Contents

1. Introduction

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the Blanchardstown to City Centre Core Bus Corridor Scheme (referred to as the Proposed Scheme throughout this NTS). The Proposed Scheme will support integrated sustainable transport use 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 Core Bus Corridor has an overall length of approximately 10.9km and will commence at Junction 3 (Blanchardstown / Mulhuddart) southbound off-slip from the N3. The Proposed Scheme proceeds along the R121 Blanchardstown Road South into the Blanchardstown Shopping Centre. From a new terminus to the north-west of Blanchardstown Shopping Centre the Proposed Scheme is routed onto the N3 Navan Road via the Snugborough Road junction and will follow the N3 and Navan Road as far as the junction with the Old Cabra Road. From here, the Proposed Scheme will be routed along Old Cabra Road, Prussia Street, Manor Street and Stoneybatter to the junction with King Street North. The Proposed Scheme will proceed via Blackhall Place as far as the junction with Ellis Quay, where it will join the prevailing traffic management regime on the North Quays. At the Stoneybatter / Brunswick Street North junction, cyclists proceed along Brunswick Street North, George's Lane and Queen Street as far as Ellis Quay/Arran Quay.

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.

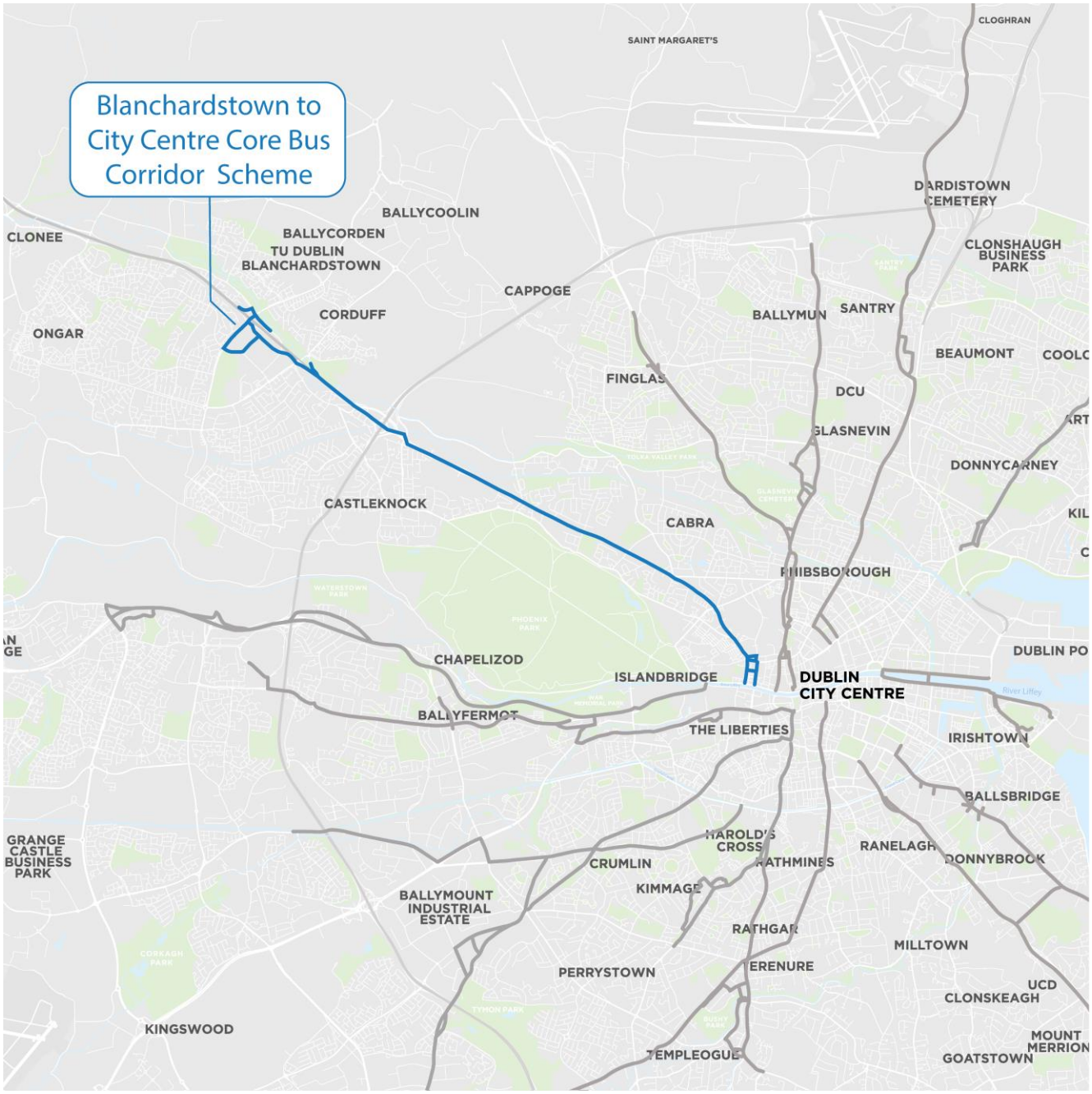

Image 1.1: Route of the Proposed Scheme

The Proposed Scheme would significantly enhance travel by public transport by providing bus priority as well as improved pedestrian and cycling infrastructure. Currently this access corridor is characterised by traffic congestion and while there are existing bus lanes on some of the route, buses and cyclists are competing for space with general traffic for part 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 provision of dedicated cycling infrastructure along the Proposed Scheme, will make cycling trips safer and more attractive. In this regard, the Proposed Scheme delivers substantial elements of the National Transport

Authority (NTA) Greater Dublin Area Cycle Network Plan (hereinafter 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, contributing towards the development of a comprehensive cycling network for Dublin.

The Proposed Scheme will see an overall increase in bus priority and segregated and non-segregated cycling facilities. The scheme will also provide improved pedestrian crossing facilities along the route, with an increase in the number of signalised crossing points, and the provision of raised tables at non-signalised junctions where practicable.

Several urban realm upgrades, including widened footpaths, high quality hard and soft landscaping and street furniture would be provided in areas of high activity to contribute towards a safer, more attractive environment for pedestrians. Within the Blanchardstown Shopping Centre site, the new Bus Interchange provides a public realm opportunity between the existing shopping centre and the northern retail outlets with strong pedestrian connections to and from both. The new Bus Interchange will establish an accessible and attractive location at Blanchardstown Shopping Centre with convenient access to and from public transport services.

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

The Proposed Scheme is one of 12 schemes to be delivered under the BusConnects Dublin - Core Bus Corridors Infrastructure Works (hereinafter 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 NTA's Transport Strategy for the Greater Dublin Area 2016-2035 (referred to as the GDA Transport Strategy) (NTA 2016) and the draft Strategy (2022-2042).

1.1 Aims and Objectives

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

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

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

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

The outcomes achieved from delivering the Proposed Scheme will be:

- An attractive, resilient, equitable public transport network better connecting communities and improving access to work, education and social activity;
- To facilitiate a transport infrastructure network that prioritises walking and cycling and a mode 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 (NTA)

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 the Dublin Transport Authority Act 2008 (as amended) (the "2008 Act").

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

2. Environmental Impacts Assessment Process

2.1 EIA Process

Environmental Impact Assessment 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 effects which may rise during the Construction and Operational Phases 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 do not currently 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 needs of our growing urban centres and connect 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 Greater Dublin Area Transport Strategy

The Greater Dublin Area Transport Strategy 2016 - 2035 (referred to as the GDA Transport Strategy) is an essential component for the orderly development of the Greater Dublin Area (GDA) over the next 20 years. The purpose and primary objective of the GDA Transport Strategy is *'to contribute to the economic, social and cultural progress of the Greater Dublin Area by providing for the efficient, effective and sustainable movement of people and goods'.*

The Proposed Scheme is needed to support the implementation of the GDA Transport Strategy in regard to improving the pedestrian 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.

The Proposed Scheme supports the implementation of the GDA 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.

As part of the GDA Transport Strategy the Core Bus Network is to be developed to achieve a continuous priority for bus movement on sections of the Core Bus Network within the Metropolitan area. This is to be achieved through enhanced bus lane provisions and the removal of delays along the routes, and thus enabling the bus to move more quickly than cars along these routes.

The Proposed Scheme is needed to support the GDA Transport Strategy in so far as it will provide infrastructure required to facilitate '*a continuous priority for bus movement on the portions of the Core Bus network within the Metropolitan area*.' The Proposed Scheme is needed to help realise the objectives of the GDA Transport Strategy by making the bus a faster option for commuters than car-based transport.

The NTA prepared the Core Bus Network Report for the Dublin Metropolitan Area in 2015, which identified those routes upon 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. The Core Bus Network is defined as a set of primary orbital and radial bus corridors which operate between the larger settlement centres in the Dublin Metropolitan Area.

The development and implementation of priority infrastructure on the Core Bus Network is needed to ensure that delays are minimised, reliability is improved and use of buses is made more attractive.

There are four main bus corridors in the north-west Dublin area, the Finglas, Ballymun, Blanchardstown and Ongar corridors. These corridors currently provide a small number of short stretches of outbound bus lane and intermittent inbound bus lanes along the N3 Navan Road from the M50 to the Liffey Quays, with several significant gaps, most notable through Prussia Street / Manor Street / Stoneybatter. The N3 Navan Road inbound corridor has reasonable bus priority in sections. However, there is very limited bus priority south of the junction with Cabra Road. Overall, the Core Bus Network Report noted that the existing N3 Navan Road bus corridor has limited quantity of bus priority infrastructure, whereas Blanchardstown has large sections of good quality inbound and outbound infrastructure.

Based on the need to address the resulting service deficiencies (lack of bus priority and associated journey time reliability for destinations including Blanchardstown, Connolly Hospital and Mater Hospital) for a high level of scheduled bus services already operating along the entire corridor, the Core Bus network study included a recommended route from Blanchardstown to the City Centre.

The Proposed Scheme 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 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 GDA Strategy 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 Emerging Preferred Route (EPR) and two in relation to the Preferred Route Option (PRO)), 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 robust environmental baseline for the Proposed Scheme and its surroundings;
- The identification, early in the process, of specific concerns and issues relating to the Proposed Scheme so that they could be appropriately accounted for in the design and assessment scope; and
- Ensuring the appropriate involvement of the public and stakeholders in the design and assessment process.

These consultations are briefly described below.

4.1 EPR Option Consultation

The first round of public consultation carried out was based on the EPR and this ran from the 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 EPR 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 PRO 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 PRO Consultations

The PRO non-statutory public consultation took place from 4 March 2020 to 17 April 2020. The public were invited to make written submissions in relation to the published proposals to the BusConnects Infrastructure team either through an online form, by email or by post. Due to the COVID-19 pandemic all further planned events scheduled after 12 March were cancelled. 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 PRO 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 PRO 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 PRO 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 BusConnects Infrastructure team undertook consultation during the preparation/ development of the EIAR with prescribed bodies and relevant non-statutory consultees.

During the development of the EIAR, prescribed bodies (including the Department of Communications, Climate Action and the Environment, the Department of Transport, Dublin City Council, Fingal County Council, 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, where appropriate.

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 March 2020 and December 2020). A letter drop was also carried out in summer 2020 to request access to properties to undertake more detailed surveys. Additional letters were sent to affected landowners in July 2021 offering further engagement. Over the course of the engagements, affected property owners have had the opportunity to discuss different aspects of the Proposed Scheme with the design team. Follow-up conversations have been facilitated as a result of these letters on request. In addition, a further attempt was made to contact those occupiers that had yet to make contact by visiting each property during September 2021. Where no one answered the door, a letter was placed through the letterbox again requesting the occupiers to contact the NTA.

4.5 Consultation with Local Residents and Business Groups

Throughout the design development of the Proposed Scheme from the initiation of the first non-statutory public consultation in November 2019 the NTA facilitated consultation on request with 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, and its associated Strategic Environmental Assessment, considered several strategic options relevant to the Proposed Scheme.

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.

The Proposed Scheme aligns generally with part of Corridor B in the GDA Transport Strategy which extends from the core City Centre area through to Blanchardstown, Dublin's most populous suburb and the location of strategic employment zones at Ballycoolin, Damastown and Blanchardstown town centre, and onwards towards Navan in County Meath. The Proposed Scheme is within the Inner Metropolitan segment traversing through largely low to medium density suburban areas.

Through the work undertaken in the preparation of the GDA Transport Strategy, including its supporting studies, various alternatives to deal with the transport needs along the broader corridor which are intended to be partly 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 has concluded that new heavy rail and light rail/metro alternatives would not be justified by the predicted level of demand.

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

5.2 Route Alternatives

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

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

1. A **Route Options Assessment** (Blanchardstown Town Centre to the Liffey Quays (Ellis Quay) CBC Route Options Assessment (AECOM/ROD, 2018)) was concluded in 2018, setting out the initial route options and concluding with the identification of an Emerging Preferred Route;
2. A first round of non-statutory **Public Consultation** was undertaken on the Emerging Preferred Route from 14 November 2018 to 29 March 2019;
3. Development of **Draft Preferred Route Option** (April 2019 to March 2020). Informed by feedback from the first round of public consultation, stakeholder and community engagement and the availability of additional design information, the design of the Emerging Preferred Route evolved with further alternatives considered;
4. A second round of non-statutory **Public Consultation** was undertaken on the Draft Preferred Route Option from 4 March 2020 to 17 April 2020. Due to the introduction of COVID-19 restrictions, some planned in-person information events were cancelled, leading to a decision to hold a third consultation later in the year;
5. Further development of an updated **Draft Preferred Route Option** was undertaken subsequent to the second round of public consultation, which took account of submissions received, continuing stakeholder engagement and additional design information;
6. A third round of non-statutory **Public Consultation** was undertaken on the updated Draft Preferred Route Option from 04 November 2020 to 16 December 2020; and
7. Finalisation of **Preferred Route Option**. Informed by feedback from the overall public consultation process, continuing stakeholder engagement and the availability of additional design information, the Preferred Route Option, being the Proposed Scheme, was finalised.

The initial route alternatives considered covered a network of roads between Blanchardstown and Ellis Quay. 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 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:

> *'The Blanchardstown to City Centre Core Bus Corridor (CBC) commences on the north side of the South Blanchardstown Road junction with the N3. The corridor proceeds on the R121 Blanchardstown Road South into the Blanchardstown Shopping Centre. From a new terminus to the north-west of Blanchardstown Shopping Centre the CBC is routed onto the N3 Navan Road via the Snugborough Road junction, and follows the N3 and Navan Road as far as the junction with the Old Cabra Road. From here the CBC is routed along Old Cabra Road, Prussia Street and Manor Street to the junction with North Brunswick Street. The CBC is then routed via Blackhall Place as far as the junction with Ellis Quay and Arran Quay, where it will join the prevailing traffic management regime on the North Quays. Priority for buses is provided along the entire route, consisting primarily of dedicated bus lanes in both directions, with alternative measures proposed at particularly constrained locations.'*

5.3 Design Alternatives

Following the completion of the public consultation process in relation to the EPR, various amendments were made to the scheme proposals to address some of the issues raised in submissions, including incorporating suggestions and recommendations from residents, community groups, business, elected representatives, and

stakeholders, and / or arising from the availability of additional information. These amendments were incorporated into the designs and informed a Draft PRO.

Amongst the alternative options considered during the development of the Draft PRO are the following:

- Between R147 Navan Road/Ashtown Road Junction and Navan Road/Ratoath Road Junction, two options were considered:
    - The first option would provide a four lane carriageway with two bus lanes and two general traffic lanes in both directions with one-way cycle tracks; and
    - The second option would provide a four-lane carriageway, with intermittent three-lane sections on two short sections of the route. The single lane arrangement would be controlled by bus priority signals. One way cycle tracks are proposed on both sides of the road adjacent to the footpath.

  The first option significantly outperforms the second option under the Economy, Integration and Safety criteria. This option bests aligns with the objectives for the Proposed Scheme and provides fully segregated bus and cycle facilities in both directions while maintaining access for general traffic. Whilst the first option has a higher capital cost, it performs significantly better in respect of transport quality and reliability when compared to the second option.

  In terms of environment sub-criteria, both options are considered neutral in terms of potential impacts on Archaeology and Cultural Heritage, Architectural Heritage, Flora and Fauna, Soils, Geology and Hydrology, Air Quality, Noise and Vibration, while the second option performs better under Landscape and Visual as the first option requires more land acquisition.

  The first option is the preferred option as it is considered to provide segregated bus priority, aligns with the GDA Cycle Network Plan and meets the desirable Proposed Scheme cross-section, notwithstanding that it has a disadvantage in terms of environmental sub-criterion Landscape and Visual.

- Between Navan Road/Ratoath Road and Prussia Street (Park Shopping Centre), two options were considered:
    - The first option would introduce a bus gate at the northern end of Old Cabra Road (at its junction with Navan Road), and a section of northbound bus lane on Old Cabra Road south of Glenbeigh Road – which would effectively remove the ability of through-traffic to travel between Stoneybatter and Navan Road in both directions along the Old Cabra Road. Cycle-lanes in each direction are proposed on Old Cabra Road from Navan Road to Prussia Street; and
    - The second option would introduce a bus gate at the northern end of Old Cabra Road and a second bus gate north of Cabra Drive which would restrict general traffic through-route. A two-way cycle-track would be provided on the eastern side of Old Cabra Road from Navan Road to Prussia Street.

  In terms of environment, the first option performs better in terms of landscape and visual as it requires less land take when compared to the second option. Furthermore, the first option retains a tree line in the central reserve at the Ratoath Road junction and has a greater scope for public realm improvements at this location which is considered to be an urban focal point.

  In addition to the environmental benefits, the first option outperforms the second option in terms of Economy and Cycle Integration. The second option has a greater capital cost option due to significant land acquisition and infrastructure costs required to deliver a pedestrian bridge over the railway at Old Cabra Road. The first option also aligns with the cycle network. Overall, the first option was identified as the preferred option to be taken forward.

Furthermore, whilst there were no major scheme design changes following the Draft PRO, the Proposed Scheme includes specific localised design alternatives which were not identified in the Draft PRO. For example, the Proposed Scheme includes new bus stop locations on the N3 with new pedestrian ramp access between the N3 and Mill Road which will enhance the public transport access for pedestrians along Mill Road, to Edmund Rice College and Connolly Hospital.

To the north of the N3, the Draft PRO identified pedestrian ramps to the east of Mill Road. However, following design optioneering by the BusConnects Infrastructure team, the pedestrian ramps were relocated from east of

Mill Road to the west of Mill Road which is considered to have less dense woodland and provides a larger distance between the Proposed Scheme and the River Tolka.

The assessment of design 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 10.9km and will commence at Junction 3 (Blanchardstown / Mulhuddart) southbound off-slip from the N3. The Proposed Scheme proceeds along the R121 Blanchardstown Road South into the Blanchardstown Shopping Centre. From a new terminus to the north-west of Blanchardstown Shopping Centre the Proposed Scheme is routed onto the N3 Navan Road via the Snugborough Road junction and will follow the N3 and Navan Road as far as the junction with the Old Cabra Road. From here, the Proposed Scheme will be routed along Old Cabra Road, Prussia Street, Manor Street and Stoneybatter to the junction with King Street North. The Proposed Scheme will proceed via Blackhall Place as far as the junction with Ellis Quay, where it will join the prevailing traffic management regime on the North Quays. At the Stoneybatter / Brunswick Street North junction, cyclists proceed along Brunswick Street North, George's Lane and Queen Street as far as Ellis Quay/Arran Quay.

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

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

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

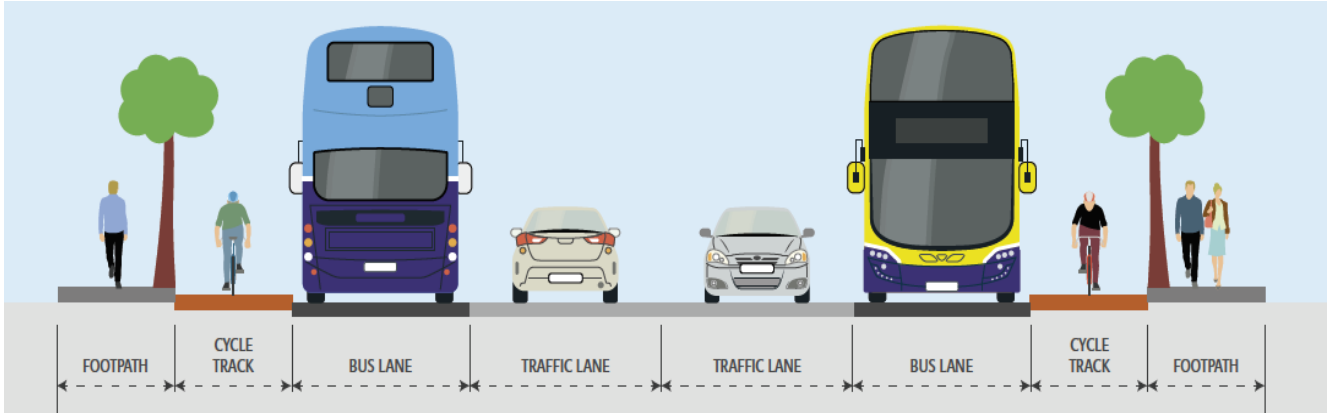

Image 6.1: Typical BusConnects Road Layout

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

- The number of pedestrian signal crossings will increase by 62% from 77 to 125 as a result of the Proposed Scheme;
- The proportion of segregated cycle facilities will increase from 9% on the existing corridor to 78% on the Proposed Scheme; and
- The proportion of the route having bus priority measures will increase from 25% on the existing corridor to 97% on the Proposed Scheme.

The Proposed Scheme is described in the following five geographical sections as follows:

- Section 1: N3 Blanchardstown Junction to Snugborough Road;
- Section 2: Snugborough Road to N3 / M50 Junction;
- Section 3: N3 / M50 Junction to Navan Road / Ashtown Road Junction;
- Section 4: Navan Road / Ashtown Road junction to Navan Road / Old Cabra Road Junction; and
- Section 5: Navan Road / Old Cabra Road junction to Ellis Quay.

6.1 Section 1: N3 Blanchardstown Junction to Snugborough Road

The Proposed Scheme will commence at Junction 3 (Blanchardstown / Mulhuddart) eastbound off-slip from the N3. It is proposed to alter the existing off-slip road from the N3, from two general traffic lanes to one general traffic lane and one bus lane. At the junction of Blanchardstown Road North / Old Navan Road, it is proposed to introduce a protected style junction to enhance safety for cyclists. Proposals for the N3 on-slip junction, immediately to the south of this junction, include for the provision of a left turn filter lane with the northbound cycle track being moved to alongside the verge.

In the vicinity of the N3 overbridge, cycle tracks will be relocated alongside footpaths, which cross adjacent to pedestrian crossings at slip-roads to avoid conflict with vehicular traffic.

After crossing the N3 overbridge, the Proposed Scheme will provide a westbound bus lane alongside a general traffic lane along Blanchardstown Road South towards the Blanchardstown Shopping Centre via the Blakestown Way junction. Two eastbound general traffic lanes will also be provided along Blanchardstown Road South. A cycle track will be provided along each side of Blanchardstown Road South. A new retaining wall will be required between the cycle track / footpath and the shopping centre, extending from the westbound bus stop to the N3 off-slip junction and further south towards the Crowne Plaza hotel. The existing small retaining wall and railing between Whitestown Grove and Blanchardstown Road South will be replaced due to a reduction in footpath levels. The new wall and railing will match existing.

A new bus layover ‘layby’ and driver welfare facility will be located north of the shopping centre on Blanchardstown Road South.

A new access, in the form of a signalised junction, will be provided from Blanchardstown Road South into the northern car park at Blanchardstown Shopping Centre.

The Blanchardstown Road South / Blakestown Way junction will be converted from a roundabout to a signal controlled junction. The proposals for the road linking the Blanchardstown Road South / Blakestown Way junction to the western junction of the Bus Interchange include a bus lane and general traffic lane in each direction, with an additional left turn filter lane into the shopping centre. A single cycle track along the eastern side of this road becomes a two-way cycle track on the approach to the shopping centre. The area adjacent to the western junction of the Bus Interchange will facilitate 35 bicycle stands.

The existing roundabouts in the vicinity of the Blanchardstown Shopping Centre will be converted to signalised junctions.

Within the Blanchardstown Shopping Centre site, the existing bus laydown will be upgraded to a more formal Bus Interchange with improved passenger waiting facilities. The new Bus Interchange will include six bays for boarding / alighting and an additional seven alighting bays for buses. The interchange will also include six bus shelters with roof canopies of two different heights providing shelter for external circulation.

An existing entrance into the northern car park at the Shopping Centre will be removed as a result of the proposed Bus Interchange.

A two-way cycle track is proposed and will continue along the southern side of the new Bus Interchange.

The existing northbound bus lane on the northern corner of Blanchardstown Shopping Centre site (adjacent to the Crowne Plaza Hotel) will be maintained. This will merge with a new northbound bus lane on the N3 off-slip

leading to Blanchardstown Road South. The Proposed Scheme will also provide a two-way cycle track adjacent to the northbound bus lane.

A new bus stop for inter-urban buses will be provided on the Northbound N3 off-slip adjacent to the Crowne Plaza Hotel.

Between the junction adjacent to the Crowne Plaza Hotel entrance and the Liberty Insurance building, a bus lane and general traffic lane will be provided in each direction with a two-way cycle track along the southern edge of the carriageway. Retaining walls are required between the southern footpath and the adjacent car park. New bus stops will be provided in each direction in this area, including modification of an existing bus stop layby to accommodate inter-urban buses.

The existing roundabout junction adjacent to the Liberty Insurance Building on the L3020 will be modified to a fully signalised crossroads junction, allowing for bus lanes in both directions each side of this junction. The road between the existing junction and the tie-in with the Snugborough Interchange Upgrade scheme will be widened to accommodate improved cycling, pedestrian and bus stop facilities. A new bus layby (for inter-urban buses) will be provided on the westbound carriageway on the L3020, which will require a short section of retaining wall to be constructed to the rear of the proposed cycle track at this location.

Following this Section, it is intended to route the bus lane through the Snugborough Road junction. The Proposed Scheme will be coordinated with the Snugborough Interchange Upgrade scheme which is currently being undertaken by Fingal County Council (FCC). The Snugborough Interchange Upgrade scheme involves the widening of the Snugborough Road bridge and the L3020 to accommodate additional bus lanes and general traffic lanes, and new cycle tracks.

6.2 Section 2: Snugborough Road to N3 / M50 Junction

This Section of the Proposed Scheme will commence at the tie-in with the Snugborough Junction Upgrade scheme on the N3 citybound slip-road. A bus lane will be provided along the N3 Snugborough Road junction on-slip and off-slip ramps. The Proposed Scheme will provide bus lanes on the N3 corridor in both directions which will require the widening of the BR01 River Tolka Bridge beneath the N3 off-slip and also BR02 Mill Road Bridge.

An emergency refuge layby and two maintenance laybys will be provided alongside the outbound carriageway and two maintenance laybys will be provided alongside the inbound carriageway of the N3.

On the N3 inbound carriageway, the Proposed Scheme will relocate the overhead variable messaging sign, modify an existing overhead sign gantry, provide a new overhead sign gantry and remove an existing overhead sign gantry. On the N3 outbound carriageway, the Proposed Scheme will provide two new overhead sign gantries.

Additional inbound and outbound bus stops will be provided on the N3 with pedestrian access to and from Mill Road. Access from Mill Road to the new bus stops will be via pedestrian ramps and steps. Retaining walls will be constructed to support the pedestrian ramps and steps.

Retaining walls will be required at the back of verge along sections of both the inbound and outbound N3 carriageways. This includes a retaining wall to the rear of a new bus stop layby on the inbound carriageway between River Road and the M50 roundabout. A section of new retaining wall will also be required between the inbound and outbound N3 carriageways immediately to the west of the M50 roundabout.

Existing noise barriers will be relocated along the outbound carriageway at the back of the verge.

The speed limit will be 60km/h for the inbound and outbound bus lane of the N3 carriageway section.

The inbound bus lane will be directed onto the Connolly Hospital off-slip road and onto the N3 Navan Road.

The Proposed Scheme will provide a bus lane in both the eastbound and westbound directions on the gyratory over the M50 (Junction 6).

6.3 Section 3: N3 / M50 Junction to Navan Road / Ashtown Road Junction

It is intended to construct a new section of inbound bus lane between the eastern side of the N3/M50 gyratory and the Auburn Avenue junction.

New bus stops will be provided immediately to the east of Auburn Avenue junction with the R147 Navan Road, along both the inbound and outbound carriageways. A short retaining wall will be provided to the rear of the outbound bus stop.

A new bus lane will operate along the existing inner lane of the inbound and outbound R147 Navan Road. The bus lane will terminate on the inbound carriageway between Morgan Place and the Navan Parkway off-slip junction which will allow left turning vehicles to enter the nearside lane to leave the main carriageway. At the Navan Road Parkway junction, buses will be routed off the mainline and along the on and off slip roads (widened to carry bus lanes) to the junction overbridge.

As part of measures to improve road safety, the inbound carriageway cross-section will be reduced from four general traffic lanes and a bus lane to two general traffic lanes and a bus lane before the existing pedestrian crossing west of Morgan Place. This will reduce potential conflict in vehicle movements, between Morgan Place and the Navan Parkway off-slip junction.

Commensurate with the suburban nature of Navan Road between Auburn Avenue and Phoenix Park Avenue junctions, a consistent 60kph speed limit will be implemented, to reflect the presence of bus stops and pedestrian crossings, and the need for general traffic to carry out merging and weaving actions to access side roads. East of Phoenix Park Avenue junction, Navan Road enters an urbanised environment (including pedestrian crossings), a 50km/h speed limit will be implemented, which is consistent with the speed limit on Navan Road east of Ashtown Road. The existing 50km/h speed limit along the Navan Parkway on and off-slip ramps will remain in place, with their proposed extents adjusted slightly.

Due to a proposed change in lane positions on Navan Road between Phoenix Park Avenue and Auburn Avenue, the three existing overhead sign gantries on the outbound carriageway of the R147 will be modified.

New bus stop lay-bys for inter-urban buses will be provided on both the inbound and outbound Navan Parkway off-slip ramps, with a new inline bus stop located on the inbound on-slip ramp, replacing the existing inline bus stop located on the inbound off-slip ramp. A retaining wall will be required to the rear of the outbound bus stop lay-by. New inbound and outbound bus stop lay-bys and relocated bus stops will also be provided adjacent to Phoenix Park Avenue junction.

The Proposed Scheme will provide Quiet Street Treatment for cyclists on Castleknock Manor to integrate with secondary route 4A of the Greater Dublin Area (GDA) Cycle Network Plan. The Auburn Avenue / Castleknock Manor roundabout will be modified to provide enhanced pedestrian and cyclist crossing facilities.

Between Castleknock Manor and Ashtown Road junction, a two-way cycle track along the outer edge of the westbound (outbound) carriageway will be provided and will provide good connectivity for cyclists from existing and planned residential areas.

At the Ashtown Road junction, the two-way cycle track will be terminated west of the junction, and will transition to a one-way cycle track on each side of the Navan Road carriageway east of the junction.

The two left-in / left-out junctions on opposite sides of Navan Road at Phoenix Park Avenue will be amended to operate as a staggered signal-controlled junction, which will allow left and right turns out of the side roads, left turns into the side roads and right-turns from the west into Phoenix Park Avenue.

The central median between Phoenix Park Avenue junction and Ashtown Road junction will be removed to provide additional space for footpath and cyclist facilities and landscaped verges.

At the Navan Road / Ashtown Road junction, the existing roundabout will be modified to a signal-controlled crossroads, with separate pedestrian and cyclist crossings.

The Blackhorse Avenue / Ashtown Gate Road junction, located to the south of the Ashtown Road junction, will be signalised to allow improved traffic management, and in particular to minimise use of side roads by through traffic.

6.4 Section 4: Navan Road / Ashtown Road junction to Navan Road / Old Cabra Road Junction

From Ashtown Road junction to the Navan Road / Old Cabra Road junction (also referred to as Ratoath Road junction), the Proposed Scheme will generally consist of a bus lane and general traffic lane in each direction, with one-way cycle tracks alongside the proposed inbound and outbound bus lanes. Permanent and temporary land take will be required from a number of properties, with the majority being residential, along this Section to accommodate these facilities. Boundary treatment will generally match existing.

Enhanced cyclist and pedestrian facilities will be provided at each junction along this Section of the Proposed Scheme.

Junction layouts will be amended to include the removal of the right turn filter lane from Navan Road (westbound) into Kempton Avenue and Ashtown Grove, although the right turn movement is permitted.

6.5 Section 5: Navan Road / Old Cabra Road junction to Ellis Quay

The Proposed Scheme will limit the use of Old Cabra Road to local access traffic, buses, taxis and cyclists as follows:

- No through traffic in the southbound direction at the northern end of Old Cabra Road (at its junction with Navan Road), except for buses, taxis and cyclists, which precludes general traffic from Navan Road travelling to Stoneybatter along Old Cabra Road;
- No through traffic in the northbound direction except for buses, taxis and cyclists, due to proposed introduction of a Bus Gate at the railway overbridge on the Old Cabra Road, which precludes general traffic from Stoneybatter and the North Circular Road from travelling along Old Cabra Road through to Navan Road. Local traffic in the northbound direction will have access as far as the Bus Gate.

On Old Cabra Road, the extent of the outbound bus lane will be limited to an approximate 110m section just south of the Navan Road junction.

Glenbeigh Road / Old Cabra Road junction will become a signal-controlled junction, with the introduction of toucan crossings on the Old Cabra Road.

The Proposed Scheme will provide two one-way cycle tracks on each side of Old Cabra Road. The traffic lanes, bicycle infrastructure and footpaths will be accommodated within the existing road bridge width over the Heuston Station / Connolly Station railway line.

To provide an alternative route for general traffic to and from the City Centre (along Cabra Road, North Circular Road, Infirmary Road and Conyngham Road), the Cabra Road / North Circular Road junction will be modified to allow right turns from Cabra Road to North Circular Road and left turns from North Circular Road onto Cabra Road.

On Prussia Street, between North Circular Road and the entrance to the Park Shopping Centre, the Proposed Scheme will provide:

- One southbound general traffic lane;
- One northbound ‘straight-ahead only’ lane for local traffic, taxis and buses travelling to Old Cabra Road; and
- One left turn lane from Prussia Street to North Circular Road;

Right turn movement from Prussia Street to North Circular Road will be removed.

The junction of Prussia Street and North Circular Road will be upgraded to a signalised junction to provide separate crossing facilities for cyclists and pedestrians, and to ban right turns from Prussia Street to minimise delay to buses travelling straight ahead (to Old Cabra Road).

Along Prussia Street, a traffic lane will be provided in both directions, carrying buses and local traffic only. St Joseph's Road will be modified to include a one-way section at its eastern end (i.e. one-way in an eastbound direction). This will restrict traffic using St Joseph's Road as a means of avoiding the Bus Gate at Prussia Street / Manor Street junction.

A short section of southbound cycle track will be provided on Prussia Street from its junction with North Circular Road before cyclists merge with general traffic just north of Park Shopping Centre. In the northbound direction, the cycle track will commence approximately 50m south of the junction with St Joseph's Road.

At the junction of Manor Street / Prussia Street with Aughrim Street, the Proposed Scheme will provide the following:

- In the northbound direction, a Bus Gate will be located on Prussia Street just north of Aughrim Street junction, such that all northbound general traffic will be required to turn left onto Aughrim Street;
- In the southbound direction, a Bus Gate will be located on Prussia Street / Manor Street just south of the Aughrim Street junction – and any general traffic travelling southbound on Prussia Street at this location will be required to turn right onto Aughrim Street;
- The loading bay outside Kavanagh's Public house will be retained.

The Manor Street / Prussia Street / Aughrim Street junction will be modified to include a signal-controlled cycle crossing, along with urban realm improvements at this junction The junction layout will include raised carriageway paving (i.e. raised table) to assist pedestrians crossing. The junction will include a southbound Bus Gate on Aughrim Street, preventing any general traffic from travelling from Aughrim Street onto Manor Street.

South of the Aughrim Street junction with Manor Street and Prussia Street, traffic signal controls will be included at the Manor Street / Kirwan Street / Manor Place staggered junction. The signal-controlled junction also includes a pedestrian crossing of Manor Street. Movements out of Kirwan Street will be restricted to left turn only, which will remain one-way westbound as at present. At the junction with Manor Street, Manor Place will be altered to a one-way street (i.e. one-way eastbound towards Manor Street), to limit use of Manor Place and Oxmantown Road by through traffic.

On Manor Street and Stoneybatter, the Proposed Scheme will provide two general traffic lanes and a cycle track in both directions to the junction with Brunswick Street North. The Proposed Scheme will provide protected parking bays on both sides of the road, and two loading bays.

In the northbound direction on Blackhall Place, the Proposed Scheme will provide a bus lane and a single general traffic lane, as far as the junction with King Street North. Northbound general traffic wishing to progress onto Manor Street will turn right onto King Street North (which will remain one-way eastbound), and then turn left onto George's Lane to travel westbound along Brunswick Street North.

The Proposed Scheme will include signal controlled priority for northbound buses at the Stoneybatter / Brunswick Street North junction.

The Proposed Scheme will provide a cycle track in each direction along Brunswick Street North.

The Proposed Scheme will allow for general traffic exiting Arbour Hill to turn right only at the Stoneybatter junction. General traffic into Arbour Hill will be from Manor Street direction or Brunswick Street North only.

A southbound general traffic lane will be provided along Stoneybatter between Brunswick Street North and King Street North, with general traffic being required to turn left into King Street North as a result of a southbound Bus Gate at Blackhall Place / King Street North junction. Bus services will continue travelling straight ahead along a southbound bus lane on Blackhall Place. This matches the current situation.

A loading bay will be provided along the northern side of King Street North.

On Blackhall Place between Blackhall Street and Arran Quay, the carriageway arrangement will consist of a bus lane and general traffic lane in each direction.

On Blackhall Street, the road layout will be revised to include one lane for general traffic, a two-way cycle track, and angled parking.

George's Lane will have one northbound general traffic lane, with proposed new signal controls at the junction of Grangegorman Street Lower and Brunswick Street North.

Westbound general traffic from the City Centre on the eastern section of King Street North (east of George's Lane) will be restricted to left turns only, into Queen Street.

On Queen Street, the Proposed Scheme will provide two southbound general traffic lanes. From King Street North, the layout will reduce to one southbound general traffic lane from Blackhall Street to Ellis Quay / Arran Quay. The Proposed Scheme will provide a two-way cycle track on the eastern side of Queen Street from King Street North to Ellis Quay / Arran Quay.

Traffic management measures such as one-way streets and / or turn bans will be required to minimise traffic impacts on side roads due to diverted traffic (which may occur due to the priority given on the Proposed Scheme to pedestrians, cyclists and buses).

A short one-way northbound section will be required on Annamoe Road at its junction with Annamoe Terrace and on Charleville Road at its junction with North Circular Road.

No access is proposed from Phibsborough Road onto Phibsborough and Monck Place, along with the introduction of right turn bans onto Phibsborough Road.

A short one-way southbound section is also proposed at the northern end of Cowper Street, with Aughrim Place becoming one-way southbound. There is also a short one-way westbound section at the western end of Swilly Road.

7. Construction

The Construction Phase for the Proposed Scheme is anticipated to take approximately 24 months to complete. It will be constructed based on individual sectional completions that will individually have shorter durations typically ranging from one month to thirteen 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;
  - Air Quality Monitoring Station Relocation;
  - Set up of Construction Compounds;
  - Installation of temporary lighting; and
  - Demolition of items such as walls, gates, fencing, lighting poles and bus stops.
- Road and street upgrades, including:
  - Excavation of the road surface;
  - Implementation of pedestrian and cyclist safety measures;

    - Implementation of any road closures or diversions;
    - Works to cellars;
    - Adjustment or upgrades to drainage;
    - Realignment, upgrades, replacement or protection of utilities and services;
    - Construction of structures, including:
        - Tolka River Bridge widening;
        - Mill Road Bridge widening;
        - Pedestrian Ramps;
        - Gantries and Variable Message Signs;
        - Retaining Walls;
        - Bus Interchange and Bus Driver Welfare Facility; and
        - Relocation of existing noise barriers and existing adverting panels.
    - Construction of pavement, including general traffic carriageways, bus lanes, on-road cycle tracks, off-road cycle tracks, off-line bus stops, bus terminals, traffic islands, off-line parking and loading bays;
    - Construction of road furnishings (including street furniture, signage, lighting, bus stops (shelters, CCTV and information displays) and communication systems); and
    - Boundary treatment and 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 BL1: Old Navan Road;
- Construction Compound BL2: Junction 6, Castleknock, West of the M50; and
- Construction Compound BL3: R147 East of the M50.

Construction Compound BL1 will be located on an existing car park along the Old Navan Road, within Corduff Park, as shown in **Image 7.1**.

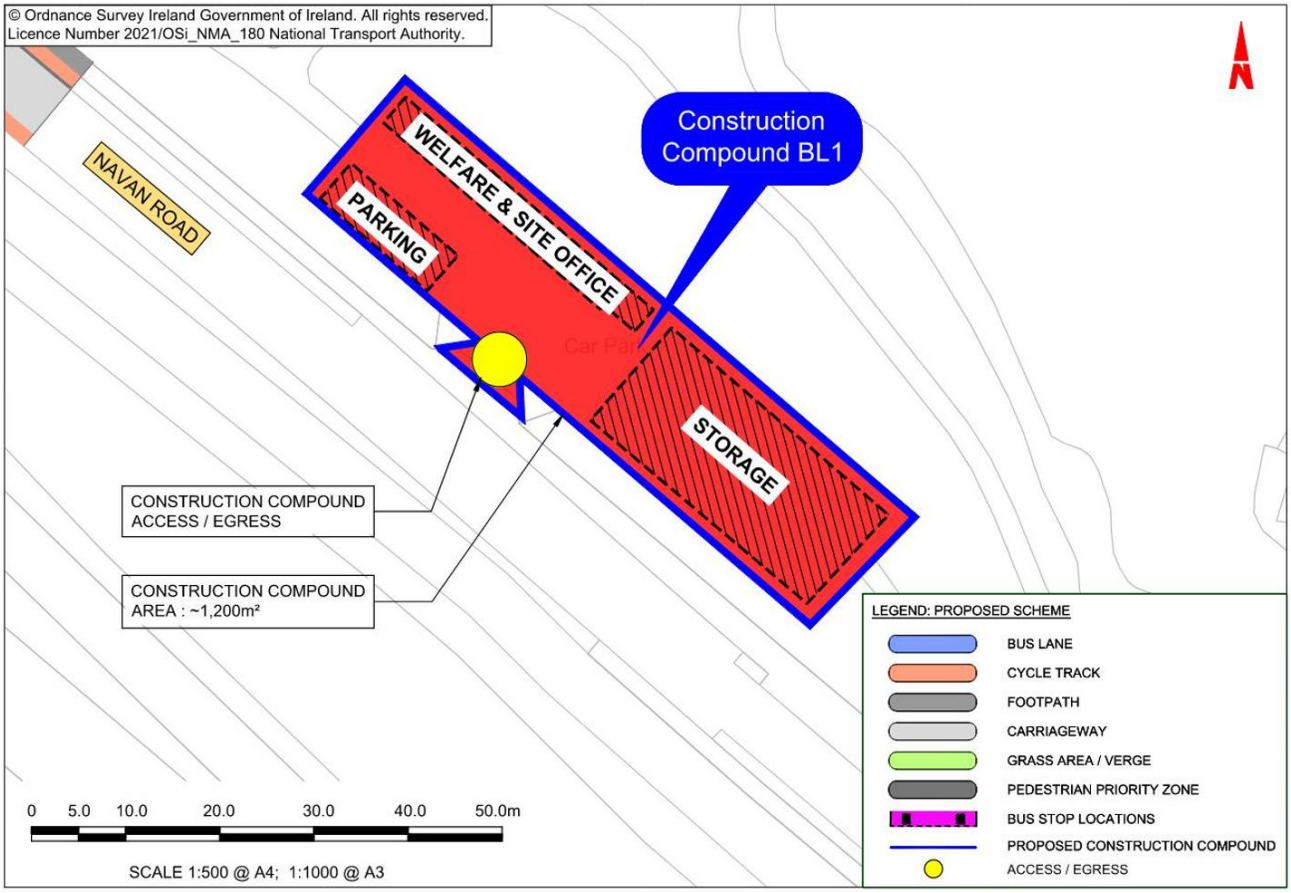

Image 7.1: Layout of Construction Compound BL1

Construction Compound BL2 will be located at Junction 6, Castleknock, west of the M50, as shown in **Image 7.2**.

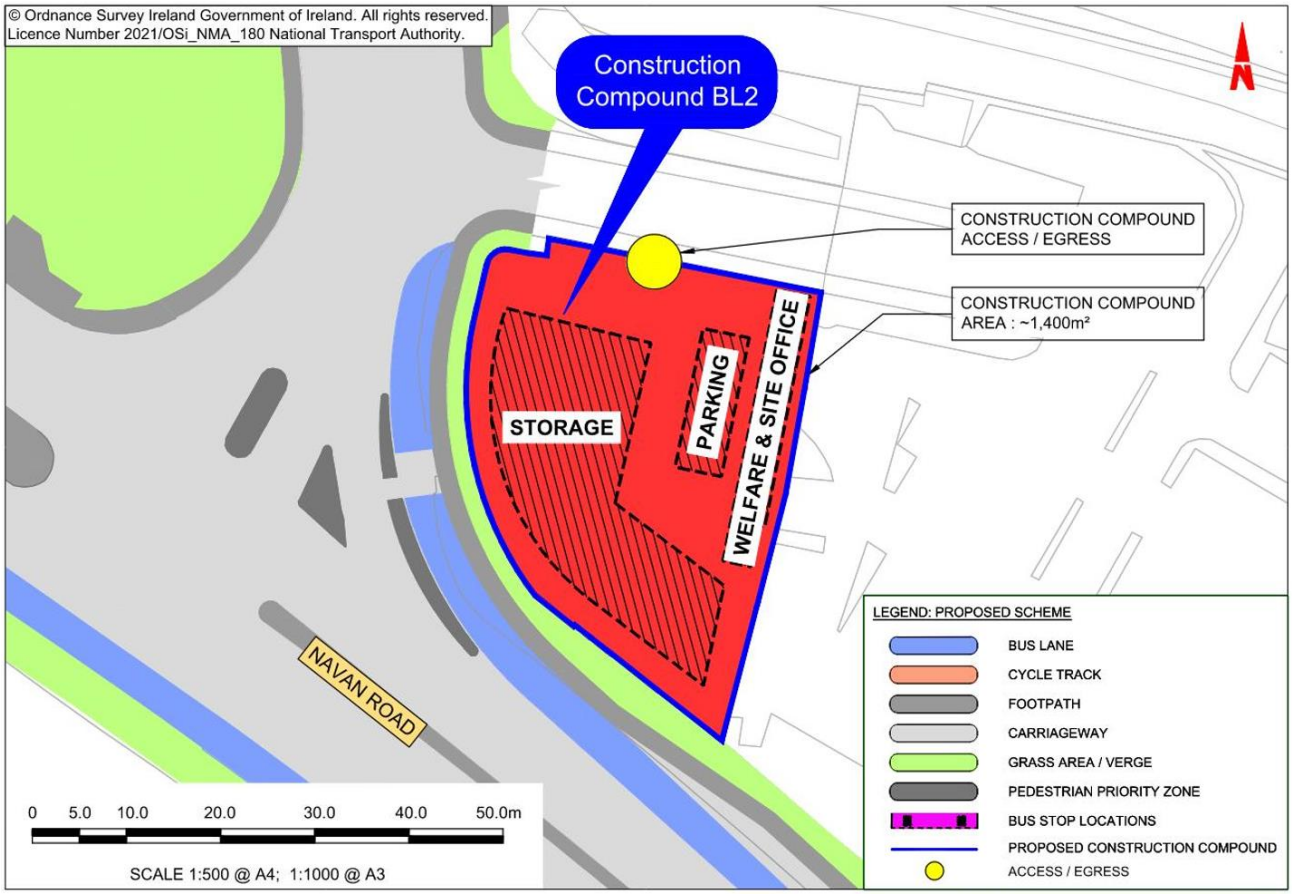

Image 7.2: Layout of Construction Compound BL2

Construction Compound BL3 will be located along the R147, east of the M50, as shown in **Image 7.3**. The Construction Compound will be divided by the Navan Road slip road, and a proposed road as part of the Proposed Scheme.

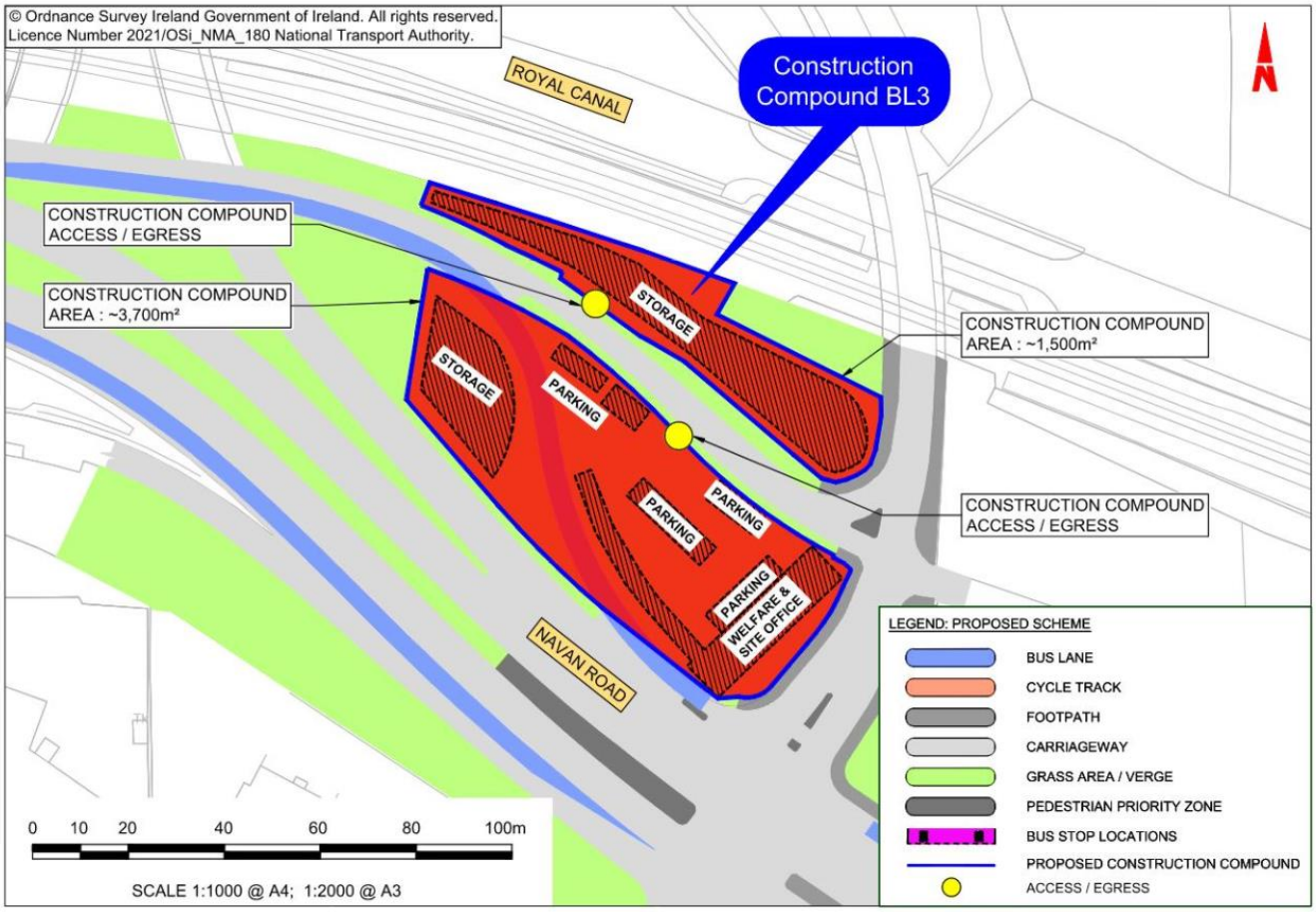

Image 7.3: Layout of Construction Compound BL3

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. The Construction Compounds will be secured, to ensure the safe storage of all on-site material and machinery.

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

Construction traffic management 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 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 24-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 maintained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development programme have been incorporated where appropriate.

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

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

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

- Traffic 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 and Resources;
- Material Assets; and
- 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 transportation impacts have been broken down under the following assessment topics for both the Construction and Operational Phases:

- The qualitative assessments are as follows:
    - **Pedestrian Infrastructure:** The changes to the quality of the pedestrian infrastructure as a result of the Proposed Scheme;
    - **Cycling Infrastructure:** The changes to the quality of the cycling infrastructure as a result of the Proposed Scheme;
    - **Bus Infrastructure:** The changes to the quality of the bus infrastructure as a result of the Proposed Scheme; and
    - **Parking / Loading:** The changes to the availability of parking and loading spaces as a result of the Proposed Scheme.
- The quantitative assessments are as follows:
    - **People Movements:** An assessment has been carried out to determine the potential impact that the Proposed Scheme will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the Proposed Scheme during the Operational Phase only;
    - **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.

A detailed Construction Traffic Management Plan (CTMP) will be prepared by the appointed contractor prior to construction, including Temporary Traffic Management arrangements prepared in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks'. The CTMP will be consulted upon with the road authority and will include measures to minimise the impacts associated with the Construction Phase upon the peak periods of the day. It will include embedded mitigation measures which will assist to alleviate any negative impact as a result of the Construction Phase of the Proposed Scheme. The appointed contractor will also prepare a Construction Stage Mobility Management Plan which will be developed prior to construction to actively encourage personnel to travel to site by sustainable means. The assessment concluded that the impact during the Construction Phase will be negative, slight to moderate, and temporary in nature.

The assessment of impacts assessed for the Operational Phase determines how the Proposed Scheme integrates within the existing transport network as well as assessing the potential impact of any changes to traffic flows in the direct and indirect study area. The assessment demonstrates the following:

- **Pedestrian Infrastructure:** Overall, the improvements to the quality of the pedestrian infrastructure will be positive, moderate and long-term in Section 2, positive, very significant and long-term in Sections 1, 3 and 4 and positive, significant and long-term in Sections 5 the Proposed Scheme.

- **Cycling Infrastructure:** The potential improvements to the quality of the cycling infrastructure will be positive, significant and long-term in Section 1, negligible in Section 2, positive, moderate and long-term in Sections 3 and 5 and positive, very significant and long-term in Section 4.
- **Bus Infrastructure:** The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will potentially be positive, profound and long-term in Section 1, positive, moderate and long-term in Section 2, positive, very significant and long-term in Sections 3, 4 and 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 94 spaces (-20 spaces in Section 4, and -74 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 Slight in Section 4 and Negative, Moderate and Long-term in Section 5.
- **People Movements:** Overall, it is anticipated that the increases to the total number of people travelling along the Proposed Scheme by sustainable modes will have a positive, very significant and long-term effect.
- **Bus Network Performance Indicators:** Overall it is anticipated that the improvements to the network performance indicators for bus users along the Proposed Scheme will have a positive, very significant and long-term effect.
- **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 a positive, significant and long-term effect whilst the impact of the redistributed general traffic along the surrounding road network will have a negative, slight and long-term effect.

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

Although it is recognised that there will be some negative impacts for general traffic and parking / loading availability, the Proposed Scheme has been designed and outlined within this assessment to take cognisance of the relevant traffic and transport guidelines. The assessment demonstrates that there will be no significant deterioration in the general traffic environment in the study area as a consequence of meeting the scheme objectives of providing enhanced sustainable mode priority along the direct study area. Given that the Proposed Scheme results in a positive impact for walking, cycling, bus and people movements, mitigation and monitoring measures are not required beyond those which have already been included in the design.

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.

Additionally, 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 may occur as a result of the Proposed Scheme.

The existing air quality in proximity to the Proposed Scheme meets National and European Union air quality standards, except at locations around Heuston Station and on Blackhall Place.

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, and landscaping. Appropriate mitigation measures to ensure that construction dust nuisance is minimised will be implemented for the duration of the Construction Phase.

Air quality impacts associated with Construction Phase traffic and changes in traffic flows have also been assessed. The impacts associated with the Construction Phase traffic emissions are predicted to be overall neutral and short-term on human receptors. The assessment identified a negative, slight and short-term impact on local ecological receptors due to construction traffic.

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. A moderate adverse impact is predicted on N1 Church Street, close to Arran Quay. 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. Climate change is a significant change to the average weather, and while climate change is a natural phenomenon, human activities are negatively impacting on the climate, through the release of greenhouse gases.

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

The impacts assessed during the Construction Phase included emissions from activities such as site clearance, utility diversions, road widening and excavation works (where required), works at junctions and landscaping. Construction traffic routes are also assessed as part of the assessment. 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 mitigations measures include the replacement, where practicable, of concrete containing Portland cement with concrete containing ground granulated blast furnace slag (GGBFS).

The Proposed Scheme is estimated to result in total Construction Phase greenhouse gas emissions of approximately 7,699 tonnes embedded CO_2eq for materials over the approximate 24-month construction period, equivalent to an annualised total of 0.006% of Ireland's national emissions in 2019 or 0.01% of Ireland's non-Emissions Trading Scheme 2020 target. Following the application of the mitigation measures, it is expected that there will be a negative, significant and short-term residual impact on climate as a result of the Construction Phase of the Proposed Scheme.

The maintenance greenhouse gas emissions associated with the Operational Phase of the scheme is predicted to generate 782 tonnes CO_{2eq} over the predicted 60-year lifespan. Following the implementation of mitigation, this impact is predicted to be negative, significant and permanent.

The operational traffic greenhouse gas emissions associated with the Operational Phase of the Proposed Scheme is predicted to be neutral and permanent.

Overall, when the carbon emissions associated with the maintenance and the Operational Phase are combined, the net greenhouse gas emissions will be neutral 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 greenhouse gas emissions, beyond those reported in the assessment. The Proposed Scheme has the potential to reduce greenhouse gas emissions equivalent to the removal of approximately 14,700 car trips per weekday from the road network in 2028 and 2043 respectively. This represents a significant contribution towards the national target of 500,000 additional trips by walking, cycling and public transport per day by 2030 as outlined as a target in the Government's 2021 Climate Action Plan.

The CBC Infrastructure Works (including the Proposed Scheme), 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 be perceptible to building occupants.

The potential impacts assessed for the Construction Phase included the generation of noise and vibration from utility diversions, road resurfacing and road widening works. Construction traffic routes were also assessed as part of the assessment.

For the duration of the Construction Phase, appropriate mitigation measures will be implemented, including the appropriate use of acoustic enclosures or screens where required to reduce noise. In addition, noise monitoring will be undertaken at sensitive receptors close to the working areas. The monitoring of vibration at identified sensitive buildings will be undertaken, where proposed works have the potential to be at or exceed the vibration limit values.

Following the application of these mitigation measures, noise impacts associated with the Construction Phase are predicted to be of negative, not significant to slight and temporary, with the exception of road widening and utility works. During the daytime, these works are predicted to have a negative, slight to moderate and temporary impact within 15m of the works. During the evening, impacts will be of negative, moderate to significant, temporary impact at distances between 15m to 20m from the works, and negative, significant to very significant and temporary at distances of up to 10m from the works.

Once operational, there will be a direct, moderate positive to slight negative impact along the Proposed Scheme due to a reduction or neutral change in traffic volumes during both the year of opening and the design year.

During the year of opening, 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, residual indirect impacts are calculated as negative, moderate, short to medium term along Georges Lane, Nephin Road and Old Navan Road. Along the remaining road network within the 1km study area, an indirect, positive, imperceptible to minor, short to medium term impact to indirect, negative, slight to moderate, 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, indirect impacts are calculated as positive, imperceptible to minor and long-term, to negative, slight and long-term. The overall prevailing long-term impact associated with the Proposed Scheme is positive to negative and slight.

8.5 Population

The population assessment considered the potential impacts of the Proposed Scheme on population. The assessment more specifically considered impacts on residential properties, community facilities and commercial businesses within the study area. The Population study area comprised 12 community areas: Mulhuddart, Corduff, Blakestown, Mount View, Blanchardstown, Laurel Lodge - Carpenterstown, Castleknock, Navan Road, Cabra West, Aughrim Street, Cabra and Halston Street.

The Proposed Scheme will commence in Blanchardstown on the outskirts of Blanchardstown Shopping Centre. The Proposed Scheme will join Junction 3 of the Navan Road and will continue along the M50 passing north of the community area of Castleknock and through Ashtown. The Proposed Scheme will continue to the community area of Navan Road, where the character of the area becomes more residential. The Proposed Scheme will continue past the community area of Cabra West, maintaining a largely residential character, occasionally passing commercial properties. The Proposed Scheme will continue on Prussia Street, through the community area of Aughrim Street where it becomes increasingly urban in character as the Proposed Scheme approaches the City Centre.

The impacts on population assessed for the Construction and Operational Phase 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 take from residential properties, community facilities and commercial businesses including removal of front gardens, driveways, private landings and private parking spaces.
- 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 Population assessment does not require specific mitigation measures as it is assumed that the residual impacts from the other environmental topic disciplines (air quality, noise, traffic and visual) are already mitigated as far as possible. As a result, residual impacts are the same as predicted impacts for the Population assessment.

During the Construction Phase, localised negative, short-term impacts are expected at 83 residential properties and one community facility (Little Stars Creche & Montessori) due to temporary land take. In addition, negative, slight and short-term impacts are expected on pedestrians and bus-users, and negative, moderate and short-term impacts on cyclists and private vehicles in the community areas of Blakestown, Blanchardstown, Castleknock, Navan Road, Cabra West, Aughrim Street and Halston Street.

During the Operational Phase, the community areas of Blakestown, Blanchardstown, Castleknock, Navan Road, Cabra West, Aughrim and Halston Street are expected to have the following long-term and positive impacts: moderate to very significant impacts on pedestrians; slight to very significant on cyclists; moderate to profound on bus users; and significant on private vehicles. In achieving the aims and objectives of the Proposed Scheme, it will provide 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.

The bus gate on part of Old Cabra Road is located in the community area of Aughrim Street. There is one business located along the bus gate, Go Station (filling station). Go Station is expected to be affected as a result of the proposed bus gate. Although this business can still be accessed by private vehicles, these will primarily be local residents in the surrounding community area and customers with existing knowledge of the location of the business. The primary source of income for the business is expected to be from passing trade, which is expected to be significantly reduced along Old Cabra Road due to the bus gates. During construction and operation of the Proposed Scheme it is expected that this business would no longer be able to operate successfully. The impact on this business is assessed as Negative, Very Significant and Long-Term during construction and operation of the Proposed Scheme.

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**: Wider Determinants of Health.

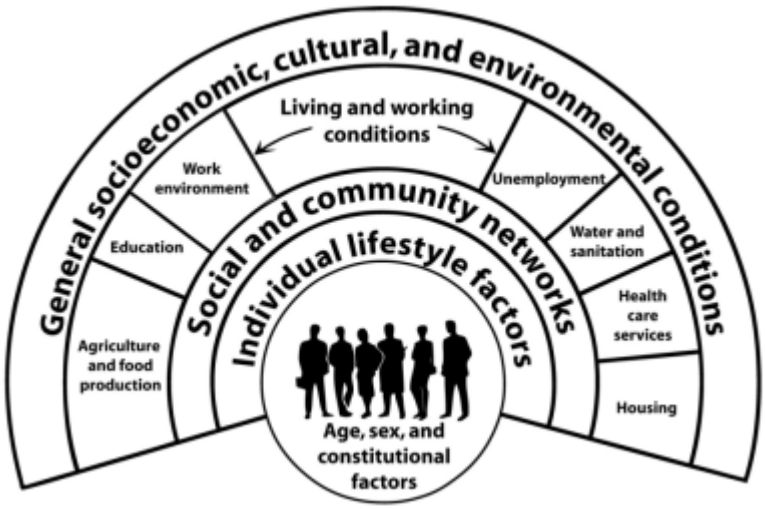

Image 8.1: Wider Determinants of Health (Source: Dahlgren and Whitehead 1991)

A related issue, is that of the 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 construction would likely cause frustration and annoyance particularly for commuters and people travelling to appointments. Construction noise and vibration, as well as dust may cause annoyance for some nearby residents and workers. The temporary 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 due to construction noise for shift workers. Mitigation measures to control and limit noise associated with the construction works are included in the EIAR.

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

8.7 Biodiversity

The biodiversity (ecology) assessment involved 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 sites. The nearest European site is South Dublin Bay and River Tolka Estuary SPA followed by South Dublin Bay SAC, which are both located approximately 2.89km and 4.6km east of the Proposed Scheme, respectively as the crow flies. The nearest European sites with a hydrological connection to the Proposed Scheme are North Bull Island SPA is also located in Dublin Bay, approximately 5.8km from the Proposed Scheme and South Dublin Bay and River Tolka Estuary SPA which is located approximately 6km downstream of the terminus at Ellis Quay, via the Liffey Estuary Upper. South Dublin Bay SAC is located approximately 6.8km downstream of the terminus at Ellis Quay, via the Liffey Estuary Upper. The Rye Water Valley / Carton SAC is located approximately 6.7km east (upstream) of the Proposed Scheme.

The main habitats within the Proposed Scheme include: mixed broadleaf woodland, hedgerows, treelines, scrub, dry meadows and grassy verges, grassland and buildings and artificial surfaces and water features, in particular the River Tolka. Fragmentary sections of priority Annex I Alluvial woodland vegetation was recorded along the

River Tolka valley and tidal rivers corresponding to Annex I Estuaries was also noted proximal to the Proposed Scheme.

The assessment identified:

- No protected plant species were recorded along the Proposed Scheme, although the Flora Protection Order 2015 species Opposite Leaved Pondweed is known to occur downstream along the Royal Canal pNHA;
- Five areas of third schedule, non-native invasive species outside of but adjacent to the Proposed Scheme (along the River Tolka);
- Five bat species (Leisler's bat, Common pipistrelle bat, Soprano pipistrelle bat, an unidentified pipistrelle species, and an unidentified *Myotis* species were recorded from across five transects;
- Four Potential Roost Features (locations where bats rest) located within the footprint of the Proposed Scheme;
- No evidence of badger;
- Other than prints and spraints at certain locations along the River Tolka, no otter habitation features were found during multidisciplinary surveys, although otter are present along the River Tolka and included documented habitation features downstream of the Proposed Scheme, as well as evidence of activity along the Royal Canal;
- No evidence of amphibians or reptiles;
- A total of 48 breeding bird species including the Annex I bird species Kingfisher and 1 wintering Bird, with 5 species in total listed as Annex I birds, 54 SCI species and an additional 13 red listed and 16 amber listed bird species; and
- Aquatic surveys identified good quality habitat for fisheries – and desk studies and consultation confirmed Atlantic salmon, Brown trout populations along the River Tolka which provides an important nursery for salmonids.

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

- Site preparation and clearance;
- Removal of existing boundaries, pavements, lighting columns, bus stops, and signage;
- Protection and / or diversion of buried services;
- Reconnection of existing and new drainage infrastructure into the existing surface water drainage infrastructure;
- Road widening, pavement reconstruction, and kerb improvements;
- Temporary and permanent land take;
- Installation of new bus stops and junction modifications;
- 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 undertaking pre-construction surveys for badger, otter, amphibians and bats prior to any works commencing and implementing a Surface Water Management Plan to ensure that measures are taken to protect surface waters and biodiversity associated with surface water. 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 construction will be not significant above the local level.

The impacts on biodiversity assessed for the Operational Phase include the presence and operation of traffic on roads within the Proposed Scheme, the introduction of new lighting (albeit typically low-level LED lighting) and under 3 lux) in previously unlit areas or where vegetation has been removed (until such time that replanting where undertaken matures), routine maintenance works and an overall increase in impermeable area.

The assessment concludes that there will be no significant impacts above the local level on 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 adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

8.8 Water

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

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

- Tolka_030, which comprises a number of separate tributaries which flow in a south east direction, coming together in full at Mullhuddart, a short distance upstream of the waterbody becoming the Tolk_040 segment;
- Tolka_040, which is 9.23km and consists of the main channel through Blanchardstown, as well as an unnamed minor tributary that joins the main channel at Connolly Hospital;
- Tolka_050, is 9.25km and consists of the main channel from Blanchardstown to Glasnevin, as well as three minor unnamed tributaries in Finglas;
  Liffey Estuary Upper, which is a transitional waterbody and is within the Liffey Nutrient Sensitive Area. It flows into Liffey Estuary Lower before reaching Dublin Bay. The waterbody covers an area of 0.2km2 from the National War Memorial Garden to approximately 40m upstream of the Talbot Memorial Bridge, which marks the upstream limit of the Liffey Estuary Lower; and
- Royal Canal Main Line (Liffey and Dublin Bay), which is an artificial waterbody (AWB), primarily used for recreation and was constructed in the 18th century, shortly after the Grand Canal. The Royal Canal is 146km long and runs from the River Liffey in Dublin to Cloondara on the River Shannon, with an 8km branch line into the town of Longford.

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

- Tolka_030: Poor status, At risk of Not Achieving Good status;
- Tolka_040: Poor status, At risk of Not Achieving Good status;
- Tolka_050: Poor status, At risk of Not Achieving Good status;
- Liffey Estuary Upper: Good Status, At Risk of not maintaining Good Status; and
- Royal Canal: Good Status, At risk status is Under Review.

The surface water along the Proposed Scheme corridor currently drains into a surface water system which directly discharges into the Tolka_040, the Tolka_050, the Royal Canal and combined sewer and on to Ringsend WwTP. The main existing pressure on water quality relates to urban runoff and overflows from combined sewer network (emergency only), other unknown anthropogenic pressures and culverting.

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

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

In addition to the implementation of the Surface Water Management Plan, site specific measures are proposed to avoid or reduce negative impacts related to such activities as the construction compounds, the widening of the Tolka River Bridge and Mill Road Bridge.

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 system in the form of filter drains and bioretention systems, 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 impacts are anticipated on any water body as result of the Operational Phase of the Proposed Scheme.

8.9 Land Soils Geology & Hydrogeology

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

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

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

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

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

- Loss or damage of topsoil;
- Excavation of potentially contaminated ground;
- Loss of future quarry or pit reserves;
- Loss or damage of a proportion of Geological Heritage Area;
- Loss or damage of proportion of aquifer; and
- Change to groundwater regime; and
- Loss or damage of a groundwater dependent 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 Authorities, and will be subject to their management procedures to ensure that the correct measures to be 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.

Prior to the 20th century, the majority of the study area comprised agricultural land that extended all the way to Cabra and Grangegorman on the outskirts of the city. Settlement outside of the city consisted of small villages, such as Blanchardstown, and dispersed settlement of rural character including country villas and modest farmsteads. There was also industrial activity, attracted by proximity to the River Tolka, such as the mill at Blanchardstown. It is only in the vicinity of Grangegorman that settlement would have taken on a more urban character in the 19th century. The Proposed Scheme will also be located in the historic City Centre on the north side of the River Liffey, progressing through what was once the medieval Oxmantown Green and the site of the Viking suburban settlement of Oxmantown. Archaeological sites representing the later urban growth in this part of the city include the Law Society of Ireland building, which was built in 1775 as the Blue Coat School, St Paul's Church off Blackhall Place, and the sites of a bowling green and a 18th/19th century house.

There are eight archaeological heritage features on the Records of Monuments and Places / Sites and Monuments Record, one Zone of Archaeological Potential, and three 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.

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 during and prior to construction.

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

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

8.11 Architectural Heritage

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

The Proposed Scheme follows an historic route into the city, though its present character, northwest of the Ashtown Roundabout, is modern, with residential, retail and industrial parks and motorway and dual carriageway road corridors.

Prior to the twentieth century, the area outside of the Royal Canal was open agricultural land. Blanchardstown was the only significant village, with country houses and their demesnes providing a secondary focal point for settlement clusters. There were also dispersed and modest farmsteads and mills. Two significant designed landscapes border the Proposed scheme. These are Phoenix Park and Abbotstown Demesne the legacy of which

is large areas of open space with mature planting providing recreational amenity, and historic character for the city. The historic boundary of the Abbotstown Demesne follows the Tolka Valley. There are areas of open space along the Royal Canal constructed in the middle of the nineteenth century, at the old Phoenix Park racecourse, at Kempton Avenue and The Paddocks, Belvedere sports grounds, St. Mary's Dominican Convent Cabra, and at St. Joseph's Cabra. Semi-mature tree lined streets are also notable along sections of the R147 Navan Road.

Southeast of the Ashtown Roundabout, along the R147 Navan Road and R147 Old Cabra Road, there are generally twentieth century sub-urban houses lining the route fronted by private gardens with some nineteenth and twentieth century institutional and religious buildings of note including St. Vincent's on the Navan Road which is a former workhouse now in use as a hospital (DCC RPS 5808). Other institutional buildings include Dominic's Secondary School, Navan Road (NIAH 50060134). In the 20th century, the area Cabra was developed as a Garden Suburb. Significant buildings which were constructed as part of this development include Our Lady Help of Christians, Navan Road (NIAH 50060137).

Inside the R101 North Circular Road there is an increasingly mixed-use urban and historic character, along Prussia Street, Manor Street and Blackhall Place, the curvature of the streets and the dense plot pattern attesting their origins in the Viking establishment centres on Oxmantown Green, which remained as an Hiberno-Norse settlement after the Anglo-Norman conquest in the twelfth century. Prussia Street and Manor Street saw continuous settlement and development through the eighteenth, nineteenth and twentieth centuries. They are characterized by eighteenth and nineteenth century terraced houses, public houses and small shops, with modern interventions slotting into the historic grain. The old market square at the junction of Aughrim Street, Prussia Street and Manor Street is an important and historic public space.

The Blue Coat School (DU018-020177) was a significant intervention onto another historic public space. It was built on Oxmantown Green c. 1775 to the design of Thomas Ivory and is now occupied by the Law Society of Ireland.

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 etc.) due to land acquisition, construction works to pavements, changes in the layout of footpaths and landscaping works;
- Indirect impacts as a result of the potential for damage to sensitive structures in areas where the construction works for the Proposed Scheme come into close contact with these structures;
- Indirect impacts as a result of the potential for damage to protected structures due to increased vibration from construction vehicles; and
- Visual impacts on the setting of protected structures or buildings or structures of architectural heritage interest, historic streetscapes and views which will temporarily impact on their setting during the Construction Phase.

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

- Appropriate recording, protection, removal, storage and reinstatement of boundaries and street furniture; and
- The retention or replacement of trees along the Proposed Scheme;

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

- Impacts associated with visual changes on architectural heritage resources (including from the proposed locations of bus shelters which have been carefully considered), as well as impacts on the setting of these resources due to traffic changes. New paving, new tree planting and landscaping will generally have a positive impact on the historic environment and character of streets along the Proposed Scheme; and
- Impacts where the Proposed Scheme requires physical changes to, or the repositioning of, heritage features.

Once the mitigation measures have been applied, there will be no significant residual impacts on the architectural heritage resource as a result of the Construction and Operational Phase of the Proposed Scheme.

8.12 Landscape (Townscape) & Visual

This assessment considered the potential landscape (townscape) and visual impacts of the Proposed Scheme. This assessment involved 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 of specific areas.

Along the section of the scheme from N3 Blanchardstown Junction to Ashtown Road Junction the townscape is centred around a significant multi-carriageway road corridor, with grade separated junctions, roadside planting and the wooded Tolka River Valley. At the western end of this section is the modern retail park / town centre of Blanchardstown with large areas of car parking and road infrastructure.

From Navan Road / Ashtown Road Junction to Navan Road / Old Cabra Road the townscape is centred around a long straight road corridor of mainly three lanes with some two-lane sections with roadside planting, and young street tree planting in adjoining often narrow footpaths or narrow verges. This is primarily an established residential area with traditional two-storey properties with gardens and driveways fronting either side of the road.

From Navan Road / Old Cabra Road Junction to Prussia Street the townscape is a primarily residential inner city suburb with mix of semi-detached and terrace properties, with some detached properties, and mature gardens with driveways fronting the road. Mature trees are a feature of some gardens and properties.

From Prussia Street to King Street North Junction the townscape is the characterful historic inner-city village of Stoneybatter. The road is of varying width and accommodates a range of commercial, residential, office and retail uses, of predominantly two and three-storey terraces, mainly within historic buildings with some infill redevelopment.

From King Street North Junction to Ellis Quay the townscape is made up of mixed urban streets of predominantly two-storey brick terraces in residential and office use, and occasional three-storey properties with higher modern infill redevelopments. The Law Society of Ireland building and grounds, with mature trees, is a prominent heritage feature at Blackhall Place.

Consideration of the potential landscape (townscape) and visual impacts have been important in defining the Proposed Scheme design. The scheme has undergone iterative design development with the aim of minimising potential negative impacts as far as practicable and this has also helped define suitable improvements to the urban realm. Examples of design changes that have been incorporated into the Proposed Scheme design, and which have led to a reduction in predicted landscape and visual impacts include:

- The previously proposed two-way cycle track westbound along the R147 Navan Road to Auburn Avenue Junction was modified with cyclists routed from the R147 to an on-street ‘Quiet Street’ cycle route along Castleknock Manor. This reduces the extent of land take required in this area which had potential to negatively impact on landscape amenity;
- Revised proposals along Manor Street resulted in a reduction from a maximum of four lanes (two bus lanes and two general traffic lanes) to two general traffic lanes. The modified design includes a northbound and southbound cycle track, wider footpaths and enhanced urban realm as a result of the reduction in carriageway width; and
- A northbound bus lane on Blackhall Place (at its junction with King Street North) was proposed and all northbound general traffic would be required to turn right into King Street North. The revised proposal for George’s Lane removes the southbound traffic lane and includes a two-way cycle track, resulting in wider footpaths which is potentially more beneficial to the amenity of the streetscape.

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

- Site mobilisation and establishment, fencing and hoarding of the Construction Compounds and works areas - including within private areas / gardens;

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

Construction of the Proposed Scheme will require property acquisition (temporary and / or permanent) from a number of residential properties, mainly along Navan Road. Temporary fencing / hoarding will be erected and access to property for the owners/ occupiers will be maintained for the landowner at all times where practicable. Works will require removal and reinstatement of existing roadside boundary walls, railings, entrances 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 of trees to be retained will follow a project specific arboricultural methodology for such works, which will be prepared / approved by a professional qualified arborist.

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, there will be moderate to very significant impacts on townscape which will be temporary and short term during Construction Phase of the Proposed Scheme. There will be very significant /profound, negative, temporary short-term impacts on residential properties with temporary land acquisition, and significant, negative, short-term impacts on properties adjacent to the scheme which are not included within temporary land acquisition. There will be moderate / significant, negative, temporary impacts on Conservation Areas, trees and vegetation, and amenity designations. There will be moderate, negative, short-term impacts on Protected Structures, Tree Protection Orders, Tree Protection Objectives, and non-residential properties with land acquisition.

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

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

Alterations in the road corridor and changes in traffic, pedestrian and cycle movements will be features of the Proposed Scheme. Changes in road corridors, including in traffic signalisation, signage, and in carriageway allocation and traffic movements are a common and regular aspect of active road and traffic management in urban roads and streets. Therefore, such aspects may be considered as a dynamic part of the receiving streetscape environment.

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, new planting and paving will be provided in replacement of those that are removed;
- 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;

- All impacted property boundaries will be reinstated; and
- Improved urban realm through introduction of areas of ornamental planting and high-quality paving.

The design process of the Proposed Scheme has included integrated landscape measures to avoid, reduce or mitigate impacts on landscape (townscape) and visual. The Proposed Scheme will become established and increasingly integrated within its landscape (townscape) setting and over time potential negative impacts will be reduced. To illustrate this change over time, the summary of potential Operational impacts are described as short-term and/or long-term:

- It is expected that there will be a moderate, negative, short-term impact on the Navan Road / Ashtown Road Junction to Old Cabra Road junction which will reduce to slight / moderate, negative in the long-term.
- There will be a moderate, positive impact during both the short-term and long-term between Old Cabra Road junction to Ellis Quay, due to improvements in the streetscape.
- There will be very significant, negative, short-term impacts on residential properties with permanent land acquisition which will reduce to significant negative in the long-term.
- It is expected that there will be moderate, negative, short-term impacts on Amenity Designations, Tree Preservation Orders / Tree Protection Objectives and non-residential properties with permanent land acquisition.
- Impacts on trees and vegetation will be moderate / significant, negative in the short term reducing to moderate, negative in the long-term.
- Impacts on Conservation Areas and Residential Conservation Areas are predicted to be slight / moderate, positive in the both the short-term and long-term.

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

In the Operational Phase, residual effects will remain for properties experiencing permanent land acquisition and in the loss of trees along the R147 Navan Road. However, the Proposed Scheme will also provide substantial levels of replanting of replacement trees, and a significantly enhanced level of service for public transport and for pedestrian / cycle connectivity. Likewise, the Proposed Scheme provides for improvements in the urban realm, which will provide positive long-term effects for the townscape and visual character in areas such as Stoneybatter and from the Navan Road / Old Cabra Road Junction to Ellis Quay generally.

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. This 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.

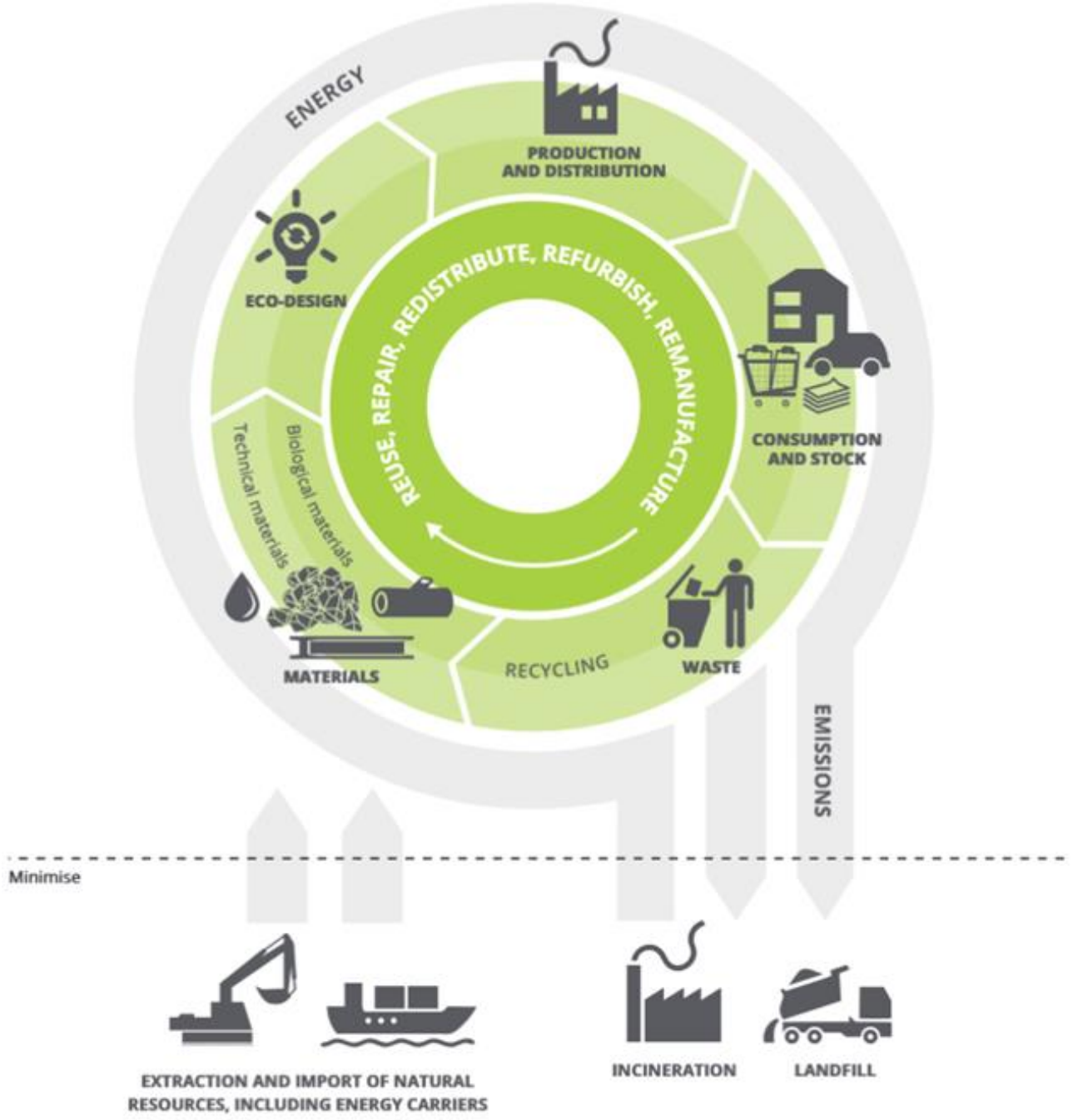

Image 8.2: A Simplified Model of the Circular Economy for Materials and Energy (Source: European Environment Agency (EEA) 2016)

In Ireland, the most recently available published data records that 8.8 million tonnes of construction and demolition waste was generated in 2019. This represented an increase of 2.6 million tonnes from 2018. Of this waste, 7.5 million tonnes was comprised of soil and stones and these make up 85% 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 3.1 million tonnes of municipal waste and recycled 37% of this waste in 2019.

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, overhead gantries, concrete kerbs, walls, fences and gates;
- Removal of small retaining walls;
- Removal of roundabouts and modification to signalised junctions;
- New street furniture, including traffic lights and bus stops and interchanges, and landscaping works;
- Removal of boundary walls, fences and gates;
- Minor utility diversions and / or protections will be required;
- Excavation of pavements and carriageways;
- Widening of bridges (River Tolka Bridge and Mill Road Bridge); and
- New pedestrian stair / ramp access at Mill Road Bridge.

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, in so far as is reasonably practicable. 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.

The approximately 2,600 tonnes of demolition waste that will be generated as a result of the Proposed Scheme is equivalent to 0.02% of the construction and demolition 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 165,000 tonnes. and is equivalent to 1.55% of the construction and demolition 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 decrease by approximately 4,550 tonnes. The predicted impact of operational construction and demolition waste will be positive, 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

This assessment considered the potential impacts of the Proposed Scheme on material assets. Material assets were 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 included a desk based review of these material assets. Utility information was requested from relevant organisations and service providers.

Existing material assets within the Proposed Scheme include:

- Electricity Supply Board electricity lines (high, medium and low voltage) and associated infrastructure;

- Gas Networks Ireland gas mains (high, medium and low pressure) and associated infrastructure;
- Irish Water drinking 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;
- M50 Motorway;
- Royal Canal;
- Railway lines (Western Commuter Line and South Western Commuter Line); and
- Luas Red Line.

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

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

- The Construction Compounds will require electricity to power temporary office and welfare facilities and for temporary lighting which will be required to be supplied via a connection to the grid network or a generator;
- The Construction Compounds will require a water supply for welfare facilities and spraying to prevent dust, wherever necessary;
- The 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;
- The diversion of an underground foul sewer where there will be an interface 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 mains where there will be interfaces with the Proposed Scheme works;
- The diversion of telecommunications infrastructure where there will be interfaces with the Proposed Scheme works; and
- Importation of construction materials including concrete, metals, cement, road surface materials and landscaping materials. The amount of materials required for the Proposed Scheme will represent less than one percent of the Irish quantities manufactured per year.

The Proposed Scheme has been designed to minimise the impact on utility infrastructure. This includes avoiding interactions with major utility infrastructure, wherever possible. Where there will be a clash with existing utility infrastructure, these will be protected in place or diverted as necessary to prevent long-term disruption to services. Diversions and changes to the location or layout of any utility infrastructure has been included in the overall design of the Proposed Scheme.

All possible precautions will be taken to avoid unplanned disruptions to any services during the Construction Phase. Proposed utility works are based on available records, and preliminary site investigations. Prior to excavation works being commenced, localised confirmatory surveys will be undertaken to verify the results the pre-construction assessments undertaken and reported in this EIAR.

Consultation has taken place with the major utility companies, and the appointed contractor will continue to consult 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 impacts on material assets as a result of the Proposed Scheme.

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

- The requirement for electricity connections for the proposed driver welfare facility, for new lighting, for bus stop information and for junction signalling;
- The requirement for a water and foul sewer connection for the proposed driver welfare facility; and
- The requirement for telecommunications connections at bus stops which contain real time passenger information, to allow the buses and the real time information to sync up with each other.

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

8.15 Risk of Major Accidents and / or Disasters

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

The risk assessment:

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

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

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

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

- Risk of pollution occurring to a watercourse or groundwater, most notably associated with the release of fine sediments during construction works;
- Risk of gas explosion due to striking an underground gas mains during excavation works;
- Risk of Major road traffic accidents resulting from Construction Phase traffic and works taking place adjacent to live traffic;
- Risk of spread of non-native invasive species during construction works, particularly during site clearance;
- Risk of structural damage or collapse of existing structures; and
- Risk of disruption to emergency response vehicles (fire, ambulance and Gardai).

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

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

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

No likely significant cumulative effects relating to traffic and transport are predicted, over and above the effects of the Proposed Scheme assessed in isolation.

With regard to air quality, as the cumulative traffic effects will be broadly in line with those of the Proposed Scheme in isolation, the associated cumulative air quality effects will not be significant. Dust mitigation at the Construction Phase for the Proposed Scheme, with similar measures in place for other projects, will mean that overall cumulative effects of construction dust will be neutral.

The construction of a wide range of projects in Ireland over the construction period of BusConnects Dublin - Core Bus Corridors Infrastructure Works will result in the generation of embodied carbon. These developments include

local planning applications, major projects, and strategic developments with a varying extent of embodied carbon generation. Any increase in carbon emissions is assessed as a significant negative impact. The climate impact assessment of road traffic emissions from the Construction Phase of the Proposed Scheme cumulatively with the 11 other Core Bus Corridor Schemes predicts a temporary overall increase of 2.6% of carbon dioxide-equivalent emissions compared to a scenario without the Core Bus Corridor Schemes. A series of embedded mitigation measures have been incorporated into the design of the Core Bus Corridor Schemes with the goal of reducing the embodied carbon and traffic emissions associated with the Construction Phase of all Core Bus Corridor Schemes. For example, concrete containing Portland cement will be replaced, where practicable with concrete containing ground granulated blast furnace slag which will save on embodied carbon across the 12 Core Bus Corridor Schemes.

With regards to construction traffic noise, and on the basis of the realistic worst-case scenario for construction traffic, a small number of roads will experience cumulative effects on noise and vibration over and above the effects of the Proposed Scheme in isolation. The roads experiencing cumulative effects from construction traffic noise are same roads experiencing construction traffic noise impacts when the Proposed Scheme is considered in isolation. All traffic noise impacts are considered temporary in nature.

With regard to Biodiversity, the construction of the Proposed Scheme in combination with other projects, will not give rise to cumulative impacts higher than the predicted residual impacts identified for the Proposed Scheme on its own (significant at a local scale).

In terms of Landscape (townscape) and Visual, where the Proposed Scheme construction will coincide and overlap with construction of other projects, a localised moderate, negative, temporary to short-term effect is predicted on townscape. The cumulative townscape effects during construction of the Proposed Scheme and Irish Water Blanchardstown project and the DART + Programme (West and South West) are predicted to be significant, negative, temporary to short-term. Effects on townscape, are most likely to occur at locations where concurrent construction of the Proposed Scheme and other projects have the potential to overlap, however, it is also likely that the extent of any such impacts will be localised and contained. These effects are predicted based on a worst case scenario where construction of the Proposed Scheme and other projects overlap.

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

For Operational Effects, the assessments assume all 12 proposed Bus Corridor Schemes would be operational, along with other identified projects and GDA 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.

No new additional significant adverse air quality impacts are identified in the cumulative operational scenario compared with the standalone scenario.

The climate impact assessment predicts a negative, significant and permanent cumulative impact on climate during the maintenance phase. A significant and positive impact is predicted on climate in 2028 with a neutral impact in 2043 due to the predicted cumulative change in operational traffic and the significant mode shift from car to more sustainable modes (walking, cycling and public transport). Fewer climate benefits are seen in 2043 relative to 2028 due to the further electrification of the wider fleet in both the Do Minimum and Do Something scenarios.

The Core Bus Corridor Infrastructure Works will also support the delivery of government strategies outlined in the CAP (DCCAE 2019) and the 2021 Climate Act by enabling sustainable mobility and delivering a sustainable transport system. The Core Bus Corridor Infrastructure Works will provide connectivity and integration with other

public transport services leading to more people availing of public transport, helping to further reduce GHG emissions.

Based on the analysis outlined above, it is concluded that the Core Bus Corridor Infrastructure Works achieves the project objectives in supporting the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets. The Core Bus Corridor Infrastructure Works has the potential to reduce GHG emissions equivalent to the removal of approximately 105,500 and 102,200 car trips per weekday from the road network in 2028 and 2043 respectively. This represents a very significant contribution towards the national target of 500,000 additional trips by walking, cycling and public transport per day by 2030 as outlined as a target in the 2021 Climate Action Plan (CAP) (DCCAE 2021). It is concluded that, cumulatively, the Core Bus Corridor Infrastructure Works will make a significant contribution to carbon reduction.

The potential changes in traffic noise due to the cumulative Operational Phase traffic impacts have been assessed and compared with those assessed for the standalone Proposed Scheme. The cumulative traffic noise assessment (with all 12 Core Bus Corridor Schemes operational), has concluded that during the opening year (2028) there will be more moderate impacts experienced during the short to medium term when the compared to the Proposed Scheme in isolation. During the future year (2043), traffic volumes predicted to be lower than the opening year (2028) along the surrounding road network which result in lower traffic noise impacts. Furthermore, the Noise and Vibration impact assessment (Chapter 9 in Volume 2 of the EIAR) notes that there will be an additional overall reduction in noise emissions due to a reduction in engine noise associated with the future fleet of electric vehicles.

The Human Health impact assessment has identified potentially beneficial cumulative effects on human health during the Operational Phase. Transport projects including DART+, MetroLink and Cycle Network, 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.

The Landscape (Townscape) and Visual assessment identified the potential for moderate or significant long term cumulative impacts on landscape (townscape) effects due to the overall increase in built form and loss of trees mainly in Tolka Valley when considering the operation of the Proposed Scheme in combination with Irish Water Blanchardstown project. However, the increase in built form and the loss of trees are largely attributed to the Irish Water Blanchardstown project. The cumulative effects will be reduced over time by the establishment of landscape planting as part of the Proposed Scheme. Overall, the landscape (townscape) effect is predicted to reduce (with the establishment of landscape planting) to slight / moderate, negative in the long term.

Significant impact 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 considered 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. These potential interactions have been incorporated into the relevant assessments.

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.blanchardstownscheme.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.blanchardstownscheme.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.