reach net zero no later than 2050. The Climate Action Plan is a road map to delivering Ireland's climate ambition. There are 475 actions identified that extend to all sectors of the economy aiming to transform Ireland into a low carbon nation over the next three decades.

In regard to modal shift the Climate Action Plan 2021 sets out that:

> *'The proposed pathway in transport is focused on accelerating the electrification of road transport, the use of biofuels, and a modal shift to transport modes with lower energy consumption (e.g. public and active transport)'.*

Promoting more sustainable travel modes is seen as critical for climate policy. It offers an opportunity to '*improve our health, boost the quality of our lives, meet the need of our growing urban centres and connects our rural, urban and suburban communities'.*

BusConnects is referenced as a major transport project that will help to deliver the 500,000 additional sustainable journeys. A key goal of the plan is to provide citizens with reliable and realistic sustainable transport options. The Climate Action Plan further states:

> '*The new approach to public transport will be based on a vision of an integrated public transport network, enabling short, medium and long-distance trips for people in every part of Ireland. This will mean increasing the frequency of existing rail and bus services, and expanding the bus network through the Connecting Ireland approach.'*

The Proposed Scheme is needed to support the key actions set out in the Climate Action Plan 2021. At a local level, the Proposed Scheme directly supports the provision of sustainable transport options to meet travel demand. The Proposed Scheme will expand, enhance, and connect to pedestrian and cycle networks and will help to deliver compact growth on zoned development lands close to the Proposed Scheme.

3.4 Climate Action Plan 2023

Climate Action Plan 2023 is the second annual update to Ireland's Climate Action Plan 2019. This plan 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 plan implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve Irelands emissions by 2030 and reach net zero no later than 2050.

Climate Action Plan 2023 calls for a significant cut in transport emissions by 2030 in order to meet the sectoral emission 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 Plan is the advancement of the BusConnects Programme in 5 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 Climate Action Plan 2023 are closely linked to the delivery of key transport infrastructure projects, such as the BusConnects Programme and therefore the Proposed Scheme.

3.5 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 requirements, 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 CO2 emissions within the Greater Dublin Area by 2030.

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

The Transport Strategy considers the road 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 Dublin BusConnects, of which the Proposed Scheme is 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 Transport Strategy 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 Greater Dublin Area Transport Strategy (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 North Dublin area with varying degrees of bus priority linking outer suburbs to the City Centre. These are the Swords to City Centre corridor (The Proposed Scheme) in the centre, the Ballymun/Finglas to City Centre corridor to the west and the Clongriffin to City Centre corridor to the east.

The Core Bus Network study included a recommended route from Swords 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 Dublin Bus Connects 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 Transport Strategy 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 maximize 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, provided 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 Transport Strategy 2022 - 2042 and 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 and is 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 strong 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 14 November 2018 to 29 March 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 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 Community Forum was 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 30 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 further planned events scheduled after 12 March 2020 were postponed. In deference to the submissions which had already been received, the decision was made not to cancel the consultation.

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 certain 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, Fingal Dublin County Council, Inland Fisheries Ireland and the Heritage Council) 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 2018 through to the Autumn of 2021. This engagement has overlapped with the public consultations (in November 2018 to March 2019, March 2020 and November 2020). Over the course of the engagements, affected property owners have had the opportunity to discuss different aspects of the Proposed Scheme with the design team.

Most recently during October and November 2022 letters have been issued to properties likely to be the subject of the Proposed Scheme Compulsory Purchase Order process seeking to engage with them to ascertain ownership details. In addition, on 3 March 2023, letter drops occurred to properties that did not respond to the initial registered letters. Follow-up conversations have been facilitated as a result of these letters on request.

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 2018, the NTA facilitated consultation on request with small 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 GDA Transport Strategy 2016 - 2035, and its associated Strategic Environmental Assessment, considered several strategic options relevant to the Proposed Scheme. The Transport Strategy for the Greater Dublin Area 2022-2042 (Transport Strategy) replaces the prior transport strategy for the period 2016 to 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 GDA 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 GDA up to 2035 in the GDA Transport Strategy 2016 - 2035.

The Proposed Scheme is located in Corridor A in the GDA Transport Strategy 2016 - 2035 which extends from the core City Centre area through, Drumcondra, Whitehall, Santry, Dublin Airport and north towards Swords and contains areas of further residential growth in the Fosterstown area and Swords.

Through the work undertaken in the preparation of the GDA Transport Strategy, 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 GDA Transport Strategy 2016 – 2035 has concluded that new heavy rail and light rail/metro alternatives would not be justified in addition to the proposed Metro project by the predicted level of demand. The challenges outlined in the GDA Transport Strategy 2016 - 2035 identified need for BusConnects Dublin as determined in the preparation of that prior strategy remain, 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.

Accordingly, it is intended that all of the Core Bus Corridor Infrastructure Works, including the Proposed Scheme, will be developed to provide a BRT level of service, rather than establishing a separate mode on some corridors.

Consequently, the Proposed Scheme as a separate BRT mode was not progressed given the limited differentiation from the Core Bus Corridors and the advantages identified above of a unified integrated bus system.

It was concluded that a bus-based transport system would be the proposed public transport solution in the corridor of the Proposed Scheme. The proposed transport solution would be supplemented by Metro, to provide more passenger capacity and enhanced interchange between the Luas Red and Green Line Services, proposed Metrolink Station at Fosterstown, Sligo/Maynooth Line Heavy Rail Services at Drumcondra Station and the Suburban Interchange between the Orbital and Radial Routes at Coolock Lane. It was considered that there would be insufficient demand to justify the provision of an additional light rail alternative above what is proposed above, particularly given the low to medium density nature of development in this corridor.

5.2 Route Alternatives

Alternative route options have been extensively considered 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) **Feasibility and Options Report,** in early 2016, the NTA initiated plans to develop the network of CBCs identified in the GDA Transport Strategy. As part of this body of work, the 'Swords Core Bus Corridor Feasibility and Options Assessment Report' (February 2018) was prepared which identified feasible options along the corridor, assessed these options and arrived at an Emerging Preferred Route;
2) A first round of non-statutory **Public Consultation** was undertaken on the Emerging Preferred Route from November 2018 to May 2019.
3) Development of **Draft Preferred Route Option** (May 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 4 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 initial route alternatives considered covered a network of roads between Swords and the City Centre. These were narrowed down using a high-level qualitative method based on professional judgement and a general appreciation for existing physical conditions / constraints including environmental considerations within the study area.

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

- Economy;
- Safety;
- Integration;
- Accessibility and 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 EPR was identified. That EPR is summarised as follows:

> *'Describing from north to south, the emerging preferred route starts on the R132 at the Pinnock Hill junction and continues along this road passing Airside and onwards to the Airport. At the Airport, the CBC would stay on the R132 past the airport (it is noted that bus services will continue to serve the Airport terminals directly). From the airport, the preferred route follows the R132 towards Santry where the route passes through Santry Village. To the south of Santry, the route turns off Shantalla Road onto the R132 and onwards to Collins Avenue junction close to Dublin City University.The route continues along the R132 Swords Road passing Griffith Avenue, DCU St. Patricks College, Drumcondra Village and Drumcondra rail station.South of the Royal Canal, the emerging preferred route continues southwards along Dorset Street. From Dorset Street, the preferred route turns onto North Frederick Street and continues onto Parnell Square East'.*

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 in submissions, including incorporating suggestions and recommendations from local residents, community groups and stakeholders, and/or arising from the availability of additional information. These amendments were incorporated into the designs and informed a Draft Preferred Route Option. Alternatives considered during the development of the Draft Preferred Route Option included the following:

- To reduce the impact to access/egress through the Santry Village Section of the Proposed Scheme, further design development and assessment work identified an alternative arrangement for bus provision and cycling through Santry Village. A two-way traffic option was preferred with the cycle route redirecting cyclists through Lorcan Road and Shanrath Road where a quiet street environment could be implemented. This alternative cycle route commences at the junction with Omni Park Shopping Centre and connects with the Swords Road at the junction with Shantalla Road. Signal-controlled bus priority, whereby only one bus lane is provided, was also considered as an option through Santry Village, in order to reduce the impact on land take. For signal-controlled bus priority to operate successfully, queue lengths from the next junction cannot be allowed to develop on the shared bus/traffic lane portion, as this would result in delays to the bus service. Junction modelling of this option through Santry Village showed extensive queuing at the Lorcan Road/Omni Park Shopping Centre, Shanowen Road and Shanrath Road junctions, which are in close proximity to each other (300m between the Lorcan Road/Omni Park and Shanowen Road junctions and 250m between the Shanowen Road and Shanrath Road junctions). On this basis, signal-controlled bus priority was discounted as a feasible option through Santry Village.
- The cross section between Northwood Avenue and Coolock Lane in the Emerging Preferred Route incorporated footpaths, cycle lanes, bus lanes and traffic lanes in each direction. As the cross section of the R132 from Morton Stadium as far as Coolock Lane is at most 3 lanes wide at present (2 lanes southbound, 1 lane northbound), encroachment into Santry Demesne and private properties on the opposite side of the road was required, along with removal of much of the Santry Demesne wall as far as the Coolock Lane junction. Following development of a traffic local area model it was ascertained that, given the distance between the Northwood Avenue and Coolock Lane junctions, queueing traffic in each direction at those junctions was unlikely to extend as far as the proposed midpoint pedestrian crossing at the main entrance to Morton Stadium. Accordingly, it was concluded that the bus lane from each junction to this midpoint pedestrian crossing could be replaced by signal-controlled bus priority, whereby buses are given priority over general traffic exiting the junctions until the bus lane resumes at the midpoint pedestrian crossing. Based on a multi-criterion assessment, the wall was retained and no direct impact would occur on the Santry Demesne pNHA.
- The existing road layout on the Tolka River bridge consists of two traffic lanes each way, widening out to include a separate right turn lane at the approaches to Richmond Road and Botanic Avenue. The Emerging Preferred Route which was issued as part of the first Public Consultation required widening of the bridge to the west of the structure to accommodate the CBC Infrastructure Works. During further design development the records of the existing services in the footpath and attached

to the west side of the structure were obtained and assessed. It was concluded that the existing services could not be adequately accommodated in a cantilevered structure. A number of road layout options were considered in order to avoid the necessity to widen the bridge. As a result of the update assessment work, an independent structure, separate from the existing bridge was presented in the updated Draft Preferred Route.

- Under the Emerging Preferred Route Option, it was proposed to apply a left-turn ban onto Gardiner Street Upper from Dorset Street Lower, rendering Gardiner Street Upper one-way to vehicular traffic between Dorset Street Lower and Mountjoy Square North. In addition, much of the existing on-street parking on Gardiner Street Upper and Lower was to be removed and the junction between Gardiner Place and Gardiner Street Upper was to be upgraded to a fully signalised junction with new pedestrian facilities. The Emerging Preferred Route Option required alternative traffic routes to utilise Belvedere Road, Belvedere Place, Mountjoy Square North and Sherrard Street. Under the Revised Bus Network published by the NTA in 2019, high frequency services (A-Spine) were removed from Gardiner Street and it was considered that introduction of two bus lanes over the full length of Gardiner Street was no longer necessary. Consequently changes to Gardiner Street and Mountjoy Square did not form part of the Draft Preferred Route Option.
- There are presently two general traffic lanes in each direction along Drumcondra Road Lower and Dorset Street Lower between Clonliffe Road and Eccles Street/Hardwicke Place. A two metre wide, tree-lined central reserve separates inbound and outbound traffic between St Anne's Road and Eccles Street/Hardwicke Place. Under the Emerging Preferred Route presented in the first Non-Statutory Public Consultation, continuous bus lanes and cycle lane/tracks were to be accommodated in each direction by the removal of one inbound and one outbound general traffic lane. The Emerging Preferred Route layout required removal of the tree-lined central reserve between Whitworth Road/Whitworth Place and Belvedere Road/Innisfallen. This was necessary to introduce bus and cycle provision in each direction, while accommodating the volume of left-turn movements onto Whitworth Road and Belvedere Road. The central reserve was also proposed to be removed between Gardiner Street Upper/Synott Place and Hardwicke Place/Eccles Street. Following receipt of submissions from the first non-statutory public consultation and assessment of full topographical survey information, removal of the central reserve in order to accommodate the cycle tracks and widen the footpaths on either side was considered. The topographical survey allowed more detailed design of the corridor to be undertaken for development of the Draft Preferred Route Option. With the removal of one traffic lane in each direction between Clonliffe Road and Eccles Street, adequate space was available to meet the BusConnects desirable minimum requirements for 3m wide bus lanes, minimum 2m wide footpaths and fully segregated, 2m wide cycle tracks, without the necessity to remove the tree-lined central reserve between Gardiner Street Upper/Synott Place and Hardwicke Place/Eccles Street. In line with the government's Climate Action Plan, reducing the construction carbon footprint has been a key consideration in the layout development of the Proposed Scheme. The removal of the existing tree-lined central reserve along Dorset Street Lower (involving trees and paving that would otherwise be unaffected by the works) was considered unnecessarily disruptive and undesirable.

A number of changes to the design were made based on feedback received during the public consultation and dialogue with stakeholders. These changes encompassed, changes to junction design, locations of bus stops, access arrangements for private and commercial properties and are documented in the Preferred Route Option Report.

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 12km and commences south of Swords at Pinnock Hill Junction and travels in a southerly direction along the R132 Swords Road past Airside Retail Park, Dublin Airport and Santry Park. The route continues on the R132 past Santry Demesne, where the Swords Road joins the R104 at Coolock Lane. The route continues on the R132 in a southerly direction through Santry Village. It continues along the Swords Road past Whitehall to Griffith Avenue. The route follows Drumcondra Road Upper past the Dublin City University St Patrick's Campus to the River Tolka. It continues through Drumcondra, on Drumcondra Road Lower to Binns Bridge on the Royal Canal. From there it continues on Dorset Street Lower as far as Eccles Street, from where it continues on Dorset Street Upper to North Frederick Street and Granby Row.

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, described in Chapter 1 (Introduction & Environmental Impact Assessment Process), 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.

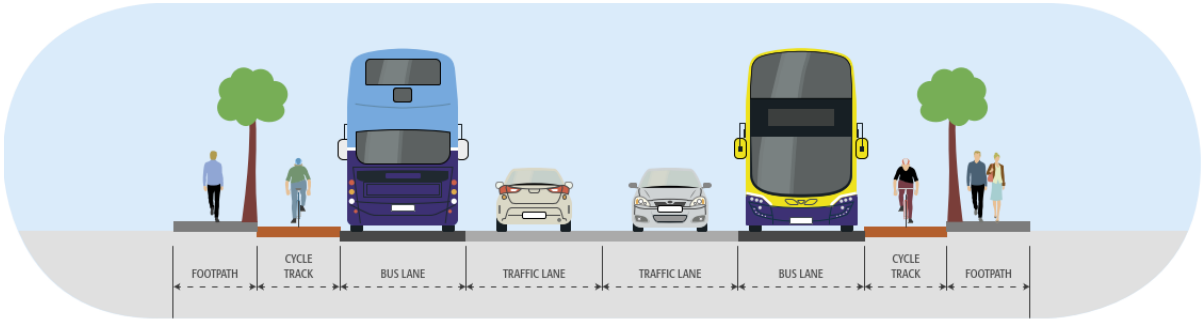

Image 6-1: Typical BusConnects Road Layout

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 31% from 86 to 125 as a result of the Proposed Scheme;
- The proportion of segregated cycle facilities will increase from 28% on the existing corridor to 89% on the Proposed Scheme;
- The proportion of the route having bus priority measures will increase from 72% on the existing corridor to 100% (both directions) on the Proposed Scheme.

The Proposed Scheme is described in the following geographical sections:

- Section 1: Pinnock Hill Junction to Airside Junction;
- Section 2: Airside Junction to Northwood Avenue;
- Section 3: Northwood Avenue to Shantalla Road;
- Section 4: Shantalla Road to Botanic Avenue; and
- Section 5: Botanic Avenue to Granby Row.

6.1 Section 1: Pinnock Hill to Airside Junction

The Proposed Scheme commences south of Swords on the R132 Swords Road at Pinnock Hill. The existing roundabout at Pinnock Hill will be modified to a fully signalised junction with pedestrian and cyclist facilities. New access arrangements are proposed at Swords Veterinary Hospital and a residential property, while the proposed fully signalised junction has been designed to integrate with the aspirations of the Fosterstown Local Area Plan which recognises the requirement for the provision of the Fosterstown Link Road.

Between the Pinnock Hill and Airside junctions, the existing bus lanes will be maintained, the existing footpath will be upgraded, and segregated cycle lanes provided.

This design creates more space for landscaped areas at the edges, especially towards the Swords entrance and facilitates a gateway area to be created with the relocated sculpture to be placed on a plinth and a new and enhanced 'Welcome to Swords' sign. These landscaped areas would feature block planting of varied heights and seasonal planting or wildflower meadows. Clumps of trees reflecting woodland planting are proposed where highway visibility splays and utilities allow. The footways and cycle ways are in asphalt with concrete kerbs to match existing (Image 6-2).

The eastern arm of the R132, which is designed by external parties, is proposed to have a grass verge median or planting to enhance the area.

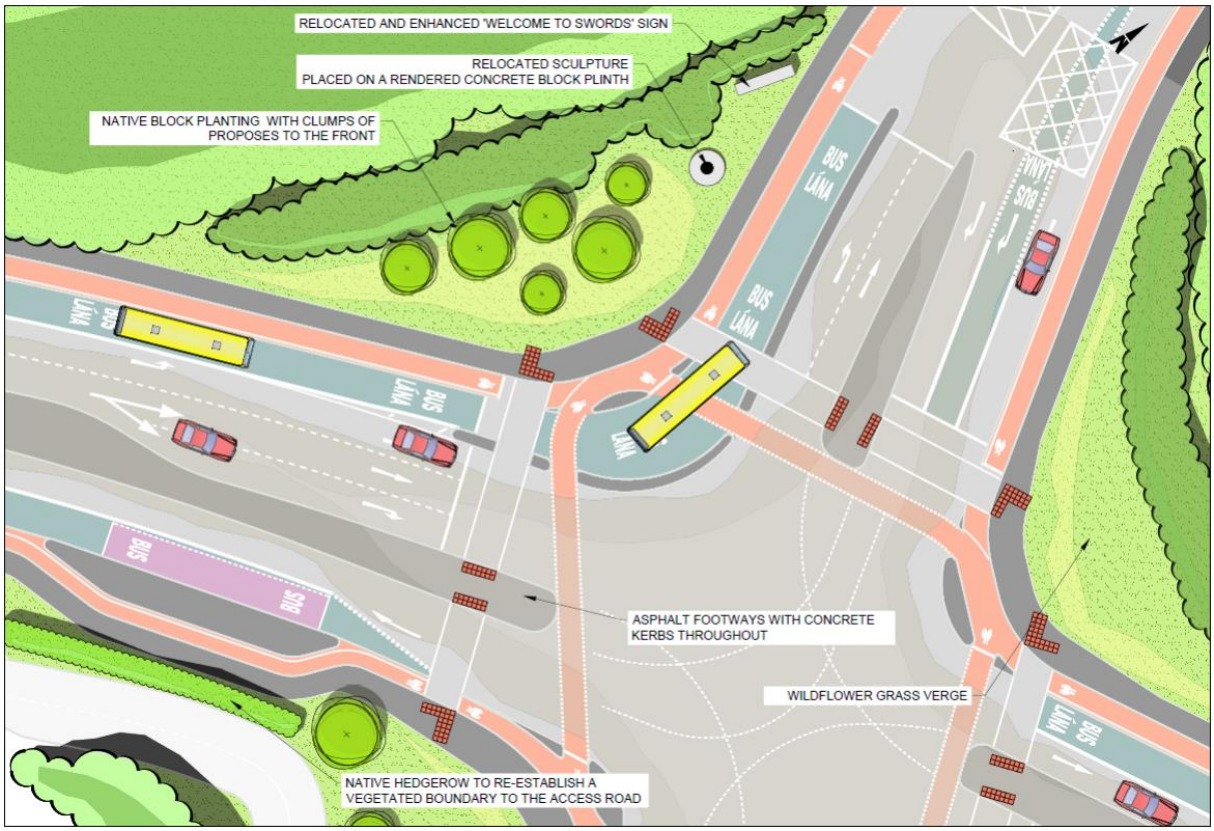

Image 6-2: Pinnock Hill Junction Indicative Design

Temporary land acquisition is required within this Section at various locations to facilitate works, including drainage connections and reconfiguration of access, footpaths and cycle tracks. All temporary land acquisition is to be reinstated once works are completed.

Permanent land acquisition is also required within this Section in order to allow for cross-section widening. There are also areas to be acquired permanently for the installation of new access arrangements at Swords Veterinary

Hospital. To accommodate this improved infrastructure, it will be necessary to acquire limited land take at the following locations:

- Swords Veterinary Hospital;
- Land adjacent to the existing bus stop 3695;
- Development Property to the north of Boroimhe Road; and
- Airside Retail Park, Swords

6.2 Section 2: Airside Junction to Northwood Avenue

Between the Airside and Cloghran Junctions, the existing bus lanes will be maintained, the existing footpaths will be upgraded and extended, and segregated cycle tracks provided. The junction of the R132 with Kettles Lane will be modified to a fully signalised junction, permitting right turn movements. The existing Cloghran roundabout will be modified to a fully signalised junction with pedestrian and cyclist facilities. South of the Cloghran junction, current provision for cars and buses northbound will remain and a new bus lane provided southbound. Segregated one-way cycle facilities are provided on both sides of the R132. Southbound cyclists cross the R132 at the Coachman's Inn to a two-way cycle track on the western side of the R132.

It is proposed to maintain the Airport Roundabout as a signalised junction with some amendments. To provide bus priority southbound through the Airport junction, it is proposed to provide a new signal-controlled priority on the northern approach to the roundabout. The cycle facilities through the Airport junction will be upgraded and cyclists will be accommodated in a two-way cycle track on the western side of the junction, crossing the airport access road via a signalised toucan crossing.

South of the Airport Roundabout the existing northbound shared cycle lane and pedestrian lane is converted to a dedicated footpath and two-way cycle track as far as the South Corballis Road and from this point the cyclists will cross the R132 to return to the eastern side of the road.

Between Collinstown Cross Industrial Estate and Northwood Avenue, improved cycle facilities will be provided. Localised footpath and cycle track narrowing is required to mitigate land acquisition at the Thatch Cottage, which is a protected structure.

The existing signalised junctions of the Swords Road with Old Airport Road, Turnapin Lane and Northwood Avenue are proposed to be upgraded to provide improved infrastructure for pedestrians and cyclists.

No Signal Controlled Priority is used in Section 2. Most of the proposed bus stops within this section of the Proposed Scheme are Island Bus Stops. There will be changes to parking and loading throughout Section 2, namely; the Coachman's Inn, Paddy Shanahan Cars and Swords Road/Schoolhouse lane.

Temporary land acquisition is required within this Section at various locations to facilitate works, including drainage connections and reconfiguration of access, footpaths and cycle tracks. All temporary land acquisition is to be reinstated once works are completed.

Permanent land acquisition is also required within this Section in order to allow for cross-section widening. To accommodate this improved infrastructure, it will be necessary to acquire limited land take at the following locations:

- Hollytree House;
- Airside Texaco Garage;
- Nevinstown Lane;
- Kilronan Equestrian Centre;
- Parfit – The Old School House;
- Dublin Airport Authority;
- The Coachman's Inn;
- McMonagle Stone;

- Dardistown Cemetery and Crematorium;
- Collinstown Cross Industrial Estate;
- The Thatch Cottage, Dardistown;
- J.J. Gillan and Co. Ltd, Old Airport Road;
- Paddy Shanahan Cars, Old Airport Road;
- Quick Park;
- Dardistown House;
- Derryloam, Swords Road;
- Carlton Hotel, Swords Road;
- Value Van Rental, Old Airport Road;
- Carey House, Swords Road;
- Lima House, Swords Road;
- RCSI Sports Ground;
- Collinstown Lodge;
- Whitehall GAA Sports Ground;
- Annesley Williams;
- North Ring Business Park;
- Airways Industrial Estate;
- Woodford Business Park;
- Furry Park Industrial Estate;
- Airport Business Campus; and
- Little Venice.

6.3 Section 3: Northwood Avenue to Shantalla Road

Signal Controlled Bus Priority as well as localised narrowing of the cycle track will be provided between Northwood Avenue and Coolock Lane to mitigate impact on properties and the Santry Demesne historical wall and proposed National Heritage Area. A new bus terminus will be provided in the green space opposite the group of retail premises at the junction of the Swords Road and Coolock Lane.

Between Coolock Lane and the entrance to Omni Park Shopping Centre, it is proposed to extend continuous bus lanes and cycle tracks in both directions. This will require some limited land take from adjacent properties on both sides of the existing road and the removal of existing on-street car parking.

Between the Omni Park Shopping Centre entrance and the Shantalla Road junction it is proposed to maintain the two-way general traffic lanes and introduce continuous bus lanes in both directions. A segregated footpath will be maintained on either side. This will require some land take from adjacent properties on both sides of the existing road in Santry Village and the removal of existing on-street car parking. Off street parking is proposed at residential properties between the shopping centre and Shanowen Road to offset the loss of on-street parking.

It is proposed to redirect cyclists through Lorcan Road and Shanrath Road as a Quiet Street. This cycle route commences at the junction with Omni Park Shopping Centre and connects with the Swords Road at the junction with Shantalla Road. A two-way cycle track is proposed to connect the Quiet Street from Shanrath Road through the Shanrath junction, connecting to the existing Quiet Street west of the off-slip.

A dedicated bus lane is proposed inbound along the Shantalla Road Bridge and a general traffic lane is maintained in both directions. The Shantalla Road junction will be upgraded to accommodate the bus lane and cycle and pedestrian movements.

The design proposes concrete paving slabs with concrete kerbs from the Santry River threshold to Shanrath Road – Larkhill Road junction. The entrance to Santry Park is proposed to be enhanced with granite setts and all the islands enhanced with concrete setts to improve overall image of the area. The existing trees in the park are

retained with proposed new tree planting to be discussed with Local Authorities and stakeholders. The wall along the park south of the junction to be reinstated to match existing. A low stone wall and railings along the south-eastern side of the junction is to be reinstated to suit the realignment and materials are to match the existing (Image 6-3).

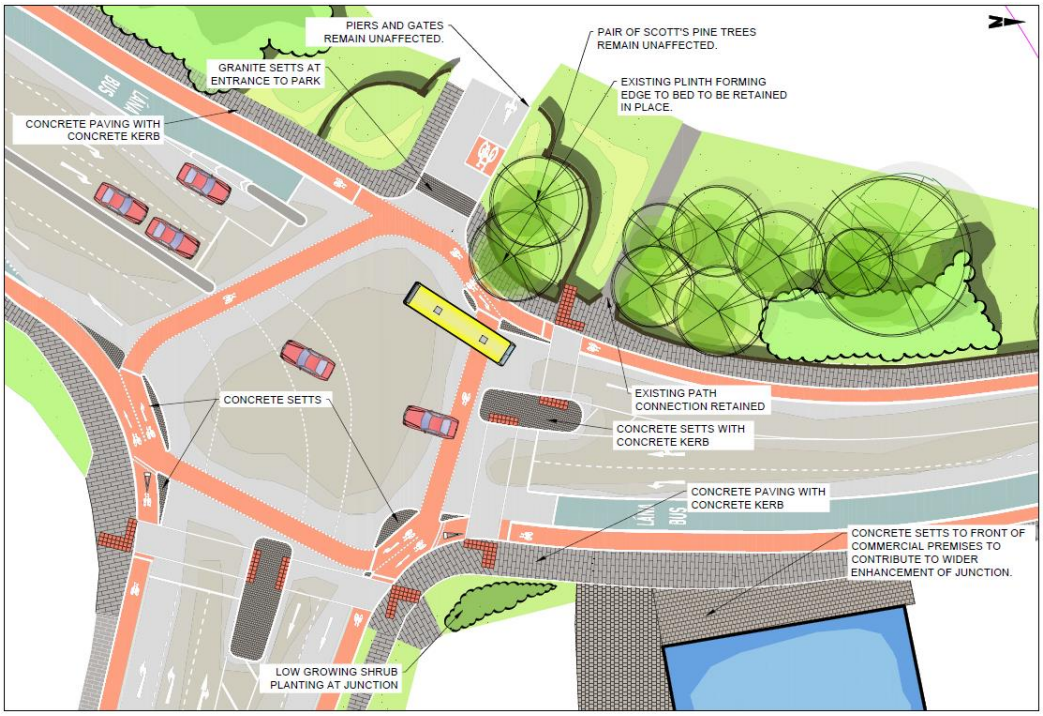

Image 6-3 : Coolock Lane and Entrance to Santry Park Indicative Design

The urban realm of the shopping parade opposite Heiton Buckley is proposed to be enhanced with concrete paving and concrete kerbs to improve the street scene.

The Swiss Cottage interface boundary is to be designed in discussion with landowner in line with new development at future design stages.

South of Swiss Cottage redevelopment site, the boundary proposal is for a low wall with railings at the Trade Electric Group building along the eastern edge and a rendered wall with railing along the western edge, reinstated to match the existing style.

Along the Magenta Hall residential area, along both the western and eastern edges, the design proposes to replace multiple fence types with a unified design to provide a more consistent style to the street in this area. Along the residential edge it is proposed to reposition the newly planted trees and replace the ornamental or seasonal planting as required. The proposed fence design is to consider views from the residential area in order to screen the road. The current fence along Santry Hall Industrial Estate is proposed to be replaced with a fence that complements the residential fence style in order to provide a unified street scene.

The park entrance at the north-eastern corner of Lorcan Road is to be reinstated using concrete slab paving and concrete kerbs. The existing asphalt ramp within the park is to be extended and realigned. New stepped feature planting is incorporated to highlight this park corner along with new park trees as replacements for local tree losses and seasonal planting in a wave form to replace affected planting. The 'Magenta Hall' sign is re-positioned, and an advisory sign is to be located for the Quiet Street Treatment along Lorcan Road (Image 6-4).

Image 6-4: North-Eastern Corner of Lorcan Road Indicative Design

Footways are to be resurfaced with concrete paving slabs and concrete kerbs to enhance the street scene along this residential and mixed-use area.

The design between the Omni Park to Shantalla Road proposes enhancing the footways with concrete paving slabs and concrete kerbs with new driveways to be detailed in concrete setts to enhance the overall street scene. Where boundaries are affected, front gardens are to be restored as needed in consultation with the landowners. Some properties are to incorporate new parking provision within front gardens (Image 6-5).

Image 6-5: Sketch View of New Property Boundaries Along Swords Road

The area in front of The Comet and the retail area on the eastern side of the route is proposed to have surface treatment enhancements. This includes a wider pedestrian footway in concrete paving and the vehicular forecourt in concrete setts. The pedestrian footway along the western retail area near the Comet is also proposed to be enhanced with concrete paving and the parking area in concrete setts along with a replacement low rendered wall off-white or cream to match the residential walls. The Centra forecourt proposes to be de-cluttered and reorganised. The footways along these retail areas to be resurfaced in concrete paving slabs and concrete kerbs to match the rest of the residential footways to the northern part of this section (Image 6-6).

Image 6-6: Sketch View Looking Towards The Comet

The eastern corner of the Shanrath Road-Larkhill Road junction has been identified as a cycle route with cycle tracks through the green space. The proposed design includes crown lifting of existing trees, feature concrete paving in the widened footway with seating and lighting along cycle lanes (Image 6-7).

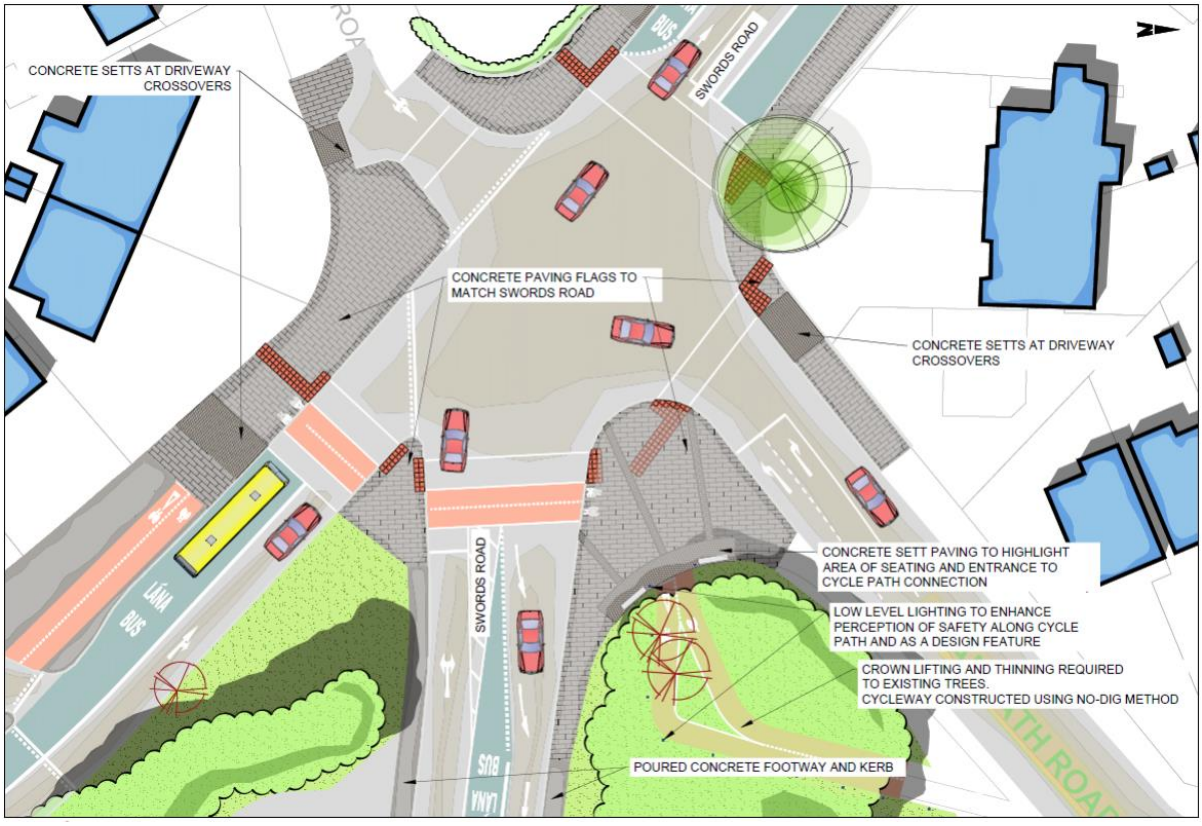

Image 6-7: Eastern Corner of the Shanrath Road-Larkhill Road Junction Indicative Design

Temporary land acquisition is required within this Section at various locations. To facilitate works, including drainage connections and reconfiguration of access, footpaths and cycle tracks. All temporary land acquisition is to be reinstated once works are completed.

Permanent land acquisition is also required within this Section in order to allow for cross-section widening at all of the locations listed above.

To facilitate these transport infrastructure improvements, it will be necessary to acquire limited land take at the following locations:

- Morton Stadium;
- Santry Villas;
- Santry Park;
- Airvista Office Park;
- T O'Reilly Building;
- Swiss Cottage;
- AIB, Swords Road;
- 1 Magenta Crescent;
- Magenta Hall;
- Santry Hall Industrial Estate; and
- Approximately 63 residential properties along Swords Road.

6.4 Section 4: Shantalla Road to Botanic Avenue

From Shantalla Road to the Botanic Avenue, a continuous bus lane will be provided in both directions. It is proposed to retain the existing bus lanes and provide a segregated cycle track and footpath between Shantalla Road and Milmount Avenue in both directions. Between Shantalla Road and Collins Avenue the main north/south cycle route and pedestrian route will continue via a Quiet Street Treatment along the Swords Road. An additional south bound segregated cycle track will be provided adjacent to the south bound slip lane of the Shantalla Road junction. A short section of this cycle track is reduced to 1.5m wide in front of the Church of the Holy Child in addition to a reduction of the existing 3.5m wide footpath to 2m wide.

Localised narrowing of the cycle track is also required at Plunket College and Highfield Hospital to avoid land take and impacting a row of high-quality trees along the boundary of Plunket College. Narrowing is also required outbound along Drumcondra Road Upper between St Patrick's College and Griffith Avenue, where providing a standard width would result in significant loss of mature trees.

It is proposed to upgrade the Collins Avenue junction to better facilitate bus priority and provide dedicated, segregated bus lanes to the stop lines with signal-controlled priority. The other key junctions, at Griffith Avenue, Richmond Road/Millmount Avenue and Botanic Avenue, will be upgraded to improve cyclist provision and bring bus lanes closer to the stop lines.

In Drumcondra, an independent pedestrian and cycle bridge over the River Tolka is being provided as part of the Proposed Scheme to allow the proposed bus lanes to be accommodated over the existing bridge. The proposed bridge would require the removal of two Poplar trees within Our Lady's Park while four new smaller-sized trees have been proposed surrounding the square paved area, subject to underground utilities. Three new small canopy trees are proposed at the west end of the bridge adjacent to Millmount Terrace. The existing square area of paving surrounding the statue on the south side of the river will be replaced and enhanced with a combination of stone and concrete paving together with new seating as a local area enhancement. The path close to the river will be re-aligned and re-surfaced to meet with the new paved square. Additional planting is to be provided on the eastern side of the path to prevent access to the narrow embankments leading to the river side beneath the structure.

The shopping parade near Iveragh Road has been identified as a local enhancement to improve the setting and appearance of the local shops. Concrete paving slabs and concrete kerbs are proposed for footways and concrete setts for the parking areas. The bus stop area is enhanced with a widened area for pedestrians and shop fronts. Pedestrian crossings are improved as part of the re-aligned junction along with a continuous cycle track to both sides (Image 6-8).

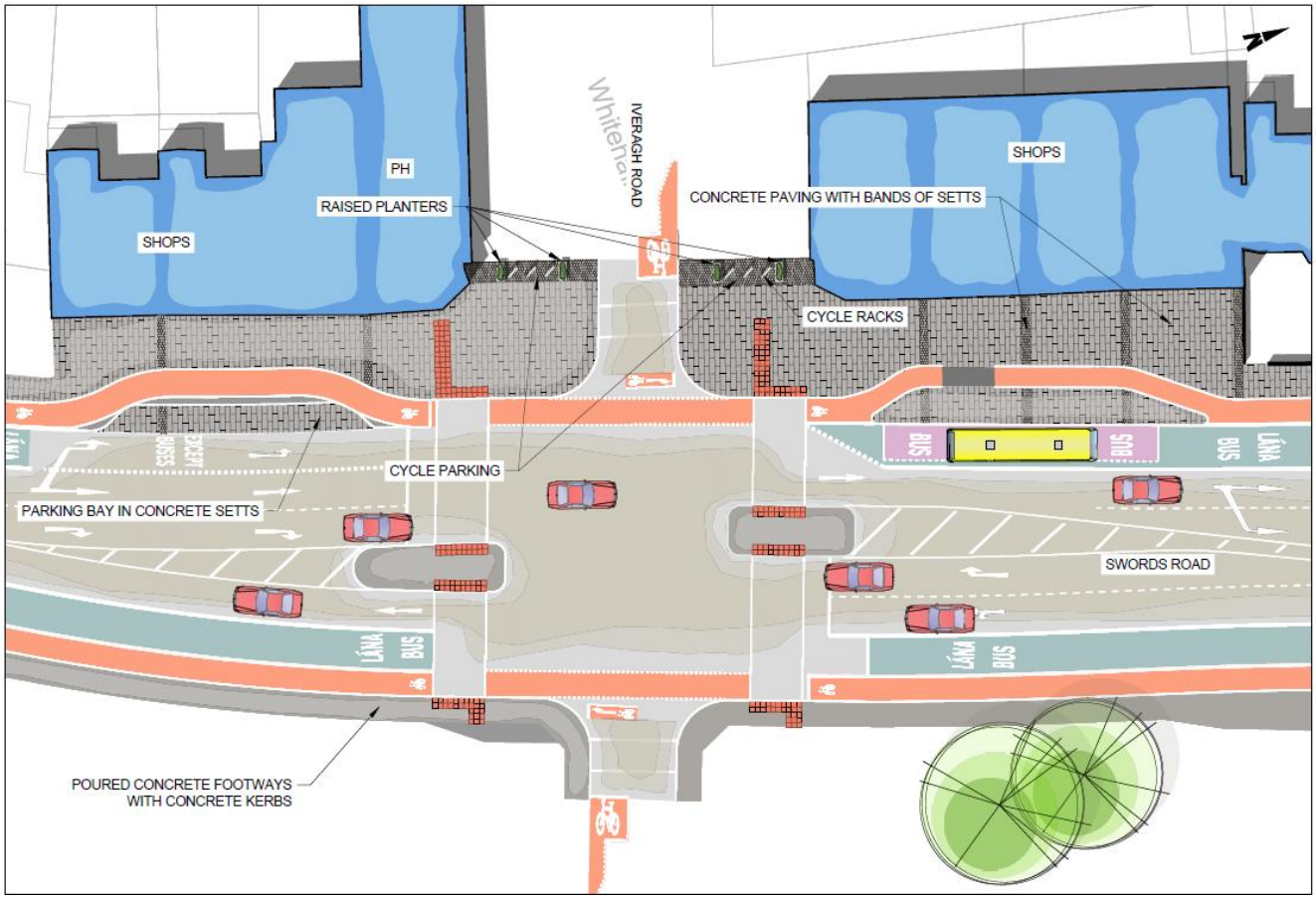

Image 6-8: The Shopping Parade Near Iveragh Road Indicative Design

The DCU area is proposed as a local area of enhancement with the proposed design including high-quality grey concrete slabs interspaced with darker grey linear bands of paving that continue along the DCU boundary to the west for visual continuity. Granite kerbs are proposed along this area utilising existing granite kerbs where possible. A general declutter and unified street furniture use is proposed for this area. Parking bays are proposed to be finished in concrete setts to visually integrate with pedestrian areas, or as inset parking bays at footway level to provide wider footways when not in use. The private forecourts have the potential to be repaved in concrete block paving in consultation with landowners. Edge kerbs are proposed to mark the boundary of private forecourts. The commemorative flower post features are to be retained or relocated in consultation with Local Authorities (Image 6-9).

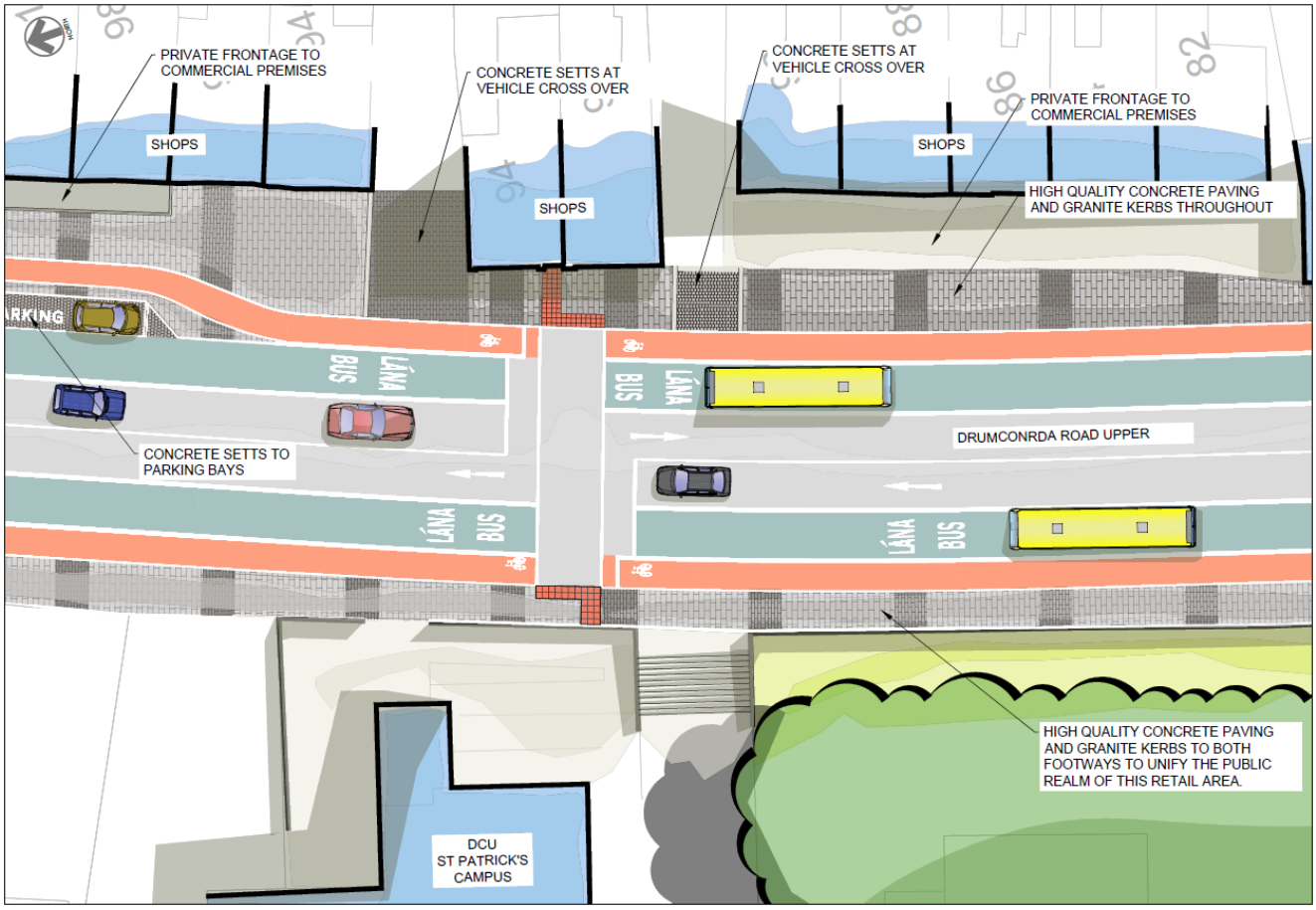

Image 6-9: DCU Area Indicative Design

The footway in front of Cat and Cage pub to be finished in concrete paving slabs and granite kerbs. The banding feature starts at the edge of the pub. The pedestrian crossing at the side street is finished in concrete setts to enhance pedestrian priority. The residential area footways are to feature concrete paving slabs and granite kerbs of the same type as the retail area but without the banding feature (Image 6-10).

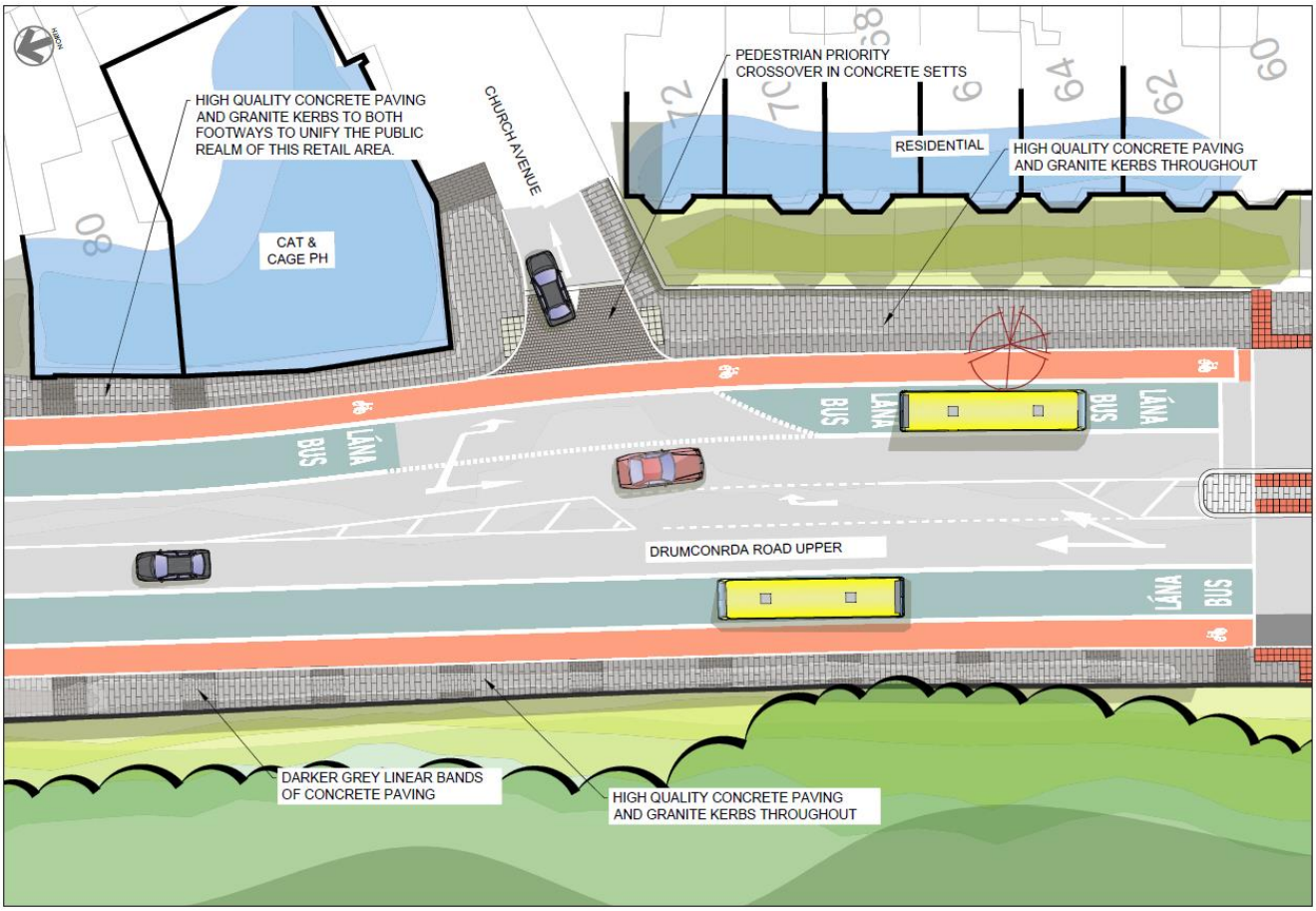

Image 6-10: Footways in the Vicinity of the Cat and Cage Pub Indicative Design

The Drumcondra Road Upper shopping parade is also identified as a local enhancement opportunity to improve the image of the urban realm. The design proposed is to reflect the same design style and materials as the DCU area in order to make the two retail areas visually unified. The design includes footway enhancements with high-quality grey concrete slabs interspaced with darker grey linear paving units as feature bands. Granite kerbs are proposed along this area reusing exiting granite kerbs where possible. The refreshed paving and banding are proposed in the private forecourt areas up to the edge of the shops but will need to be agreed with landowners. Parking bays are proposed to be finished in concrete setts to visually integrate with adjacent pedestrian areas or as inset parking bays at footway level to provide wider footways when not in use. The commemorative flower post features are to be retained or relocated within the darker banding feature paving in consultation with Local Authorities (Image 6-11).

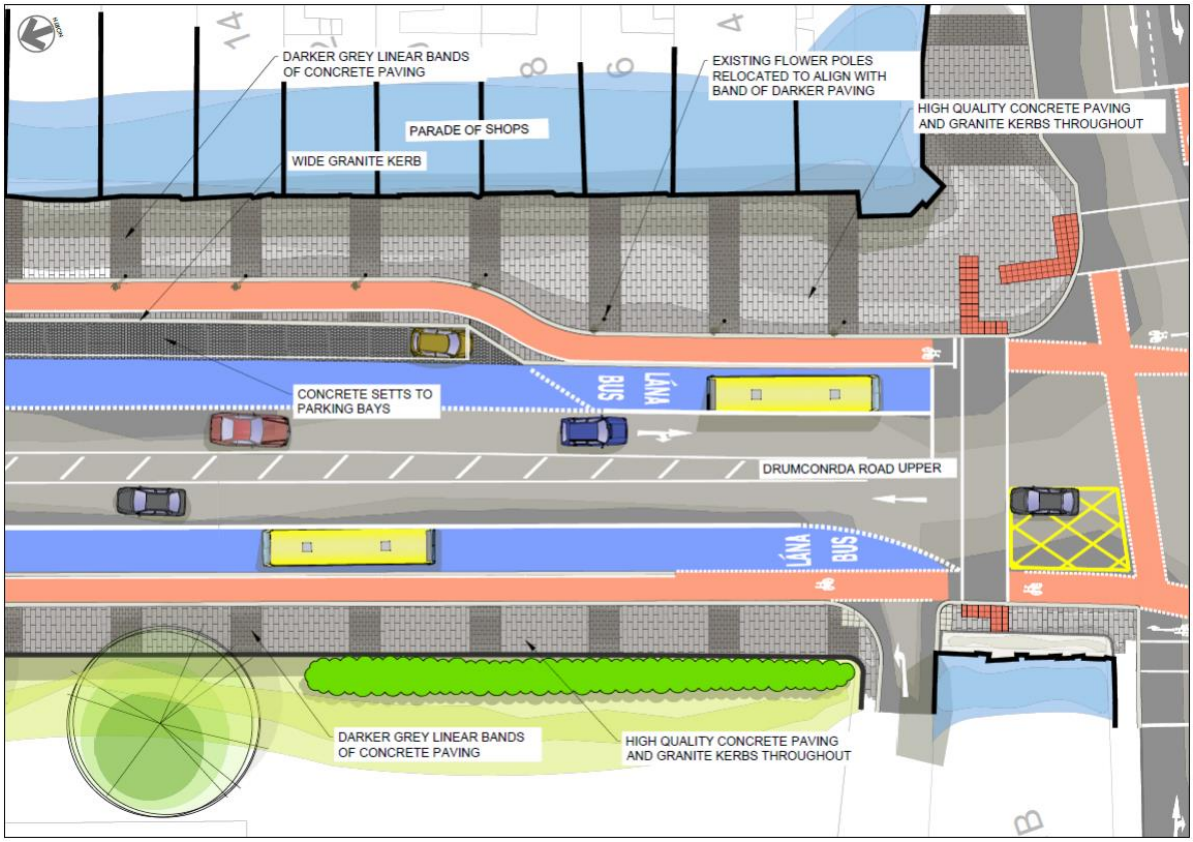

Image 6-11: Drumcondra Road Upper Shopping Parade Indicative Design

A new pedestrian and cycle bridge is proposed along the western edge of Frank Flood Bridge leading into Our Lady's Park.

The proposed bridge would require the removal of two Poplar trees within Our Lady's Park which are a different variety to one another and six Silver Birch trees adjacent to Millmount Terrace. Six new smaller-sized trees have been proposed surrounding the square paved area in Our Lady's Park, subject to underground utilities. Three new small canopy trees are proposed at the west end of the bridge adjacent to Millmount Terrace.

The existing square area of paving surrounding the statue on the south side of the river will be replaced and enhanced with a combination of stone and concrete paving together with new seating as a local area enhancement. The path close to the river will be re-aligned and re-surfaced to meet with the new paved square. Additional planting is to be provided on the eastern side of the path to prevent access to the narrow embankments leading to the river side beneath the structure.

The bridge structure and its parapets have been designed to be slender and visually 'light' to enable views of the existing road bridge to be retained. A two-tone colour scheme has been adopted which will create distinction between the central girder and the edge member preventing it appearing monolithic. The parapet top rail, posts and edge member are proposed to be painted light grey. The central girder is to be coloured oxide red which reflects the dark red brick colour in some of the buildings in proximity to the bridge. The proposed mesh panel of the parapet is to be stainless steel. The soffit of the bridge shall be painted black to create a shadow effect further improving the slender appearance of the edge member.

The bridge deck is proposed to be an anti-slip surface consisting of aggregate bonded together with an epoxy resin. This surface continues to the junction with Millmount Terrace to provide a consistent application of the same material. The cycle way section will be coloured 'Tuscan Terracotta' resin or similar in order that it appears as a tone that complements the standard cycle ways. The footway section will be coloured in a grey resin in order that it complements the new paved footways in the area (Image 6-12).

The space between the bridge soffit and ground is to feature pebbles set in mortar to discourage anti-social behaviour.

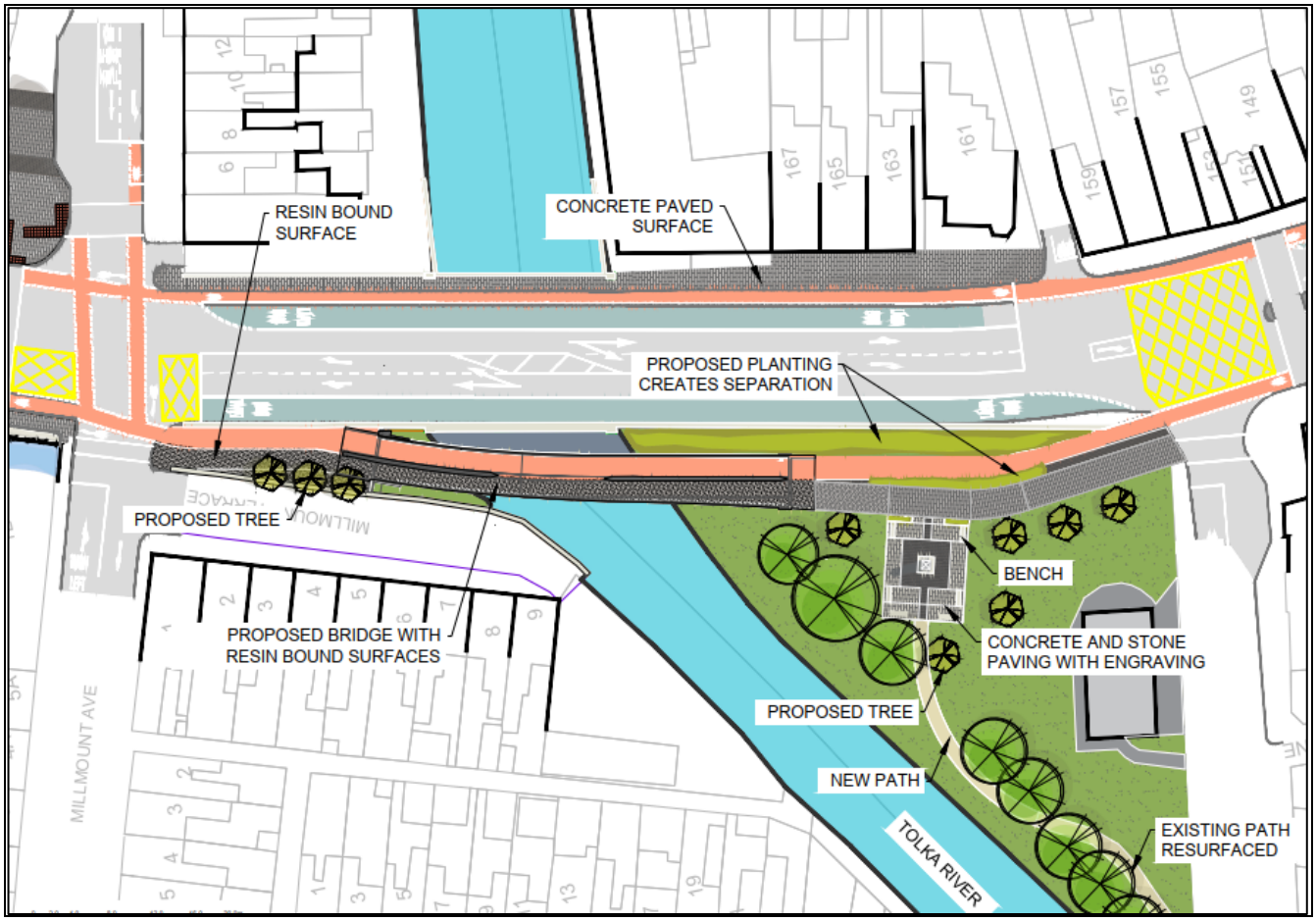

Image 6-12: Frank Flood Bridge Indicative Design

6.5 Section 5: Botanic Avenue to Granby Row

To facilitate bus lanes and cycle tracks in each direction it is necessary to remove one inbound and one outbound traffic lane between Clonliffe Road and Eccles Street. In addition, the landscaped central reserve will be removed between Portland Avenue and Belvedere Road to facilitate the required cross-section. South of Belvidere Road, the existing landscaped central reserve will be maintained.

Continuous bus lanes will be provided throughout, with the exception of a short section of signalised bus priority inbound between Whitworth Place and Portland Place. On Dorset Street Lower, south of Eccles Street, some minor kerb realignments are proposed to provide bus, cycle and a single traffic lane in each direction. The painted central reserve will be removed to facilitate this. Four existing cellars are affected by the Proposed Scheme. The cellars will be acquired and infilled with concrete.

It is proposed to provide new turning restrictions at the following junctions:

- Left turn ban from Dorset Street to Synott Place;
- Right turn ban from Dorset Street Lower inbound to Eccles Street, and
- Left turn ban from Dorset Street to Hardwicke Place.

On North Frederick Street, the existing bans on left-turning traffic from Dorset Street Lower and straight through traffic from Blessington Street will be maintained. North Frederick Street is restricted to one southbound traffic lane and one northbound traffic lane from the junction of Dorset Street with Gardiner Row.

South of Gardiner Row the existing southbound traffic lane and bus lane will be maintained. This section of the Proposed Scheme ties into the existing street layout at Parnell Street. Two-way cycle facilities will be provided on the west side of Parnell Square East. The right turn slip lane from Parnell Square North will be closed to facilitate the two-way cycle track.

Outbound buses will use Parnell Street, Parnell Square West and Granby Row to access Dorset Street Upper. A bus lane will be provided along these roads to facilitate outbound buses.

The existing signalised junctions at Clonliffe Road; Whitworth Road; Belvedere Road, North Circular Road, Gardiner Street Upper, Eccles Street and North Frederick Street/Blessington Street are proposed to be upgraded to provide improved infrastructure for pedestrians and cyclists.

At-grade cycle tracks have been utilised in order to maintain the existing kerb lines as the route approaches the city centre. The cycle tracks will be at carriageway level and segregated from general traffic using slip formed kerbs. At-grade cycle tracks have been proposed at Drumcondra Road Lower, southbound and Dorset Street Lower, between Portland Place Junction and Eccles Street Junction.

Maintenance works are proposed for the existing brick structure at the northern end of Drumcondra Road Lower to remove the graffiti which will in turn enhance the street scene and perception of safety in the area.

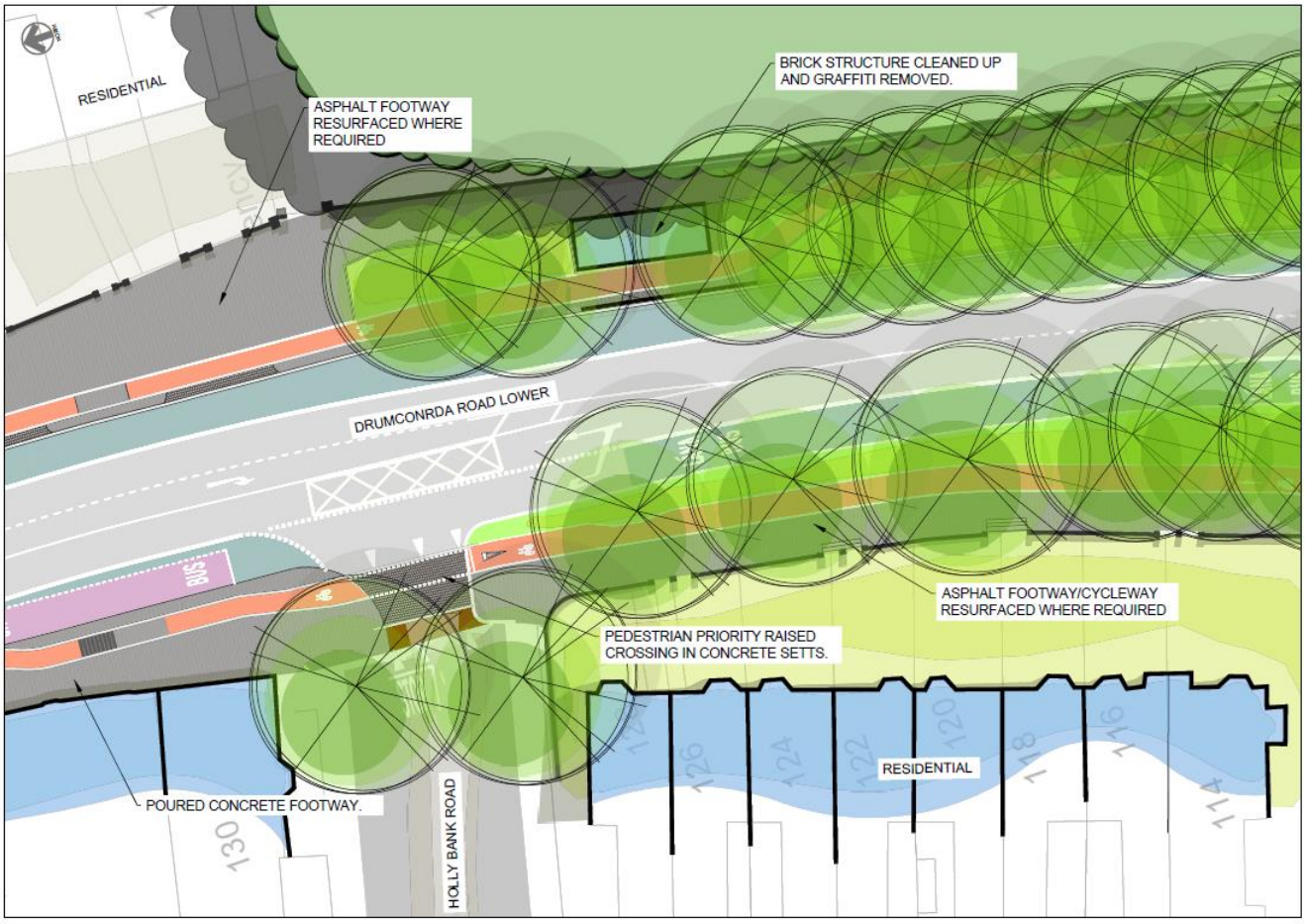

Image 6-13: Northern End of Drumcondra Street Lower Indicative Design

Although not required to deliver the Proposed Scheme, there is the potential to include a local area enhancement to the paved area outside the café in the residential area west of Drumcondra Road Lower. The concept proposal includes high quality grey concrete paving and granite kerbs (Image 6-14).

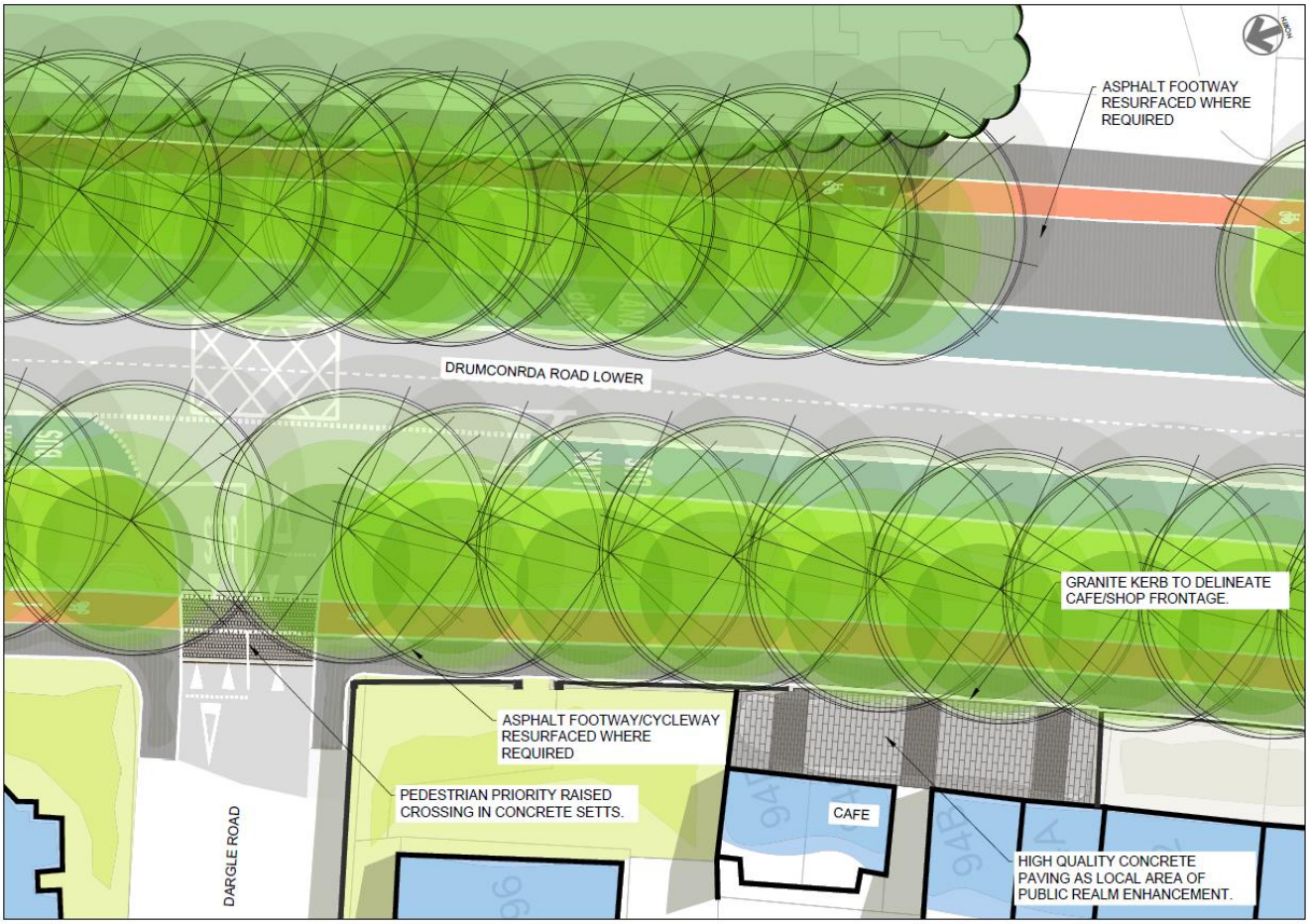

Image 6-14: Café and Footways in the Residential Area West of Drumcondra Street Lower Indicative Design

The urban realm in the Drumcondra Rail Station and Bridge area is to be improved by de-cluttering the footways. Any realignment to footways due to proposed works would be reinstated with materials to match the existing materials. The retention and reuse of paving and quality kerb materials is proposed where possible.

Between Drumcondra Station and Frederick Street North any footways effected by kerb realignments are proposed to be resurfaced in materials to match the existing footways using high quality granite paving and kerbs as required with the retention and reuse of paving and kerb materials proposed in this section.

The redesigned median at the northern part of the section is proposed to be finished in materials to match the existing scheme. Existing tree species and tree pits will be reviewed as a result of recent failures. Replanting of these tree avenues with a more appropriate resilient species is proposed and will be detailed in consultation with the authority. Pruning for maintenance is also proposed to other existing street trees.

Good quality concrete paving and granite kerbs are proposed for North Frederik Street and Granby Row. Retention and reuse of existing granite kerbs are proposed where possible.

Permanent acquisition of cellars and private landings is required within this Section along Dorset Street Upper.

7. Construction

The Construction Phase for the Proposed Scheme is anticipated to take approximately 36 months to complete. It will be constructed based on individual sectional completions that will individually have shorter durations typically ranging between 3 to 18 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:
  - Alterations to parking and access;
  - Implementation of pedestrian and cyclist safety measures;
  - Implementation of road closures or diversions;
  - Topsoil and subsoil excavation;
  - Works to cellars;
  - Adjustment or upgrades to drainage;
  - Realignment, replacement or protection of utilities and services;
  - Construction of pavement, including carriageway, kerbs; changing roundabouts to signalised junctions; modifications to parking and loading bays; upgrades to footpaths; installation of cycle tracks; improvements covering existing and new bus stops (island, shared landing area, inline, layby types, plus shelters, CCTV and information displays); etc.;
  - Upgrade of road furnishings (including street furniture, signage, lighting, and communication systems);
  - Bridge construction adjacent to the Frank Flood Bridge River Tolka crossing;
  - Strengthening works to the Frank Flood Bridge River Tolka crossing;
  - Landscaping.
  - Construction site decommissioning, including the removal of all construction facilities and equipment.

Construction Compounds along the Proposed Scheme will be located as follows:

- Construction Compound SW1: Cloghran Roundabout;
- Construction Compound SW2: Collinstown Cross;
- Construction Compound SW3: Coolock Lane;
- Construction Compound SW4: Collins Avenue; and
- Construction Compound SW5: Drumcondra Bridge.

Construction Compounds will be used as the primary location for the storage of materials, plant and equipment, site offices, worker welfare facilities and limited car parking. They will be secured, to ensure the safe storage of all on-site material and machinery. Temporary fencing will be erected, and site security will be employed. The Construction Compounds are shown in Image 7-1 to Image 7-5.

The Construction Compound SW1 will be located northeast of the Cloghran Junction, with access / egress from Swords Road, as shown in Image 7-1.

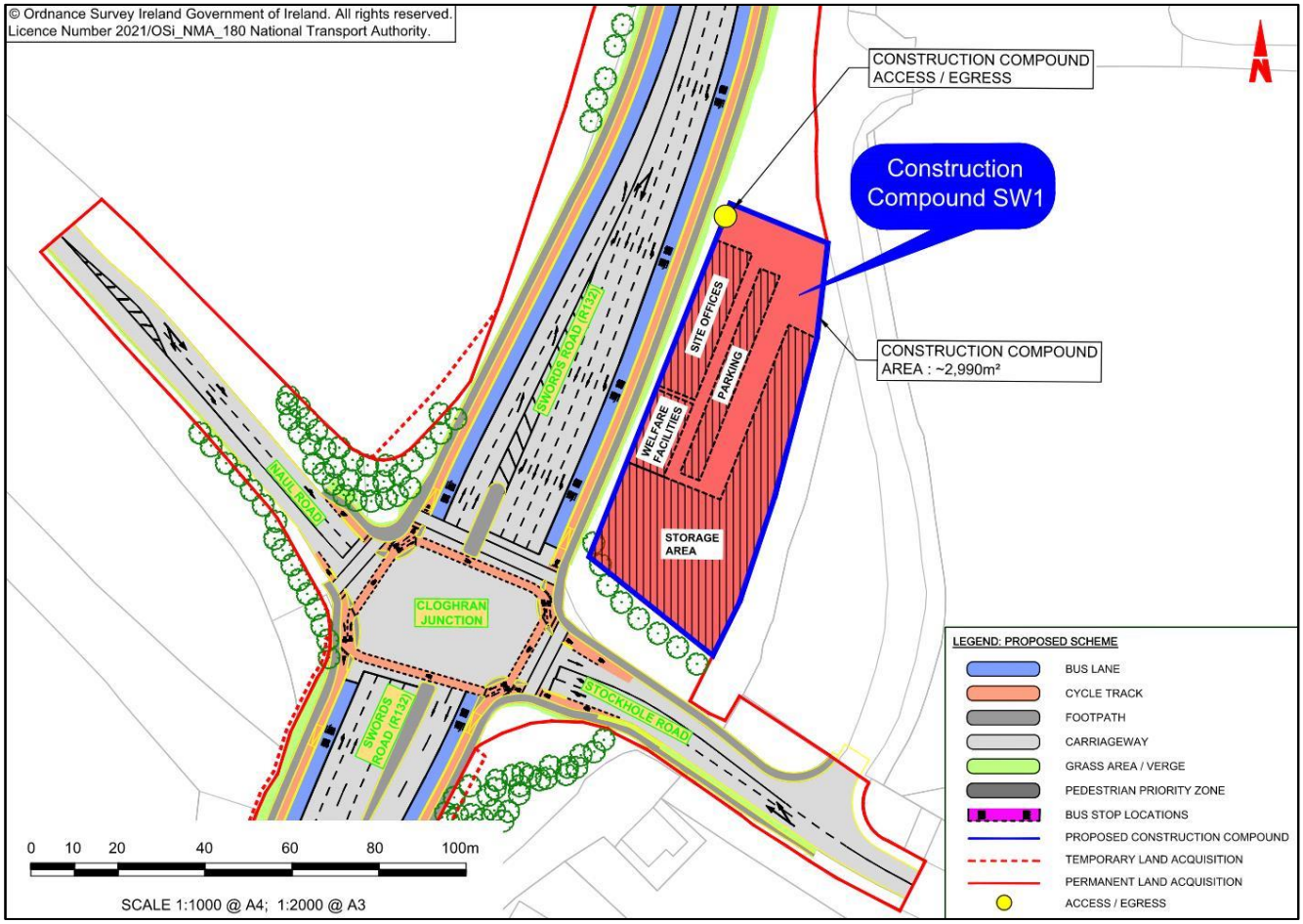

Image 7-1: Location and Extent of Construction Compound SW1

Construction Compound SW2 will be located southwest of Collinstown Cross, with access / egress from Old Airport Road, as shown in Image 7-2.

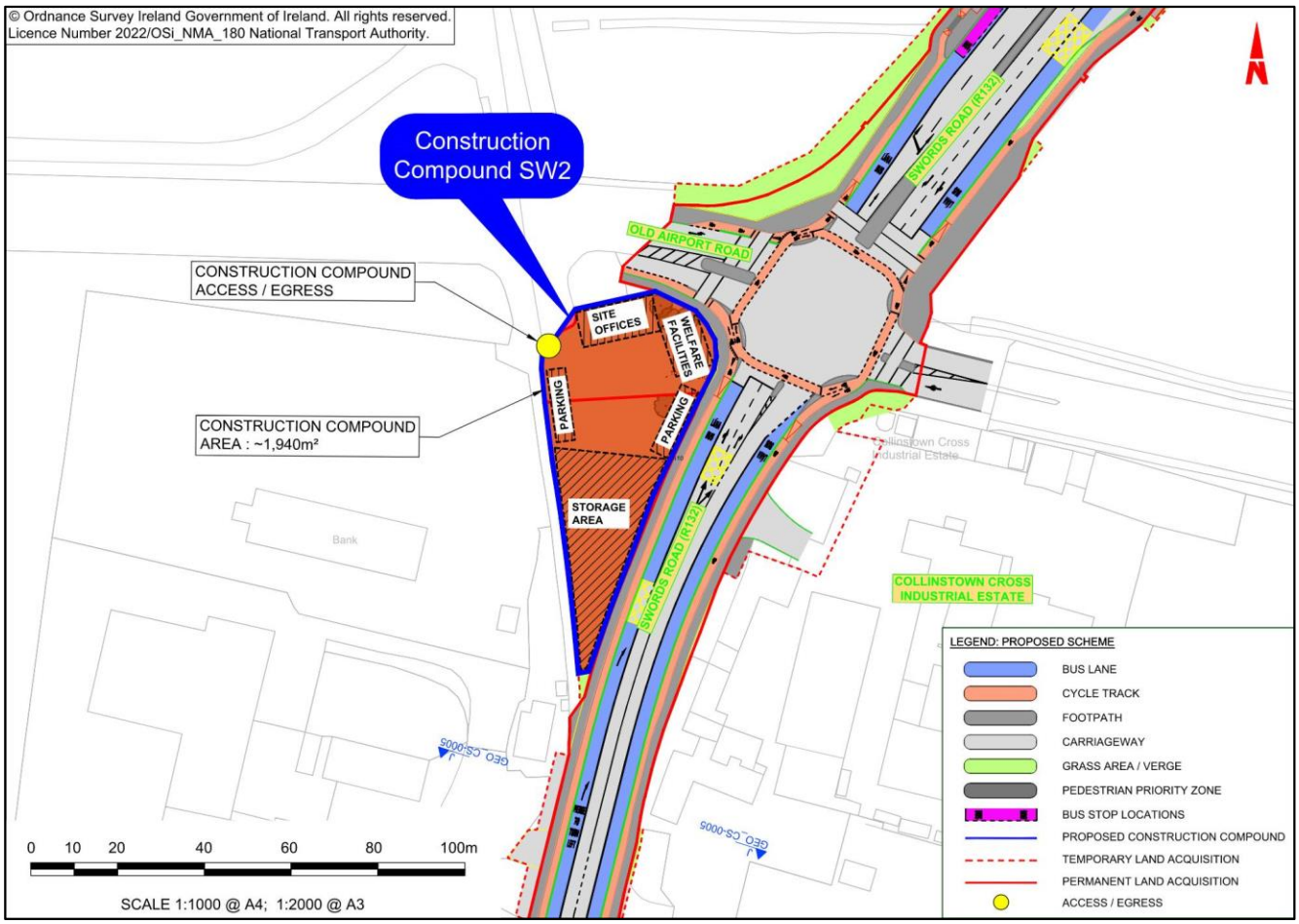

Image 7-2: Location and Extent of Construction Compound SW2

Construction Compound SW3 will be located north of Coolock Lane, with access / egress from Coolock Lane, as shown in Image 7-3.

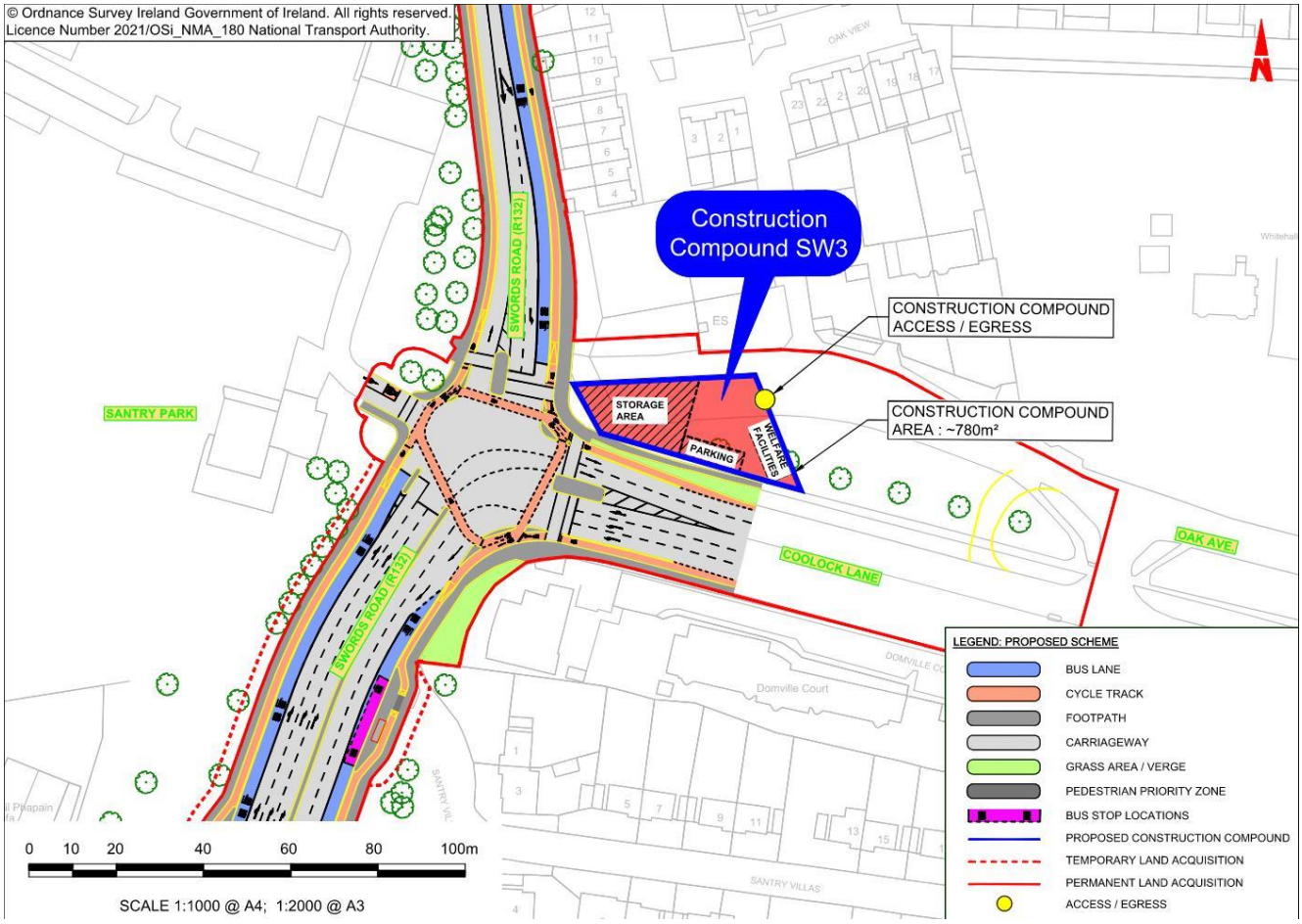

Image 7-3: Location and Extent of Construction Compound SW3

Construction Compound SW4 will be located at Collins Avenue Junction, with access / egress from Swords Road, as shown in Image 7-4.

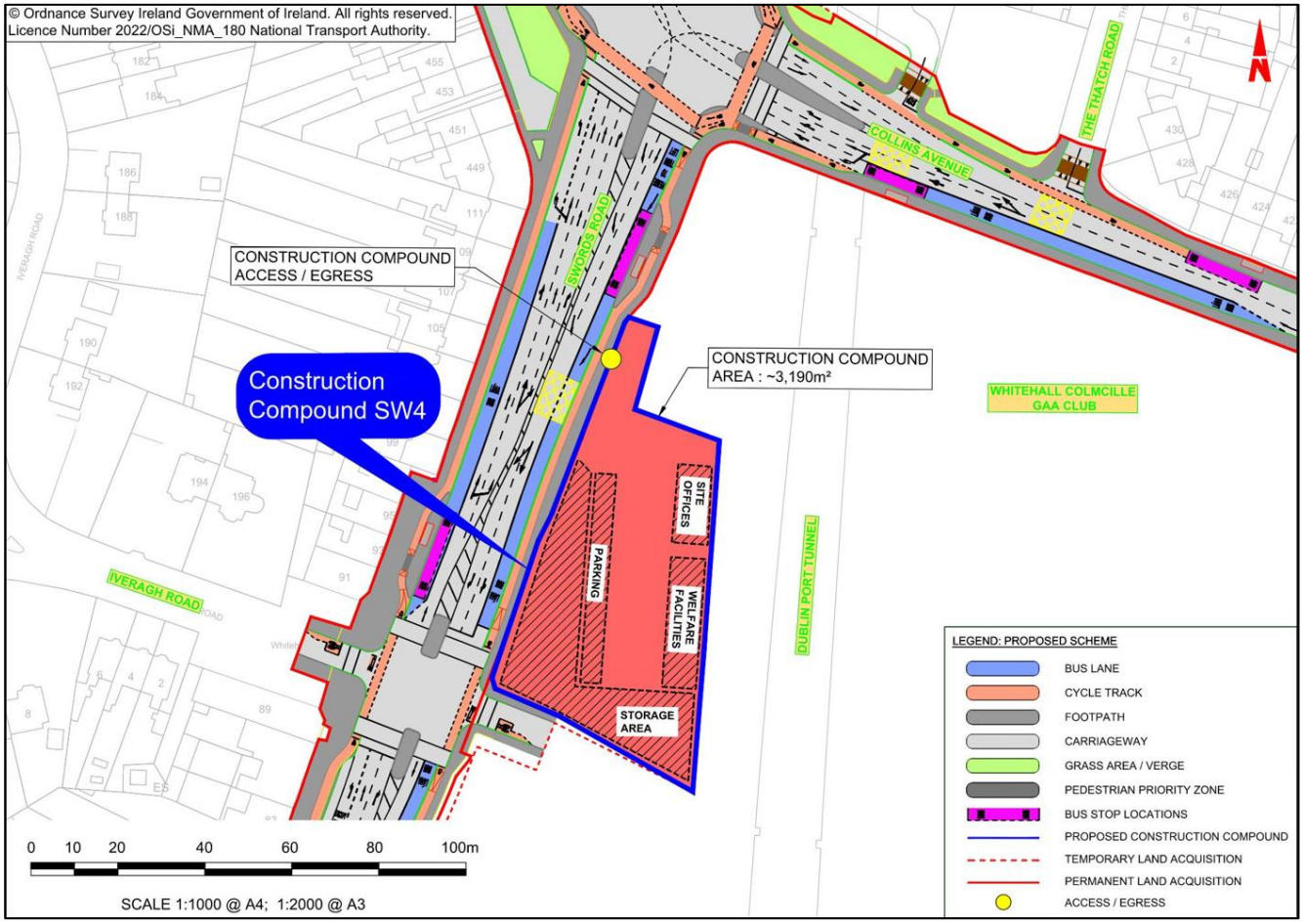

Image 7-4: Location and Extent of Construction Compound SW4

Construction Compound SW5 will be located at Frank Flood Bridge, between Tolka River and Botanic Avenue, with access / egress from Botanic Avenue, as shown in Image 7-5.

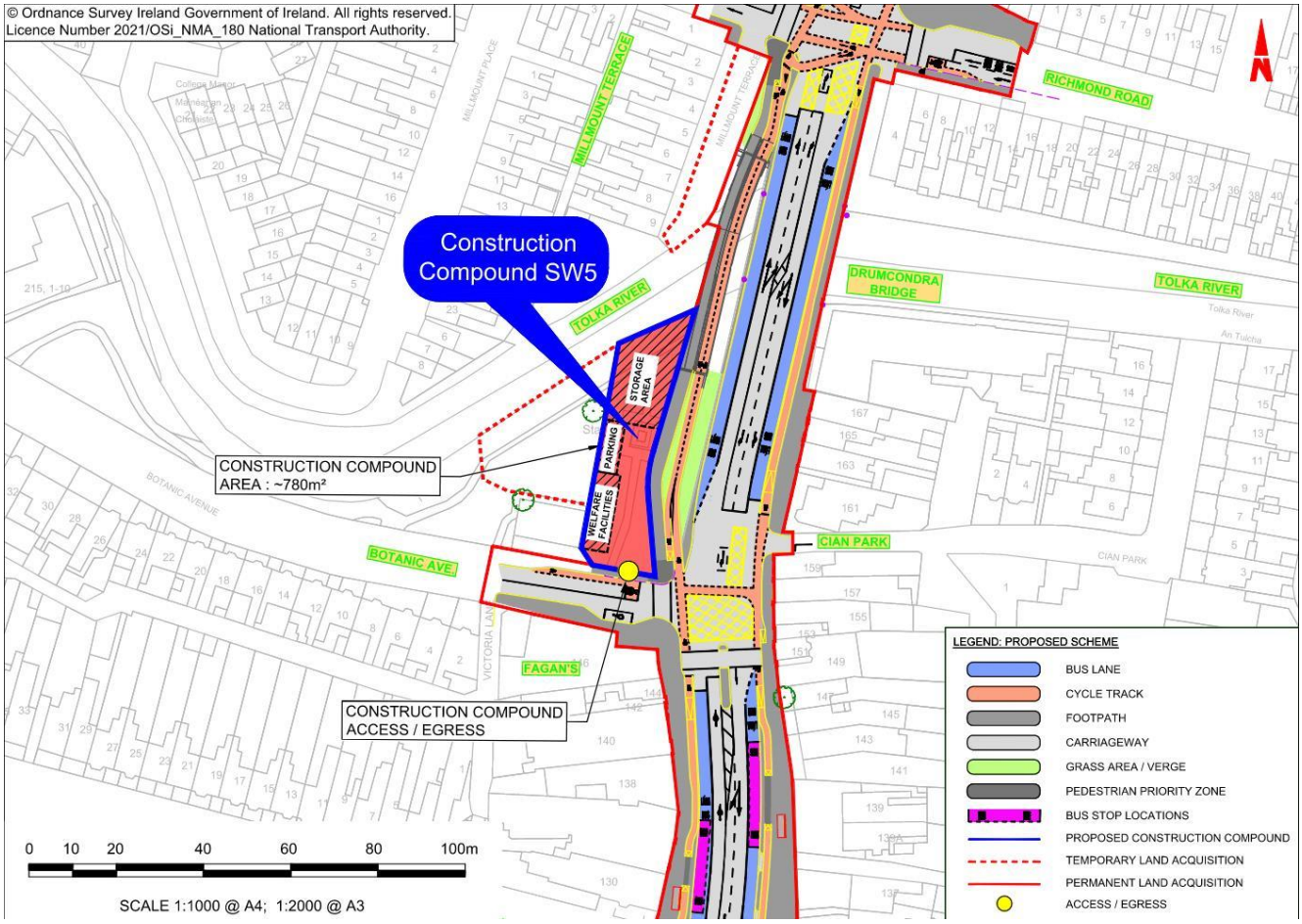

Image 7-5: Location and Extent of Construction Compound SW5

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 any 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 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 (CTMP) has been prepared to demonstrate the manner in which 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 will be maintained as far as reasonably practicable. While there will 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.

Wherever possible, cycle and pedestrian routes will be maintained along the route throughout the duration of the construction works. If necessary, alternative routes will be provided to facilitate both pedestrian and cycle movements. Bus services will be maintained, however some existing bus stop locations will need to be temporarily relocated to accommodate the works.

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 36-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 temporary 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.

The NTA (the Employer for the construction works) shall set out the Employer's Requirements in the Construction Contract and will ensure that all applicable mitigation measures identified in the EIAR, as well as additional measures required in any conditions attaching to An Bord Pleanála's decision to grant approval are adhered to. The 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, which in turn shall contain all mitigation measures detailed in this EIAR and the relevant documentation appended thereto.

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 and Transport;
- Air Quality;
- Climate;
- Noise & Vibration;
- Population;
- Human Health;
- Biodiversity;
- Water
- Land Soils Geology & Hydrogeology;
- Archaeological & Cultural Heritage;
- Architectural Heritage;
- Landscape (Townscape) & Visual;
- Waste & 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 networks and the traffic modelling.

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

- The assessment of physical changes:
  - **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 assessment:
  - **People Movement:** An assessment has been carried out to determine the potential impact that the Proposed Scheme will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the Proposed Scheme during the Operational Phase;
  - **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, documented in a Construction Traffic Management Plan, 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 Construction Environmental Management Plan will be prepared by the appointed contractor to encourage its personnel to travel to site by sustainable modes.

The assessment concludes that the impact during the Construction Phase will be Negative, Slight to Moderate, and Temporary in nature with the application of the proposed mitigation measures described above.

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:** The improvements to the quality of the pedestrian infrastructure will be Positive, Very Significant and Long-Term effect to the quality of the pedestrian infrastructure along Section 1, Positive, Moderate and Long-term in Section 2, Positive, Significant and Long-term in Sections 3, Positive, Very Significant and Long-Term in Section 4 and Positive, Very Significant and Long-Term for Section 5 of the Proposed Scheme.
- **Cycling Infrastructure:** The potential improvements to the quality of the cycling infrastructure will be Positive, Slight and Long-term in Section 2, Positive, Moderate and Long-term in Section 1 and Positive, Very Significant and Long-term in Sections 3, 4 and 5.
- **Bus Infrastructure:** The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will be Positive, Slight and Long-term in Section 1, Positive, Moderate and Long-term in Section 2, Positive, Profound and Long-term in Section 3, Positive, Very Significant and Long Term for Section 4 and Positive, Very Significant and Long-Term for Section 5.
- **Parking and Loading:** The results of the assessment demonstrate that the changes to the parking and loading provision will result in an overall loss of 88 spaces (-27 spaces in Section 2, -8 spaces in Section 3, -4 spaces in Section 4, and -19 spaces in Section 5). Given the nature of the loss in

parking and the availability of alternative spaces in the indirect study area, the impact is expected to be Negative, Slight to Moderate, Long-Term in Sections 2, 3, 4 and 5.

- **People Movements:** Overall, it is adjudged that the Proposed Scheme will have a Positive, Very Significant and Long-term impact on the sustainable movement of people along the corridor.
- **Bus Network Performance Indicators:** Overall it is anticipated that the improvements to the network performance indicators for bus users along the Proposed Scheme will be Positive, Significant and Long-term.

General Traffic Network Performance Indicators: Overall, it has been determined that the impact of the reduction in general traffic flows along the Proposed Scheme will be Positive, Moderate and Long-term whilst the impact of the redistributed general traffic along the surrounding road network will be Negative, Slight and Long-term. Thus, overall, 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. The Proposed Scheme will deliver strong 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 attractive alternatives 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.

Given that the Proposed Scheme results in a positive impact for walking, cycling, bus and people movements, 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 the mitigation measures are incorporated into the Proposed Scheme and no further mitigation measures are required to be considered.

Additional analysis undertaken using the Proposed Scheme 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 most parts of the Proposed Scheme meets National and European Union air quality standards. However, the annual mean limit value for nitrogen dioxide (NO_2) was exceeded at monitoring locations in proximity to the junction of Wellpark Avenue on the Upper Drumcondra Road.

The impacts assessed for the Construction Phase include dust emissions from activities such as site clearance and preparation, utility diversions, road and junction construction works, earthworks and landscaping. The assessment concluded that Construction Phase dust emissions will be Neutral, Short-Term post mitigation and monitoring. 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 Construction Phase traffic and changes in traffic flows have also been assessed. The assessment concluded that Construction Phase traffic emissions will be Neutral, Short-Term in nature and therefore the impact on air quality will not be significant.

The assessment of potential air quality impacts associated with road traffic impacts on local ecological receptors was assessed as Negative, Slight, Short-Term post mitigation and monitoring.

The assessment of potential air quality impacts associated with Construction Phase activities concludes that the works will be neutral and short-term in nature, and with the application of the proposed mitigation measures, the impact on air quality will not be significant.

The impacts assessed for the Operational Phase include the potential air quality impacts associated with changes to traffic flows along the Proposed Scheme due to realigned traffic lanes and traffic flows. Moderate adverse impacts are predicted on the R101 North Circular Rd and the R108 Phibsborough Road. However this is a result of high baseline pollutant concentrations alongside an increase in traffic flows at this location as a result of the Proposed Scheme. With vehicle emission technology improving, it is anticipated that impacts associated with the Proposed Scheme in this location would be short-term. In general, the impacts associated with the Operational Phase traffic emissions are predicted to be overall neutral and long-term.

8.3 Climate

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

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 are also assessed as part of the assessment. Construction traffic and the embodied carbon (i.e. the total energy required to make / produce and product of 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 CO_2eq emissions of 8,396 tonnes embodied CO_2eq for materials over a 36-month period. The IEMA Guidance (IEMA 2022) states that *"Carbon budgets allow for continuing economic activity, including projects in the built environment, in a controlled manner".* Thus, projects which have a carbon footprint are not necessarily significant provided that the projects are compatible with net zero by 2050 and the full range of mitigation measures are employed to minimize the carbon footprint. Given that the construction of the Proposed Schemes itself will lead to operational GHG emission reductions overall then the construction phase should be viewed as compatible with net zero emission targets. Thus, the assessment of significance for the construction phase of the Proposed Scheme is deemed to have a minor adverse impact given that the construction phase emissions are equivalent to an annualised total of 0.007% of Ireland's non-ETS 2020 target and 0.047% of the 2030 Transport Emission Ceiling. The potential impact to climate due to embodied carbon emissions during the Construction Phase, prior to mitigation, will be Negative, Minor and Short-Term.

The Proposed Scheme is estimated to result in total Maintenance Phase greenhouse gas emissions of 125 tonnes CO_2eq over the predicted 60-year lifespan. The annualised emissions due to the ongoing maintenance of the Proposed Scheme is predicted to reach, at most, 0.00001% of Ireland's non-ETS 2030 emissions target and 0.00003% of the 2030 Transport Emission Ceiling.

The predicted impact to climate during the Maintenance Phase, after mitigation, is Negligible and Permanent due to widening of the road corridor and increased maintenance requirements. The Operational Phase traffic greenhouse gas emissions associated with the Operational Phase of the Proposed Scheme is predicted to be Positive, Minor and Permanent. Thus, the residual impact from Operational Phase traffic as a result of the Proposed Scheme will be Positive, Minor and Permanent. Overall, when the carbon emissions associated with the maintenance phase and the Operational Phase are combined, the net GHG emissions will be Positive, Minor and Permanent.

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 21,130 and 21,150 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 (CAP). The

greenhouse gas emissions associated with the Operational Phase of the Proposed Scheme (i.e. maintenance of the scheme infrastructure), after mitigation, is predicted to be Positive, Minor and Permanent.

The CBC Infrastructure Works will also support the delivery of government strategies outlined in the Climate Action Plan and the 2021 Climate Bill 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 (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.

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 impacts assessed for the Construction Phase included the generation of noise and vibration from general road works including road and junction reconfiguration and resurfacing works, and where required, road widening works, utility diversions, bridge construction, Quiet Street Treatment, urban realm improvements including landscaping, boundary wall construction and other ancillary works. Construction traffic routes were also assessed as part of the assessment.

For the duration of the Construction Phase, appropriate mitigation and monitoring 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 these mitigation measures, all key Construction Phase residual noise levels will be Not Significant, whilst meeting the Proposed Scheme objectives.

Once operational, there will be a Direct, Positive, Imperceptible to Slight impact along the Proposed Scheme due to a reduction in traffic volumes during both the Opening Year (2028) and the Design Year (2043).

During the Opening Year (2028), increased traffic noise levels will occur along a small number of roads adjacent to the Proposed Scheme as a result of traffic re-distribution during daytime periods. During this initial short to medium term phase, an Indirect, Neutral, Imperceptible and Short to Medium-Term impact to Indirect, Negative, Moderate and Short to Medium-Term impact is calculated.

During the Design Year (2043), increased traffic noise levels will occur along a small number of roads adjacent to the Proposed Scheme as a result of traffic re-distribution during daytime periods. During the long-term phase, residual impacts are calculated as Indirect, Positive, Imperceptible and Long-Term to Indirect, Negative, Slight to Moderate and Long-Term.

The results of the noise assessment for the Operational Phase confirms that with the introduction of the various measures included as part of the Proposed Scheme, a reduction in traffic noise can be achieved along the Proposed Scheme where highest existing traffic noise levels are experienced. The various design measures

associated with the Proposed Scheme also align with the various intervention measures recommended within the World Health Organisation Environmental Noise Guidelines to reduce traffic noise exposure across populations.

There are no significant residual Operational Phase noise or vibration impacts associated with the Proposed Scheme, whilst meeting the Proposed Scheme objectives.

8.5 Population

The population assessment considered impacts on residential properties, community facilities and commercial businesses within the study area. The study area for the Proposed Scheme consists of 13 community areas which have an approximate total population of 116,000 according to the 2016 Census (CSO 2016a): Swords, River Valley (Swords), Larkhill - Whitehall – Santry, Marino, Drumcondra, Glasnevin, Iona Road, North William Street, Gardiner Street, Berkeley Road, Sean Mc Dermott Street, Dominick Street, Pro Cathedral.

The Proposed Scheme will commence in the community area of Swords, a large suburb north of Dublin City and one of the fastest growing urban areas in the State. The Proposed Scheme will continue south from Swords and will pass Dublin Airport before it will cross under the M50 Motorway into Dublin City. The route from Swords to the M50 Motorway is a mixture of residential and commercial areas, with some farmlands located both north and south of Dublin Airport. Once passed the M50 Motorway, the Proposed Scheme will continue through largely residential and mixed commercial / residential areas of Santry and Whitehall, both located in the community area of Larkhill – Whitehall – Santry. The Proposed Scheme will then pass through the community areas of Drumcondra, Marino, Glasnevin, North William Street, Iona Road and Gardiner Street before it will cross the Royal Canal into Dublin City Centre. Here, the area that will surround the Proposed Scheme is more urban in character, with more commercial and fewer residential properties. The Proposed Scheme will terminate in the City Centre in the community areas of Pro Cathedral, Berkeley Road, Sean McDermott Street and Dominick Street.

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

- Indirect amenity impacts on community facilities and commercial businesses from a combination of residual air, noise, traffic and visual impacts. Direct amenity impacts on commercial businesses that may impact on 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.

The community assessment concluded that there will be a Negative, Significant, Temporary / Short-Term impact on residential receptors due to land take and a Negative, Moderate to Significant but Short-Term impact on community receptors; Rotunda Hospital and Mater Private Hospital in the Construction Phase.

The economic assessment concluded that there will be a Negative, Profound impact on a commercial building, Mini Fix, at Collinstown Cross during the Construction Phase.

There are also a number of Negative, Moderate, Short-Term impacts predicted with respect to community and commercial accessibility during the Construction Phase.

During the Operational Phase Positive, Neutral to Not Significant, Long-Term impacts are expected on the community and commercial amenity of the Proposed Scheme. Long-Term, Positive, Not Significant to Profound impacts are predicted on community and commercial accessibility for pedestrians, cyclists and bus users.

There are Negative, Profound, Long-Term Operational Phase impacts predicted due to community land take (Mini Fix commercial building at Collinstown Cross).

There are also some localised Negative, Slight, Long-Term, impacts predicted with respect to accessibility for private vehicles during the Operational Phase, particularly in the Sean McDermott Street area.

The 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.

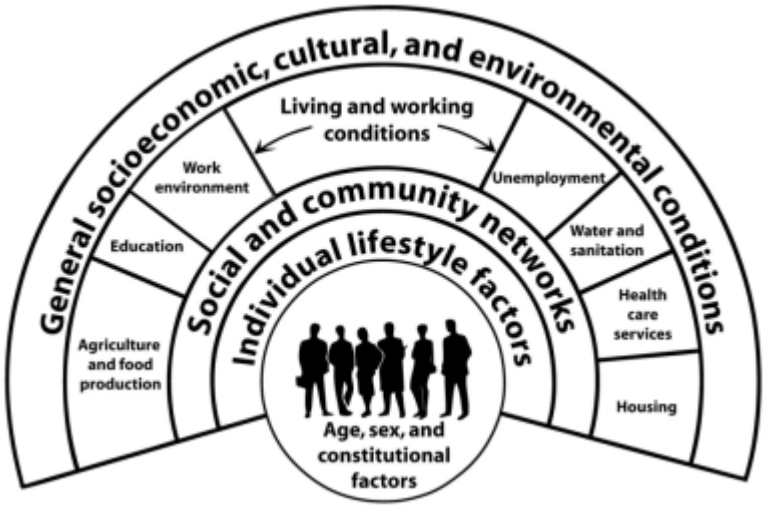

Image 8-1: Wider Determinants of Health

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 set 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 the Construction Phase will likely cause frustration and annoyance particularly for commuters and people travelling to appointments. Construction Phase 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 Environmental Impact Assessment Report.

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 short-term overall and temporary, 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 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 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 European site. The nearest European site is South Dublin Bay and River Tolka Estuary SPA followed by Malahide Estuary SPA and Malahide Estuary SAC, which are located approximately 1.9km, 1.96km and 1.93km east of the Proposed Scheme, respectively.

The main habitats within the Proposed Scheme include mixed broadleaf woodland, hedgerows, treelines, scrub, flower beds and borders, grassland, and building and artificial surfaces. The study identified:

- One protected plant species along the Proposed Scheme (hairy St. John's-wort *Hypericum hirsutum*, and woodland at Santry Demesne);
- There were two non-native invasive plant species listed on the Third Schedule of the Birds and Natural Habitats Regulations identified along the Proposed Scheme; Himalayan balsam *Impatiens glandulifera*, and Giant hogweed *Heracleum mantegazzianum*;
- Four bat species (Leisler's, common pipistrelle, soprano pipistrelle and unidentified pipistrelle species);
- Potential roost features in trees (locations where bats rest) in twelve locations and precautionarily idetified at two buildings ;
- Evidence of badger was identified at four locations along the footprint of the Proposed Scheme;
- Evidence of otters was recorded on the River Tolka at the Frank Flood Bridge;
- Suitible habitat for amphibians was recorded along the proposed scheme with no records of reptiles in the area; and

- A total of three sightings of kingfisher were observed within 1km of the Proposed Scheme;
- The desk study returned records of a total of 88 breeding bird species across the study area. This includes 26 species with both breeding and wintering populations.

Potential impacts on biodiversity for the Construction Phase may arise from:

- Site preparation and clearance;
- Removal of existing boundaries, pavements, lighting columns, bus stops, and signage;
- Removal of trees and vegetation;
- Protection and / or diversion of buried services;
- Road widening, pavement reconstruction, and kerb improvements;
- Demolition of existing retaining walls and buildings;
- Construction of new pedestrian/cyling bridge over the River Tolka;
- 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, including retaining trees identified as containing potential roost features for bats, and planting new street trees, hedgerows and species-rich grasslands. Invasive species management will be implemented to mitigate any risk of the Proposed Scheme contributing to the spread of invasive species during the Construction Phase.

The assessment concluded that with the application of the proposed mitigation measures, the impact on biodiversity during the Construction Phase will not be significant beyond the local level.

Potential impacts on biodiversity for the Operational Phase may relate to habitat loss, habitat degradation as a result of water quality changes from pollution or accidental spillage and non-native invasive plant species.

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

- Planting of treeline, hedgerow and grassland habitats within the Proposed Scheme, as outlined in the design, will provide suitable habitats for breeding birds and foraging / commuting habitat for bats; and
- The implementation of sustainable drainage measures will prevent habitat degradation.

The assessment concluded that there will be no significant impacts on habitats, rare and protected plant species, mammals, amphibians, reptiles, and fish during the Operational Phase.

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 the Proposed Scheme will not have any adverse effect on the integrity of any European site.

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 Hydrometric Area (HA) 09 (Liffey and Dublin Bay) catchment with one water feature located in the Hydrometric Area (HA) 08 (Nanny-Delvin). The waterbodies relevant to the Proposed Scheme are:

- Ward_040, which is approximately 11km and begins at Forest Road flowing north, parallel to the road for 673m before joining the main channel. In terms of assigning sensitivity, Ward_040 is of Moderate WFD status and is approximately 2.7km upstream of a designated site at its closest point to the Proposed Scheme. As such it is of Medium sensitivity.

- Sluice_010 rises to the north of Dublin Airport and flows in an easterly direction through the towns and surrounding areas of Greenwood, Abbeville, Kinsealy and Old Portmarnock before entering the Mayne Estuary and subsequently the Irish Sea. The River Sluice has a total length of 15.17km. Land along the water body is utilised for agricultural land use purposes with the downstream extents being residential. The Sluice_010 will be crossed by the Proposed Scheme at R132 Swords Roads, north of the Metropoint Business Park. In terms of assigning a sensitivity to it, it has Poor status under WFD; the crossing of it is more than 7km upstream of a designated site; and it is not a Special Protected Area. As such, it is classified as being of Low sensitivity.
- Mayne_010 has a total length of 16.52km and commences at Dardistown (west of the M50 / M1 Motorway Interchange). It flows under the interchange, parallel to the Northern Cross Route Extension (R139 Road) until it crosses the R107 Malahaide Road. From that point it flows through the Castlemoyne Estate, where is joined by a tributary known as Cuckoo Stream and then continues to flow under the Dublin / Belfast railway line before discharging to the Mayne Estuary, in which is part of the Baldoyle Bay SAC. The tributary (Environmental Protection Agency (EPA) name Cuckoo Stream) commences at Dublin Airport and flows under the M1 Motorway at Toberbunny and joining the main channel of Mayne_010 upstream of Balgriffin Park. Land to the north of the watercourse is utilised for agricultural land use purposes with land use to the south been predominantly urban. Mayne_010 will be crossed by the Proposed Scheme at R132 Swords Roads, north of the M1 Turnapin. The Mayne_010 tributary will also be crossed by the Proposed Scheme at R132 Swords Road, south of Dublin Airport Terminal 2. Mayne_010 has a Poor WFD Status and is At Risk of not meeting the WFD objective of Good Status by 2027. The main risks are anthropogenic pressures. The Mayne_010 has poor status; the crossing of it by the Proposed Scheme is approximately 6.5km from Baldoyle Bay SAC. It is assigned Low sensitivity.
- Santry_010 has its origins at Harristown Lane, south of R108 South Parallel Road. The Santry_010 flows through Silloge, under the M50 Motorway at Ballymun and through Santry Demesne. It then passes under the M1 / M50 Motorway at Santry, through Coolock where it flows into Santry_020 and under the Dublin / Belfast railway line before discharging to Dublin Bay at North Bull Island SPA/SAC. Land use within the catchment is predominantly urban with land surrounding the upstream portion of the river been used for agriculture purposes. The Santry_010 EPA segment will be crossed by the Proposed Scheme at R132 Swords Road, north of Santry Demesne. Santry_010 has a Poor WFD status and is At Risk of not achieving Good Status by 2027 due to a number of significant pressures such as urban wastewater, urban runoff from diffuse sources causing nutrient and organic pollution and altered habitat due to morphological changes in the watercourse.The Santry_010 is of Poor status; the crossing of it by the Proposed Scheme is approximately 6km from North Bull Island SPA/SAC. It is assigned Low sensitivity.
- Tolka_060 is the second largest river in Dublin and rises in the south-west of Dunshaughlin from where it flows through Dunboyne as Tolka_020 and Blanchardstown as Tolka_040, before entering the north-west of Dublin City as Tolka_050, becoming tidal downstream of Drumcondra at the Tolka_060 segment, and flowing into Dublin Bay along the northern edge of Dublin Port. Generally, the River Tolka has poor water quality, both biologically /ecologically and chemically. The EPA segment Tolka_060 will be crossed by the Proposed Scheme at Drumcondra, north-west of Holy Cross College. Its segment length is 3km and it flows directly into the Tolka Estuary approximately 500m after the point at which it will cross the Proposed Scheme. Tolka_060 has a Poor WFD status and is At Risk of not achieving Good Status by 2027. Its main pressures are due to urban runoff and urban wastewater from Combined Sewer Overflows. The crossing is 600m upstream of the Tolka Estuary which is a Nutrient Sensitivity Area under the UWWTD and a WFD Special Protected Area. It is also within the South Dublin and Tolka Estuary Special Protection Area. As such, it is classified as being of High sensitivity.
- Tolka Estuary is a transitional water body within the Tolka Estuary Nutrient Sensitive Area. Tolka Estuary is fed by the Tolka_060 which flows into Liffey Estuary Lower before reaching Dublin Bay. Tolka Estuary has a Poor WFD status and is At Risk of not achieving Good Status by 2027. The main risk is urban wastewater from Combined Sewer Overflows, as Tolka Estuary is impacted by Ringsend Wastewater Treatment Plant (WwTP) and the agglomeration network. Other than Ringsend WwTP, the most significant source of nutrients from the Tolka catchment to the Tolka Estuary is diffuse urban pollution, which will be reviewed as part of Irish Water's drainage network planning (EPA 2018). This water body is not directly crossed by the Proposed Scheme and surface water drains from the route of the Proposed Scheme do not drain into it, however it is only 600m downstream of the crossing of the Tolka_060 and activities proposed at that location pose a risk to this water body also. As a result, it is included in this assessment. In terms of assigning sensitivity

to this receptor, its Poor WFD status would normally result in a Low sensitivity, however as it is within the South Dublin and Tolka Estuary SPA, it is assigned VeryHigh sensitivity.

- Royal Canal (Royal Canal Main Line (Liffey and Dublin Bay)) is an artificial water body, primarily used for recreation and was constructed in the 18th century, shortly after the Grand Canal. The Royal Canal is 145km 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. Along the length of the Royal Canal there are 46 sets of locks. The Royal Canal will be crossed by the Proposed Scheme at Binns Bridge in Dumcondra. As stated in the EPA Water Quality in Ireland 2013 – 2018 Report (EPA 2019), assessments of the Royal Canal using macroinvertebrates indicates generally good biological conditions. Similarly, positive results were identified in terms of macrophyte assessment. The Royal Canal achieved good ecological potential in the period from 2013 to 2015.In terms of assigning sensitivity, this water body is of Good WFD status. It has an indirect hydrological connection to Dublin Bay SAC via the Liffey Estuary Lower. It is determined to be High sensitivity.
- Liffey Estuary Upper is a transitional water body and is within the Liffey Nutrient Sensitive Area. It is fed by the Camac_040, Liffey_190 and Poddle_010 and flows into Liffey Estuary Lower before reaching Dublin Bay. The Proposed Scheme does not cross this water body and there are no direct surface water discharges to it; however, the combined sewer system does outfall to it in times of high flow or emergencies through the Surface Water Overflows (SWOs). The only potential impacts on this water body would be during operation so it is not considered for construction related impacts.
- Liffey Estuary Upper has a Good WFD status and is At Risk of not achieving the WFD objective of Good Status by 2027. The main risk is urban wastewater from SWOs on the sewer network. The key impacts are considered to be nutrient pollution and alterations to habitats due to morphological changes. In terms of assigning it sensitivity, it is of Good status. It is not a designated site but has an indirect connection to Dublin Bay SAC via Liffey Estuary Lower. Liffey Estuary Lower is a WFD protected area. Sensitivity has therefore been determined to be High.

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

- Ward_040: Moderate WFD status and is At Risk of not achieving Good Status;
- Gaybrook_010: Poor WFD status and WFD Special Conservation Area;
- Sluice_010: Poor WFD status;
- Mayne_010: Poor WFD status and is At Risk of not meeting Good Status;
- Santry_010: Poor WFD status and is At Risk of not achieving Good Status;
- Tolka_060: Poor WFD status and is At Risk of not achieving Good Status;
- Tolka Estuary: Poor WFD status and is At Risk of not achieving Good Status;
- Royal Canal Main Line (Liffey and Diblun Bay); Good WFD status; and
- Liffey Estuary Upper: Good WFD status and is At Risk of not maintaining Good Status.

The existing drainage is largely a separate system with all but Section 5 of the Proposed Scheme (closest to the city centre) discharging to surface water sewers and ultimately to local water bodies. There are no direct discharges to Gaybrook_010. The main existing pressure on water quality relates to urban runoff and overflows from the foul and combined sewer network.

A Flood Risk Assessment has been completed for the Proposed Scheme which determined that the Proposed Scheme will be located in two Flood Zones, referred to as A, B and C. There is no identified risk of groundwater, estuarine or coastal flooding to the Proposed Scheme. The risk of flooding from these sources is therefore considered to be low.

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

There are a number of potential constructions related impacts which in the absence of mitigation could occur during the construction of the Proposed Scheme in relation to hydrology, water quality and hydromorphology. The potential for any of these types of impacts are considered for different construction activities for each water body within the study area. During the Construction Phase, the water quality of four of the six 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 to disrupt local drainage networks if they require 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 for protection of water bodies at Construction Compound locations and at the installation of the new bridge alongside the existing Frank Flood Bridge crossing the Tolka_060 and the associate diversion of ESB oil-filled cables, which will reduce or avoid negative impacts on the water body.

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 sustainable drainage systems in the form of swales, filter drains and attenuation ponds and tanks, which also reduce the potential risks to water quality from routine road contaminants.

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

Considering all requirements for compliance with the WFD, the Proposed Scheme will not cause a deterioration in status in any water body, and will not prevent it from achieving Good Ecological Status or Good Ecological Potential; there are no cumulative impacts with other developments; and it complies with other environmental legislation. It can be concluded that the Proposed Scheme complies with all requirements of the WFD.

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 a scheme walkover survey.

The geology (soils and rock) beneath the study area of the Proposed Scheme mainly comprises predominately glacial tills. Additionally, there are areas of made ground (Urban) and alluvium and gravels. The land within the study area is mainly used for urban developments, including but not limited to; industrial, commercial, residential, and recreational.

Two aquifers' (which store / produce groundwater) within the study area of the Proposed Scheme are classified as 'Locally Important' (moderately productive in local zones) and 'Low yielding' 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 reserve;
- Loss or damage of proportion of aquifer;
- Change to groundwater regime; and

- Loss or damage of a groundwater dependant habitat.

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 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 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.

The Proposed Scheme is routed along existing roads, through a heavily developed suburban and urban landscape. The Proposed Scheme route is bordered by items of archaeological and cultural importance. The Proposed Scheme will commence south of Swords in the townland of Miltonsfields, following the R132 Dublin Road through the townlands of Crowscastle, Nevinstown West and Fosterstown South in the parish of Swords and the barony of Nethercross. The road itself also acts as the townland boundary with the townlands of Cremona and Fosterstown North within Swords parish and forms a short segment of the boundary with the parish of Cloghran and the barony of Coolock.

The combination over several townlands of stray finds, burial sites and an outdoor cooking site suggests that this area was well-settled in the Bronze Age. It is likely that the continuity of settlement in this area, with intensive agricultural activity, has resulted in the destruction of earlier features through ploughing and other activities.

There is one national monument along the Proposed Scheme; The Parnell Monument, which is located *c*. 10m from the boundary of the Proposed Scheme. No works will take place within 15m of the monument and there will be no impact on the national monument.

There are also five archaeological heritage assets on the Records of Monuments and Places / Sites and Monuments Record (one being the Historic City of Dublin Zone of Archaeological Potential), three on the Dublin City Industrial Heritage Record, 8 cultural heritage features, and 22 non-designated archaeological sites 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 construction, repairs and reconstruction works;
- Road resurfacing works;
- Any excavations of soil, including landscaping works; and
- Any 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. Such works may also result in temporary negative impacts on the settings of the upstanding national monuments for the duration of the works.

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 negative 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.

Most of the study area is located outside the northern suburbs of Dublin, which until the 20th century largely consisted of agricultural land. Surviving thatched vernacular houses of note, include two thatched cottages located opposite each other on the Swords Road at Collinstown and Dardistown.

Early ecclesiastical sites include the 8th century Cloghran Church on Stockhole Lane and St. Pappin's Church of Ireland Church, Santry.

The historic agricultural landscape was interspersed with country houses and demesnes. The most significant of these was Santry House, which is now demolished, though the demesne survives in use as a park. Castlemoate House on the Swords Road, is a 19th century house which had walled gardens, outbuildings, parkland and gates complete with gate lodge, now in use as offices.

Many historic country houses were converted to religious and/or educational uses in the nineteenth and twentieth centuries. This is the case at Belvedere House, which was the site of a sixteenth century house, rebuilt in the early eighteenth century, which is now DCU St. Patrick's Campus. The historic buildings have been adapted and extended though the site retains the historic house, a tower, fountain, quadrangle, former church and stone boundary walls. A gate Lodge was added to the adapted entrance in the early twentieth century.

The Archbishop's House, sometimes still referred to as Bishop's Palace was a detached Victorian house with a gate lodge at the entrance, decorative entrance gates and stone boundary walls to Drumcondra Road. The Rosminian House for the Blind, Ormond Road was originally a Georgian house known as Clonturk House. The former entrance and gate lodge were sited at the corner of Ormond Road, but they have subsequently been lost to new development.

Drumcondra Road Lower is lined with nineteenth and early twentieth century red-brick terraced houses, many of which are included in the Dublin City record of Protected Structures. The terraces around the Bishop's Palace are raised above the road, which is lined with mature trees creating an attractive vista. There are examples of early suburban street lamps and historic ground surface treatments which contribute to the character of the road. The centre of Drumcondra consists of predominantly two or three storey terraced red brick or rendered shops. Some of these are included in the NIAH.

Significant modern and public buildings in the study area include the early twentieth century Art Deco Whitehall Garda Station, and the Church of the Holy Child.

Industrial heritage features include the mid-eighteenth century triangular milestone associated with turnpike road at Pinnock Hill. There are also a number of bridges in the study area which are included in the RPS and NIAH, including Frank Flood Bridge, which crosses the River Tolka and is within the Tolka River Conservation Area. The railway Bridge at Drumcondra Station is also included in the NIAH as is the Station itself. Binns Bridge crosses both the Royal Canal and the Railway. The bridge, the canal and Lock 2 are within the Royal Canal Conservation Area.

Inside the Royal Canal, Dorset Street, the North Circular Road, Belvedere Road, Synott Place, Gardiner Street upper, Frederick Street North, Dominic Street Lower, Eccles Street, Blessington Street, Hardwick Street, Mountjoy Street, St Mary's Place and Granby Row form part of the North Georgian City Core. The Georgian City Plan is characterised by terraced eighteenth and nineteenth century houses with pubs, banks and shops concentrated

at the corners. The area was laid out under the Gardiner and Jervis Estates and developed between 1714 and 1830. It has been proposed for designation as a UNESCO World Heritage Site.

There are a number of significant vistas from the study area to nearby churches and parks. These include the vista up Blessington Street towards the Blessington Street Basin, the vista down Gardiner Street towards Mountjoy Square, the vista down Parnell Square East Towards O'Connell St, and the reverse view from O'Connell Street towards the Rotunda Hospital. There are also important vistas towards St. Mary's Chapel-of-Ease (The Black Church DCC RPS 5456) from Granby Row and from Dorset Street to St Georges Church Hardwick Place (DCC RPS3573). The building is of national importance.

Institutional and educational buildings of note within the study area were developed in the late nineteenth and early twentieth centuries. They include Saint Francis Xavier Community Centre on Dorset Street Lower, Saint Raphael's Clinic in the Mater Hospital on Dorset Street which was formerly a school, Saint Saviour's Amateur Boxing Club on Dorset Street, which was formerly a fire station and the former Christian Brother's School in Open Heart House 2, St Mary's Place.

The Proposed Scheme terminates at Parnell (originally Rutland) Square, one of the city's great Georgian squares, and its oldest. The development of the Square began in 1745, when Doctor Bartholomew Mosse leased four acres to establish what later became the Rotunda Lying In Hospital. The associated gardens which became Rutland Square were originally developed as pleasure grounds which along with the Gate and Ambassador Theatres, were built to fund the hospital. Much of the original gardens have become built up with hospital buildings, including the nurse's home in the Plunkett Cairns wing. The north end is occupied by the Garden of Remembrance which was laid out in 1966 to commemorate the 1916 Easter Rising, but also commemorates the 1798, 1803, 1848, 1867 rebellions and the war of independence of 1919-1921. Other significant buildings on the square include Charlemont House, now the Hugh Lane Gallery and the Abbey Presbyterian (Findlater's) Church.

Street furniture of note within the study area includes nineteenth and early twentieth century cast iron post boxes and lamp posts, granite kerbing, paving and coal holes on Parnell Square and a fountain on Cavendish Row. The Parnell Monument is located at the junction of Cavendish Row and O'Connell Street Upper. It commemorates Charles Stewart Parnell (1846-1891) leader of the Home Rule Movement in the late nineteenth century. Both Parnell Square and Parnell Street are named after him. The statue was erected in 1899 and is of National importance. It, along with the southern half of Parnell Square, is within the O'Connell Street Architectural Conservation Area.

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

- Direct impacts to the boundaries (walls, railings etc.) and entrance gates of protected structures and other architectural heritage features where road widening is required;
- Direct impacts to street furniture (i.e. lamp posts, post boxes, statues 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 settings during the Construction Phase.

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

- Appropriate recording, protection, removal, storage and reinstatement of boundaries and street furniture;
- The retention or replacement of trees along the Proposed Scheme; and
- Careful consideration of shelter bus stops to avoid impacting on the settings of important architectural heritage features, where possible.

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), 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.

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

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 route, the Proposed Scheme spans the agricultural greenbelt separating Swords from the north city and passes to the east of Dublin Airport. From the south of Dublin Airport the Proposed Scheme follows one of the established historic access roads into the northern City Centre. The Proposed Scheme passes to the east of Santry Demesne (now a public park, Santry Park) and Morton Stadium, where a Tree Preservation Order is in place (Tree Preservation (Santry Demesne) Order 1987) on the former demesne lands. The Proposed Scheme will cross the River Tolka at Frank Flood Bridge, pass through Drumcondra Village and along its prominent mature tree-line streetscape before crossing the Royal Canal at Binns Bridge. The Proposed Scheme follows the urban thoroughfare of Dorset Street before moving into the North City Georgian area at Frederick Street North and Parnell Square in the City Centre.

The Proposed Scheme includes a wide variety of suburban and city landscape, townscape and visual features, from streetscape boundary and urban realm features, to residential and mixed-use zonings, historic landscapes and boundaries, to biodiversity and heritage assets.

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

- Site mobilisation and establishment, fencing and hoarding of Construction Compounds and works areas, including within private areas / gardens;
- Site demolition, including removal of buildings, 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, bridge, 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 require land acquisition (temporary and / or permanent) from a number of properties. Temporary fencing / hoarding will be erected and access to property for the owners / occupiers will be maintained as far as reasonably practicable. Works will require removal of existing and reinstatement of existing roadside boundary walls, railings, entrance gates together with areas of existing garden plantings, garden accesses and garden features.

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.

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.

With the implementation of the proposed mitigation measures, it is expected that there will be Negative, Significant Temporary / Short-Term Construction Phase impacts on the townscape/ streetscape character from Northwood Avenue to Shantalla Road, Negative, Significant and Temporary / Short-Term impacts on the townscape from Shantalla Road to Botanic Avenue and Negative Moderate / Significant Temporary / Short-Term between Botanic Avenue to Granby Row.

During the Construction Phase there will be Negative, Very Significant / Profound, Temporary / Short-Term impacts on residential property in temporary acquisition. There will be Negative, Significant, Temporary / Short-Term impacts on non-residential properties. There will be Negative, Significant, Temporary / Short-Term impacts on properties overlooking the scheme. There will be Negative, Significant, Temporary / Short-Term impacts on amenity designations at Santry and at Our Lady's Park, Drumcondra. Other amenity designation impacts will be Negative, Moderate, Temporary / Short-Term as will impacts on trees and vegetation, with a Negative, Slight / Moderate, Temporary / Short-Term impact on Tree Preservation Order / Tree Protection Objectives. There will be a Negative, Significant / Very Significant, Temporary / Short-Term impact on the River Tolka Conservation Area, with Negative, Moderate, Temporary / Short-Term impacts on other Conservation Areas and residential Conservation Areas. There will be a Negative, Significant / Very Significant impact on Thatched Cottage protected structure, and a Negative, Moderate, Temporary / Short-Term impact on other Protected Structures. There will be a Negative, Moderate, Temporary / Short-Term impact on Architectural Conservation Areas.

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

- Alterations in the corridor of the existing road / street;
- Changes in traffic, pedestrian and cycle movements;
- Modifications of areas of private property / gardens / boundaries; and
- Adjustments to other areas / boundaries.

The design process of the Proposed Scheme has considered the potential for negative landscape / townscape and visual effects. Opportunities to avoid, reduce or remediate these have been taken wherever practicable, and landscape measures are integrated within the design as far as possible. It should be noted, that wherever practicable, the Proposed Scheme proposes improvements of key locations of the townscape / streetscape.

The permanent loss of property / garden areas will result in a permanently adjusted arrangement and reduced area. The measures proposed to avoid or reduce negative landscape (townscape) and visual impacts during the Operational Phase will include:

- Where existing trees, hedges, and / or plants are to be removed from temporary land take areas, Where feasible replacement trees, hedges and /or plants will be provided and negative effects will be reduced as these mature over the long-term;
- The Proposed Scheme will provide for the planting of new street trees, both to mitigate the removal of trees and provide an overall improvement of the streetscape environment, where practical;
- All impacted property boundaries will be reinstated The Proposed Scheme includes for replacement of disturbed boundaries, reinstatement of the Construction Compound, return of temporary acquisition areas, and for additional tree and other planting where possible along the Proposed Scheme.

With the implementation of the proposed mitigation measures, it is expected that, during the Operational Phase, there will be Positive, Moderate / Significant, Long-Term impacts on the townscape areas from Botanic Avenue to Granby Row and Positive, Moderate, Long Term impacts from Northwood Avenue to Shantalla Road and Shantalla Road to Botanic Avenue.

There will be a Moderate, Negative, Long Term impacts on Thatched Cottage, Collinstown, Swords Road and the River Tolka Conservation Area. On residential properties in permanent acquisition, there will be Negative,

Moderate, Long- Term impacts. There will be Positive Moderate, Long-Term impacts on Amenity Designations and Residential Conservation Areas along the Proposed Scheme.

8.13 Waste & Resources

The 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.

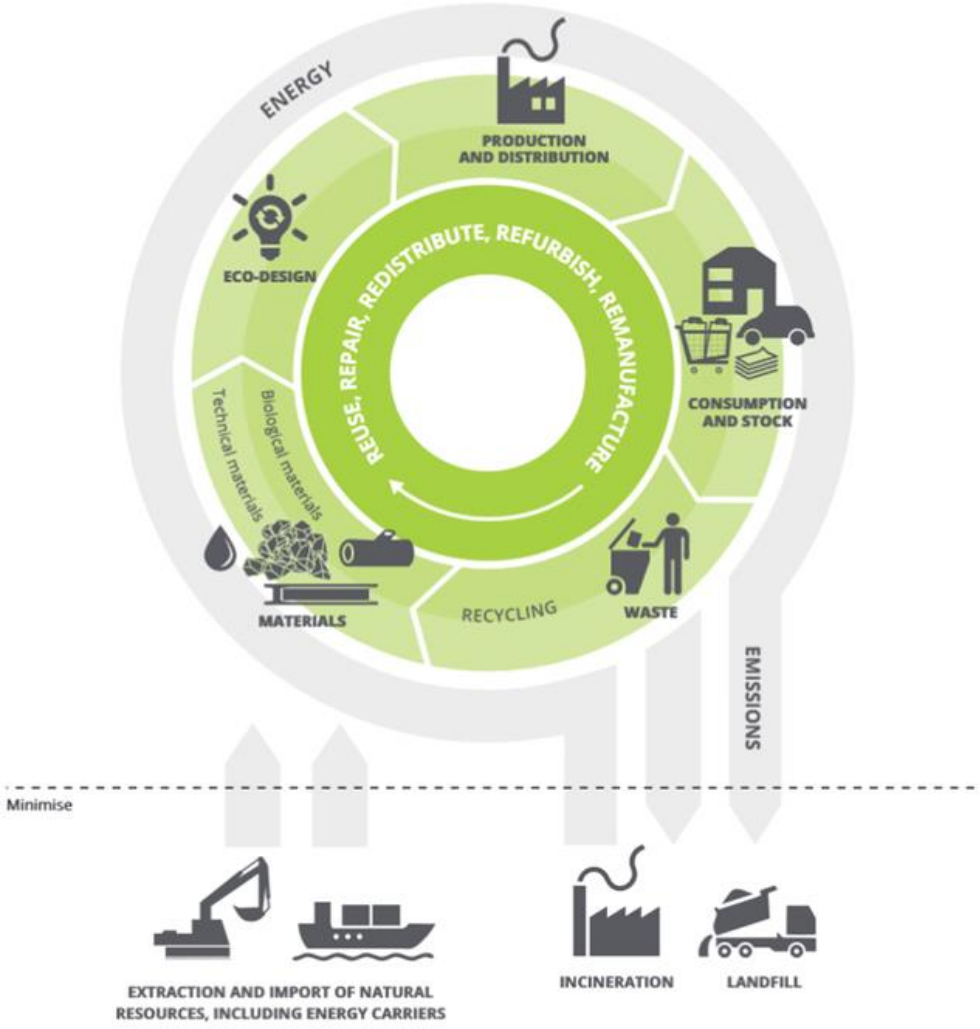

Image 8-2 The Circular Economy Model (Source: Circular Economy in Europe: Developing the knowledge base (European Environment Agency (EEA) 2016)

In Ireland, the most recently available published data records that 8.2 million tonnes of construction and demolition waste was generated in 2020. This represented a decrease of 0.6 million tonnes from 2019. Of this waste, 7.0 million tonnes was comprised of soil and stones and these make up 84% of the current construction and demolition 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;
- Removal of buildings and retaining walls;
- Removal of street furniture, including traffic lights and bus stops, and landscaping works;
- Boundary walls, fences and gates as required;
- Minor utility diversions and / or protections as 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 implementing a Construction and Demolition Resource and Waste Management Plan.

Approximately 2,250 tonnes of demolition waste will be generated as a result of the Proposed Scheme, which is equivalent to 0.02% of the C&D waste management baseline in the Eastern-Midlands Waste Region. 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 27,000 tonnes. and is equivalent to 1.4% of the C&D waste management baseline for the Eastern-Midlands Waste Region. There is potential for incorporating reused aggregates in the Proposed Scheme, and this will be done where practicable. In addition, where practicable 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, compared to the Do Nothing scenario, by approximately 6,000 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, rail 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:

- ESB 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 traffic signal ducting; and
- The Aviation Fuel Pipeline between Dublin Port and Dublin Airport (not yet fully constructed at the time of preparation of this EIAR).

The Proposed Scheme interacts with several pieces of major infrastructure, namely two railway lines, the Royal Canal and the Luas Green Line.

Within the site of the Proposed Scheme, material is only 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:

- 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;
- Construction Compounds will require a water supply for welfare facilities and spraying to prevent dust;
- Construction Compounds will require telecommunications access;
- The diversion of electricity lines in areas where there will be interfaces 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;
- 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 have been accounted for in the overall design of the Proposed Scheme.

All possible precautions will be taken to avoid unplanned disruptions to any infrastructure or 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 Environmental Impact Assessment Report.

Consultation has taken place with the major utility companies, and the appointed contractor will continue to consult 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 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 construction 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; 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 potential impacts was developed for the Construction and Operational Phases of the Proposed Scheme. This register assumed a worst-case scenario, before any mitigation measures or emergency plans would be put in place to reduce the likelihood and potential impact of any major accidents and / or disasters.

Risks are rated by multiplying the likelihood rating (likelihood of a risk happening which ranges from extremely unlikely to very likely) with the consequence rating (level of consequences if a major accident 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 and 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 pollution occurring to a watercourse or groundwater, most notably associated with the release of fine sediments during construction works; and
- Risk of spread of non-native invasive species during construction works, particularly during site clearance.

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

A review of Upper Tier and Lower Tier Seveso sites in the Greater Dublin Area and their respective distances from the Proposed Scheme was undertaken. The Proposed Scheme falls within the consultation zone for one Seveso site. A review of the traffic impact assessment was undertaken to determine the potential for impacts on emergency response accesses to Seveso sites from their respective nearest hospital and fire stations. No significant impacts on emergency response times are anticipated.

Appropriate mitigation measures will be implemented during the Construction Phase. Once these mitigation measures are applied, there are no remaining identified incidents or major accidents and / or disasters 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 Impact 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;
- National Transport Authority website – for details of major transport programmes. This included a review of the NTA's Transport Strategy for the Greater Dublin Area 2016 – 2035;
- 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.

For the Construction Phase, 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 cumulative impacts on the wider road network, including local and residential roads. 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. No likely significant cumulative effects relating to traffic and transport are predicted, over and above the effects of the Proposed Scheme assessed in isolation.

The Biodiversity assessment identified potential for significant residual cumulative effects with regard disturbance and displacement of non-SCI breeding birds during construction and habitat loss for some projects in conjunction with the Proposed Scheme. However, these cumulative effects will be at the local geographic scale and short-term.

The Landscape (Townscape) and Visual found there will be potential for localised, moderate, temporary in-combination indirect townscape and visual cumulative effects to occur with other projects should the construction periods either overlap or follow on within a short timeframe with the Proposed Scheme. Effects would be reduced or negligible if this is not the case. In most cases the potential impacts are likely to be localised and contained, due to enclosing effect of the surrounding built form.

For the MetroLink project, should the construction periods either overlap or follow on within a short timeframe with the Proposed Scheme, there is potential for localised, significant, temporary cumulative townscape/visual effects due to the parallel nature of this project and the northern end of the Proposed Scheme. However, these effects would be limited to any above ground works associated with construction of station access points for MetroLink. If no nearby above ground works, cumulative effects would be not significant.

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 Phase impacts, the assessments assume all 12 proposed Bus Corridor Schemes would be operational, along with other identified projects and Greater Dublin Area 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 Climate Action Plan 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 greenhouse gas emissions.

Based on the analysis outlined in the assessment, 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 greenhouse gas 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. It is concluded that, cumulatively, the Core Bus Corridor Infrastructure Works will make a significant contribution to carbon reduction.

The only other significant operational cumulative impacts identified over and above the standalone scheme relate to human health. It was assessed that the proposals for the cycle network, the DART+ Coastal South project, MetroLink, and the other 11 Core Bus Corridor schemes and the Proposed Scheme are complementary and could have a cumulative beneficial effect by encouraging active travel and increased use of public transport through offering a choice of routes. Due to the substantial size of overall population with the opportunity to benefit from the proposals, the effect is assessed as Positive, Very Significant and Long-Term for health.

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 GDA 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: www.swordsscheme.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: www.swordsscheme.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.

The Board 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.