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1. Introduction

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the Templeogue/Rathfarnham 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 Scheme has an overall length of approximately 10km from end to end online with additional offline upgrades and quiet street treatment of approx. 2km and 1.5km respectively. The Proposed Scheme will be comprised of two main alignments, namely from Templeogue to Terenure (3.7km), and from Rathfarnham to the City Centre (6.3km).

The Templeogue to Terenure section, of the Proposed Scheme which measures approximately 3.7km, commences on the R137 Tallaght Road, east of the M50 junction 11 interchange. From here, the Proposed Scheme will be routed via the R137 along Tallaght Road and Templeogue Road, through Templeogue Village, to Terenure Cross, where it will join the Rathfarnham to City Centre Section of the Proposed Scheme.

The Rathfarnham to City Centre Section, which measures approximately 6.3km, of the Proposed Scheme will commence on the R821 Grange Road at the junction with Nutgrove Avenue and will be routed along the R821 Grange Road, the R115 Rathfarnham Road, the R114 Rathfarnham Road, Terenure Road East, Rathgar Road, Rathmines Road Lower, Richmond Street South, Camden Street Upper and Lower and Wexford Street as far as the junction with the R110 at Kevin Street Lower and Cuffe Street where priority bus lanes will end. From Cuffe Street to Dame Street along Redmond's Hill, Aungier Street, and South Great George's Street the Proposed Scheme will involve a traffic lane and a cycle track in both directions where it will join the prevailing traffic management regime in the City Centre. In addition to the above, an alternative cycle facility will be provided along Rathdown Park, Harold's Cross Road / Terenure Road North between Terenure Cross and Parkview Avenue, as well as along Bushy Park Road, Wasdale Park, Wasdale Grove, Zion Road and Orwell Road.

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 The 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 scheme design has been developed having regard to the relevant accessibility guidance and universal design principles so as to provide access for all users.

The provision of dedicated cycling infrastructure along the Proposed Scheme, will make cycling trips safer and more attractive. In this regard, the Proposed Scheme delivers substantial elements of the National Transport Authority (NTA) Greater Dublin Area Cycle Network, 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 will be provided in areas of high activity, which will contribute towards a safer, more attractive environment for pedestrians.

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 2022-2042 (referred to as the GDA Transport Strategy) (NTA 2022).

1.1. Aims and Objectives

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

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

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

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

The outcomes achieved from delivering the Proposed Scheme will be:

- An attractive, resilient, equitable public transport network better connecting communities and improving access to work, education and social activity;
- To facilitate a transport infrastructure network that prioritises walking and cycling and a mode shift to public transport; 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 Bord Pleanála, and constructing the Proposed Scheme (if approved).

2. Environmental Impacts Assessment Process

2.1 EIA Process

Environmental Impact Assessment (EIA) is the process by which an assessment of potential environmental impacts is carried out and if the predicted effects are unacceptable, design measures or appropriate mitigation measures can be taken to reduce or avoid those effects.

The EIAR reports the findings of the EIA carried out on the Proposed Scheme. The main objectives of the EIAR is to:

- Describe the baseline conditions before any work on the Proposed Scheme has commenced;
- Describe the Proposed Scheme;
- Describe the assessment methodologies used to assess the predicted environmental impacts of the Proposed Scheme;
- Describe environmental issues and any likely significant effects which may rise during the Construction and Operational Phases of the Proposed Scheme; and
- Propose mitigation measures to reduce or avoid these effects.
- 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 2023

Climate Action Plan 2023 is the second annual update to Ireland's Climate Action Plan 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve Ireland's emissions by 2030 and reach net zero no later than 2050.

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

One of the key actions to deliver abatement in transport identified in the Plan is the advancement of the BusConnects Programme in 5 cities (which includes Dublin).

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

3.4 Greater Dublin Area Transport Strategy

The Greater Dublin Area Transport Strategy 2022-2042 has replaced the previous transport strategy (for the period 2016 to 2035). The overall aim of the strategy is *'To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports the regional economy'*. A key focus of the strategy is to

enable increased use of other transport modes to meet environmental, economic and social objectives related to emissions, congestion and car dependency. It sets a clear direction towards a 50% reduction in CO₂ emissions within the Greater Dublin Area by 2030.

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

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

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

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

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

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

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

In the absence of the Proposed Scheme bus services will be operating in a more congested environment, leading to higher journey times for bus and lower reliability which will lead to reduced levels of public transport use, making the bus system far less attractive and less resilient to higher levels of growth. The absence of walking and cycling measures, provided in the Proposed Scheme, will significantly limit the potential to grow those modes into the future. Overall, the Proposed Scheme will make a significant contribution to the overall aims and objectives of BusConnects, the Greater Dublin Area Transport Strategy 2022 - 2042 and allow the city to grow sustainably into the future, which would not be possible in the absence of the Proposed Scheme.

4. Consultation

Public participation has been an integral part of the development of the Proposed Scheme from the outset. Non-statutory consultation was carried out, in three phases (one in relation to 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 EPR public consultation phase for the Proposed Scheme occurred from 23 January 2019 to the 30 April 2019..

The issues raised during the EPR 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 local 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 2020 were cancelled. In deference to the submissions which had already been received, the decision was made not to cancel the consultation.

The BusConnects Infrastructure team 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 PRO non-statutory public consultation..

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 NTA 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 the Environment, Climate and Communications, the Department of Transport, South Dublin County Council, Dublin City Council and the Heritage Council) and relevant non-statutory consultees were provided with a report outlining the proposed approach to the environmental assessment and were invited to comment. Feedback from this consultation was also used to inform the EIAR and the preliminary design proposals.

4.4 Consultation with Landowners

There has been ongoing engagement with landowners whose properties will be impacted, or potentially affected, as the design development for the Proposed Scheme has progressed, from the earliest stages of the project in 2018 through to February 2023. 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. Most recently during December 2022 and February 2023, letters have been issued to properties likely to be the subject of the Proposed Scheme Compulsory Purchase Order (CPO) process seeking to engage with them to ascertain ownership details. 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.

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 the NTA facilitated consultation on request with small local resident groups and with business interests on / adjacent to the route. Similar to the Community Forum meetings such events facilitated discussion on the design for the Proposed Scheme and attendees were given the opportunity to ask questions of the BusConnects Infrastructure team and provide feedback.

5. Alternatives Considered

5.1 Strategic Alternatives

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

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

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

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

Through the work undertaken in the preparation of the GDA Transport Strategy 2016 – 2035, 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 2016 – 2035 has concluded that new heavy rail and light rail/metro alternatives would not be justified by the predicted level of demand. The challenges outlined in the GDA Transport Strategy 2016 – 2035 and identified need for BusConnects Dublin as determined in the preparation of that prior strategy remain, and the evidence from the detailed corridor studies undertaken in the preparation of the prior strategy is still valid and robust.

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

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.

It should be noted that the initial route selection comprised of two separate sections (i) the Tallaght to Terenure and (ii) the Rathfarnham to City Centre section. However, as a result of careful consideration of the alternative route options, these two sections have now been combined in a single route as the Proposed Scheme. The principal reasons for combining the Tallaght to Terenure section and the Rathfarnham to City Centre section into the Proposed Scheme include: their geographical association, functional interdependence and the fact that the Tallaght to Terenure section joins the Rathfarnham to City Centre section at the junction of the R114 Rathfarnham Road and R137 Terenure Road and shares the remaining section of the route from that junction to the City Centre.

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

1. **Feasibility and Options Reports**, which were associated with the Proposed Scheme (Rathfarnham to City Centre Core Bus Corridor (CBC) Feasibility Study and Options Assessment Report and Terenure to Tallaght CBC Feasibility Study and Options Assessment Report), were prepared in 2017 and set out the initial route options and concluded with the identification of the Emerging Preferred Route;
2. A first round of non-statutory **Public Consultation** was undertaken on the Emerging Preferred Route from 23 January 2019 to 30 April 2019;
3. **Development of Draft Preferred Route Option** (April 2019 to March 2020). Informed by feedback from the first round of public consultation, stakeholder engagement and the availability of additional design information, the design of the Emerging Preferred Route evolved with further alternatives considered;
4. A second round of non-statutory **Public Consultation** was undertaken on the Draft Preferred Route Option from 4 March 2020 to 17 April 2020. Due to the introduction of COVID-19 restrictions, some planned in-person information events were cancelled, leading to a decision to hold a third consultation later in the year;
5. Further development of an updated **Draft Preferred Route Option** was undertaken subsequent to the second round of public consultation, which took account of submissions received, continuing stakeholder engagement and additional design information;
6. A third round of non-statutory **Public Consultation** was undertaken on the updated Draft Preferred Route Option from 4 November 2020 to 16 December 2020; and
7. Finalisation of the **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 wide network of roads between:

- Rathfarnham to City Centre Corridor; and
- Tallaght to Terenure Bus Corridor.

These were narrowed down using a high-level qualitative method based on professional judgement and a general appreciation for existing physical conditions / constraints, including environmental considerations, within the study area.

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

- Economy;
- Integration;
- Accessibility & Social Inclusion;
- Safety; 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 summarized as follows:

‘The Tallaght to Terenure Core Bus Corridor commences on the R137 Tallaght Road, east of the M50 interchange. From here, the CBC is routed via the R137 along Tallaght Road and Templeogue Road, through Templeogue village, to Terenure Cross, where it joins the Rathfarnham Core Bus Corridor. 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.’ And

‘The Rathfarnham Core Bus Corridor commences on the R821 Grange Road at the junction with Nutgrove Avenue, and is routed along the R821 Grange Road, the R115 Rathfarnham Road, the R114 Rathfarnham Road, Terenure Road East, Rathgar Road, Rathmines Road Lower, Richmond Street South, Camden Street Upper and Lower and Wexford Street as far as the junction with the R110 at Kevin Street Lower and Cuffe Street where priority bus lanes end. From Cuffe Street to Dame Street along Redmonds Hill, Aungier Street, and South Great George’s Street the route will involve a traffic lane and a cycle track in both directions where it will join the prevailing traffic management regime in the city centre.

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 local residents, community groups and stakeholders, and / or arising from the availability of additional information. These amendments were incorporated into the designs and informed a draft PRO.

Alternatives considered during the development of the Draft PRO included the following:

- Providing signal controlled priority at either side of Templeogue Village to facilitate bus priority through the village which reduced the need for road widening along this section. The proposals are intended to tie into the SDCC Templeogue Village scheme; and
- Providing an alternative cycle route along the Owendoher River in Rathfarnham, creating a connection to the proposed Dodder Greenway and connecting back to Rathfarnham Road at Rathdown Park. This reduced the need for land-take on Rathfarnham Road and eliminated the need for alternative cycling facilities through Brookvale Downs.

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

6. Description of the Proposed Scheme

The Proposed Scheme has an overall length of approximately 10km from end to end online with additional offline upgrades and quiet street treatment of 2km and 1.5km respectively. The Proposed Scheme will be comprised of two main alignments, namely from Templeogue to Terenure (3.7km), and from Rathfarnham to the City Centre (6.3km)

The Templeogue to Terenure section will commence on the R137 Tallaght Road, east of the M50 junction 11 interchange. From here, the Proposed Scheme is routed via the R137 along Tallaght Road and Templeogue Road, through Templeogue Village, to Terenure Cross, where it joins the Rathfarnham to City Centre section.

The Rathfarnham to City Centre section will commence on the R821 Grange Road at the junction with Nutgrove Avenue, and will be routed along the R821 Grange Road, the R115 Rathfarnham Road, the R114 Rathfarnham Road, Terenure Road East, Rathgar Road, Rathmines Road Lower, Richmond Street South, Camden Street Upper and Lower and Wexford Street as far as the junction with the R110 at Kevin Street Lower and Cuffe Street where priority bus lanes will end. From Cuffe Street to Dame Street along Redmond's Hill, Aungier Street, and South Great George's Street the route will involve a traffic lane and a cycle track in both directions where it will join the prevailing traffic management regime in the City Centre. In addition to the above, an alternative cycle facility will be provided along Harold's Cross Road / Terenure Road North between Terenure Cross and Parkview Avenue, as well as along Bushy Park Road, Wasdale Park, Wasdale Grove, Zion Road and Orwell Road.

The design of the Proposed Scheme has evolved through comprehensive design iteration with particular emphasis on minimizing 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**.

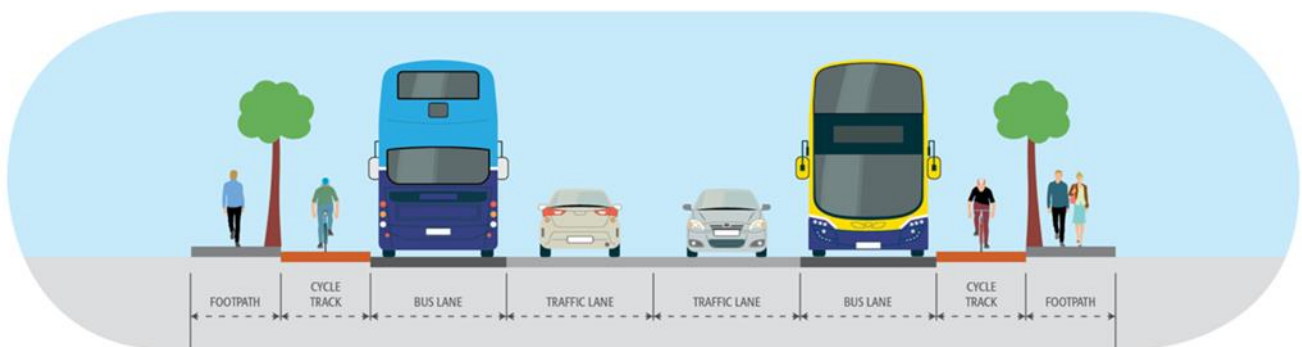


Image 6.1 Typical bus road layout

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 39% from 76 to 106 as a result of the Proposed Scheme;
- The proportion of segregated cycle facilities will increase from 28% on the existing corridor to 85% on the Proposed Scheme; and
- The proportion of the route having bus priority measures will increase from 32% on the existing corridor to 87% on the Proposed Scheme.

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

- Section 1: Tallaght Road to Rathfarnham Road;
- Section 2: Nutgrove Avenue to Terenure Road North -Grange Road, Rathfarnham Road;
- Section 3: Terenure Road North to Charleville Road – Terenure Road East, Rathgar Road; and
- Section 4: Charleville Road to Dame Street.

6.1 Section 1: Tallaght Road to Rathfarnham Road

The Proposed Scheme will commence on the R137 Tallaght Road adjacent to D'Arcy McGee's, east of the M50 interchange. It is proposed to retain the existing bus and traffic lane configuration on the R137. Between the M50 interchange and the Spawell Roundabout junction it is proposed to relocate the existing two-way cycle track to the carriageway side of the footpath to better tie in with proposals at the Wellington Lane junction. It is proposed to convert the Spawell Roundabout to a signalised junction with kerb protection for cyclists. The design of this junction has been coordinated with design proposals under the Wellington Lane Walking and Cycling Scheme and the Dodder Greenway.

Between the Spawell Roundabout and Cypress Grove Road junction, it is proposed to retain the existing bus and traffic lane configuration on the R137. The existing cycle track on the northern side of the carriageway will be relocated to the carriageway side of the footpath, and a new cycle track provided on the southern side of the carriageway between Cheeverstown and the Wellington Lane junction. At the Cypress Grove Road junction, general through traffic may divert to Old Bridge Road for access to the City Centre via the R114. Significantly enhanced cycle facilities will also be provided at this junction with the introduction of kerb protection.

Within this section the existing free standing stone arch adjacent to the R137 Templeogue Road will be cleared of the overgrown vegetation which currently covers it and conserved in its existing location. The existing fencing around the arch will be removed and the arch opened up to the public realm. It is proposed to install high quality stone paving, decorative lighting and soft landscaping elements around the arch as well as to construct a new footpath running behind the arch.

The existing service/access road serving 252 to 258 Templeogue Road will be converted to provide a shared surface for vehicles and pedestrians. This will facilitate the provision of an outbound bus lane to the stop line at the Cypress Grove Road junction, while minimising land acquisition from properties to the north of Templeogue Road.

Between the Cypress Grove Road junction and the Ashfield Place development it is proposed to provide bus lanes and traffic lanes in each direction. A limited amount of land take will be required from a number of residential properties on the northern side of the carriageway to achieve this cross section. Dedicated cycle facilities are provided on the approach to the Cypress Grove Road junction, however these will terminate approximately 100m from the junction where cyclists will share the bus lane in an inbound direction and the general traffic lane in an outbound direction. To improve safety for cyclists, it is proposed to introduce a 30kph speed limit between Cypress Grove Road and Templeogue Village. Outside the Ashfield Place Development, there is insufficient space for a bus lane and a general traffic lane in each direction. Therefore, it is proposed to stop the outbound bus lane for a distance of approximately 170m and use Signal-controlled priority along this section.

Between Ashfield Place and the Templeogue Tennis Club, it is proposed to provide a bus lane and a general traffic lane in each direction. It is proposed to utilise a limited amount of land-take within this section to achieve the desired cross-section.

Within Templeogue Village, between Templeogue Tennis Club and the Templeville Road junction, it is proposed to manage bus priority through the use of Signal-controlled priority and tie into South Dublin County Council's Templeogue Village Initiative Scheme.

North of Templeogue Village, a cross section consisting of a general traffic lane, and bus lane and a cycle track in each direction is resumed. Between the village and the Springfield Avenue junction, the width of the proposed cycle tracks is reduced locally to minimise the impact on existing mature trees in this section.

At the junction with Templeville Road, general inbound through traffic may divert to the R112 and further to the R114 through the reintroduction of the right turn onto Springfield Avenue. It is proposed to introduce kerb protection at this junction which will improve cycle facilities and cyclist safety.

Between the Templeville Road junction and Fortfield Road it is proposed to provide one bus lane, one general traffic lane and cycle tracks in each direction. The proposed cycle tracks have been narrowed to 1.5m along this

section to minimise impacts on mature trees tree on the eastern side of the road. It is proposed to upgrade the Fortfield Road junction to provide a direct, protected cycle crossing for inbound cyclists to a proposed two-way cycle facility on the eastern side of Templeogue Road north of the junction.

Between Fortfield Road and Terenure Road West, the Templeogue Road width is heavily constrained. Within this section of the Proposed Scheme, it is proposed to maintain one outbound bus lane, one outbound general traffic lane and one inbound general traffic lane. A segregated two-way cycle track and footpath is proposed on the southern side of the carriageway within Bushy Park along the alignment of the existing shared path.

This cycle track will link to a quiet street treatment on Rathdown Drive. The existing dirt path through the green space adjacent to Rathdown Drive will be formalised as a footpath, through shallow dig construction methods to minimise impacts on the existing trees within this area.

It is proposed to provide an inbound a Bus Gate at the junction of Olney Grove, which will restrict northbound general traffic on Templeogue Road from accessing Terenure Road West or Terenure Place during the hours of operation of the Bus Gate (06:00 – 20:00 - 7 days a week). A right turn ban is proposed from Fergus Road to Templeogue Road, and a left turn ban from Olney Grove to Templeogue Road.

Right turn bans are also proposed from Templeogue Road to Rathdown Park and to Rathdown Avenue and from Fortfield Road to Greenlea Road and to Lavarna Grove in order to prevent through traffic diverting inappropriately. A quiet street treatment to Rathdown Crescent is intended to tie into the proposed quiet street treatment on Rathdown Park described in Section 2 of the Proposed Scheme section.

6.2 Section 2: Nutgrove Avenue to Terenure Road North – Grange Road, Rathfarnham Road

Section 2 of the Proposed Scheme will commence at the junction of Grange Road and Nutgrove Avenue, where it will tie into the Grange Road Cycle scheme. It is proposed to upgrade this junction through the provision of kerb protection for cyclists. This will require a limited amount of land take from the entrance to the Rathfarnham Wood development. It is also proposed to reconfigure the existing car park adjacent to this junction to facilitate the revised road arrangement and to install a new island bus stop layout in this location.

Between this junction and the Castleside Drive junction it is proposed to provide a single bus lane alongside general traffic lanes and cycle tracks in both directions. To accommodate the road layout, it is proposed to utilise limited land-take from adjacent properties, including setting back the existing boundary wall to Rathfarnham Castle Park. The existing boundary wall of Rathfarnham castle will be set back and reconstructed with a round capping roughcast render.

It is proposed to upgrade the junction of Rathfarnham Road and Willbrook Road through the provision of kerb protection for cyclists. It is also proposed to upgrade the junction of Rathfarnham Road and Butterfield Avenue through the provision of kerb protection for cyclists. This will require the removal of general traffic lanes on the Butterfield Avenue arm of this junction.

On the section of Rathfarnham Road between Castleside Drive and Dodder Park Road, it is proposed to provide an inbound bus lane, two general traffic lanes and a 1.5m wide outbound cycle track, with outbound bus priority provided through signal-controlled priority. Due to construction related constraints, the inbound cycle track will be curtailed over approximately 270m, with cyclists utilising the bus lane over this short section. A section of inbound cycle track will be provided at either end of this section, on approach to junctions. It is proposed to introduce a 30 kph speed limit on Rathfarnham Road at this point due to the fact that inbound cyclists will be sharing the bus lane through this section. This 30 kph speed limit will continue from here to the City Centre, due to the presence of multiple urban villages along the route, as well as other sections where cyclists share the bus lane. This consistent speed limit is proposed to ensure legibility for road users along the route and to avoid frequent increases and decreases in speed limits.

To accommodate the new configuration on Rathfarnham Road between Castleside Drive and Dodder Park Road, it is proposed to utilise land-take from adjacent properties on the western side of the road, south of Brookvale Road.

To maintain bus priority through the Dodder Park Road and Rathfarnham Road junction, it is intended to provide signal-controlled priority on the southern and northern approaches to the junction. It is proposed to upgrade this junction through the provision of kerb protection for cyclists, which will tie into the proposed Dodder Greenway on Dodder View Road and Dodder Road Lower.

Between Dodder Park Road and Rathdown Park, it is proposed to provide bus priority through a combination of signal-controlled priority and partial bus lanes, with 1.5m wide cycle tracks provided. To accommodate the new configuration within this section it is proposed to utilise land-take from adjacent properties on the western side of the road.

Between Rathdown Park and Bushy Park Road, no bus lanes are proposed. It is proposed to maintain bus priority by providing signal-controlled priority in both directions and managing traffic queues in this area.

From Bushy Park Road to Terenure Road North it is proposed to provide 1.5m wide cycle tracks, bus lanes and traffic lanes in both directions. To accommodate these new bus lanes on this section of Rathfarnham Road, it is proposed to acquire land from adjacent properties on the eastern side of Rathfarnham Road.

At the Terenure Road North junction it is intended to extend the existing bus lane and proposed cycle track as far as the junction stop line. Bus movements through this junction will be managed with signal-controlled priority. A number of existing parking spaces on the approach to Terenure Village will be removed to facilitate the proposed cross section.

6.3 Section 3: Terenure Road North to Charleville Road – Terenure Road East, Rathgar Road

On Terenure Road East, between the Terenure Road North junction and St. Joseph's Church, due to the proximity of existing built form to the carriageway, it is proposed to provide a single general traffic lane in each direction. Bus priority will be provided through this section by signal-controlled priority. It is also proposed to widen the footpaths within this section and to provide high-quality urban realm within Terenure Village.

Between St. Joseph's Church and the Rathgar Avenue junction it is intended to provide a bus lane and general traffic lane in both directions. To accommodate the proposed cross section, it is proposed to acquire land from adjacent properties on both sides of Terenure Road East.

It is also proposed to provide an alternative cycle facility consisting of cycle tracks in each direction along Terenure Road North and Harold's Cross Road, connecting to the Kimmage to City Centre Core Bus Corridor Scheme at Harold's Cross. An additional alternative cycle facility is proposed along Bushy Park Road, Wasdale Park, Wasdale Grove, Victoria Road, Zion Road and Orwell Road to provide a secondary east-west route for cyclists travelling between Rathfarnham Road and Rathgar Road.

At Rathgar Avenue, it is proposed to maintain bus priority through the junction with signal-controlled priority.

Along Rathgar Road it is proposed to provide bus lanes and 1.5m wide cycle tracks in each direction and a one-way inbound general traffic lane only. Local access for residents on Rathgar Road and adjoining streets will be maintained through the surrounding road network via Rathgar Avenue or Rathmines Road Upper including Frankfort Avenue, Leicester Avenue, Garville Avenue, Garville Road and Highfield Road.

It is proposed to upgrade the junction of Rathgar Road and Grosvenor Road through the provision of kerb protection for cyclists.

It is proposed to remove the current right turn ban from Rathmines Road Upper to Highfield Road as well as the right turn ban from Highfield Road onto Rathgar Road to facilitate outbound general traffic movements.

6.4 Section 4: Charleville Road to Dame Street

On Rathgar Road and Rathmines Road Lower between Charleville Road and Castlewood Avenue it is proposed to provide an inbound bus lane, an inbound and outbound traffic lane and cycle tracks in each direction. Outbound

bus priority will be provided through signal controlled priority. It is proposed to upgrade the junction of Rathmines Road Upper with Rathmines Road Lower/Rathgar Road through the provision of kerb protection for cyclists. An upgraded public realm will be provided at this junction through the reallocation of road space.

Between Castlewood Avenue and Grove Road, a general traffic lane and a cycle track in each direction are proposed, with the provision of a Bus Gate between Richmond Hill and Lissenfield which will restrict general traffic movements during the hours of operation of the Bus Gate (06:00 – 20:00 – 7 days a week). This proposal also allows for some increase to footpath widths through Rathmines and the provision of 2m wide cycle tracks in each direction through the village.

It is proposed to reverse the existing one-way traffic regime on Williams Park to facilitate traffic to turn off of the main CBC route at Military Road in advance of the Bus Gate and return via Williams Park. It is proposed to provide a mini-roundabout outside of St Mary's College to facilitate school drop off.

It is proposed to restrict movements on Mountpleasant Street Lower, north of the junction with Richmond Hill to pedestrians and cyclists only through the introduction of planted build-outs. It is also proposed to reintroduce the right turn from Richmond Hill to Mountpleasant Avenue Upper, to facilitate general traffic to turn off of the main CBC route at Richmond Hill in advance of the Bus Gate and return via Mountpleasant Avenue Upper. Due to the restricted road width at this location, a traffic light shuttle system is proposed to safely manage these traffic movements.

At La Touche bridge it is proposed to provide an inbound bus lane and an outbound general traffic lane along with a high quality segregated cycling facility, to facilitate connectivity with the Grand Canal cycleway. Inbound general traffic will be required to turn left onto Grove Road at this point. Outbound bus priority across the bridge will be provided through signal controlled priority from a proposed traffic signal on Richmond Street South approximately 70m north of the bridge.

On Richmond Street South, it is proposed to maintain the outbound traffic lane with a bus lane and cycle tracks in both directions. Immediately south of the junction of Harrington Street/Harcourt Road/Richmond Street South, the outbound bus lane will be curtailed due to space constraints.

It is proposed to restrict movements into and out of Lennox Street to pedestrians and cyclists only through the introduction of planted build-outs. It is also proposed to upgrade the junction of Richmond Street South and Harrington Street through the provision of kerb protection for cyclists.

On Camden Street Upper between Harcourt Road and Charlotte Way, one bus lane in each direction and one inbound general traffic lane is proposed, with a cycle track provided in each direction.

Between Charlotte Way and Cuffe Street it is proposed to provide bus lanes in each direction and a single outbound general traffic lane on Camden Street/Wexford Street. The outbound bus lane will not commence until just south of Montague Street due to the proximity of existing built form to the carriageway. Bus priority will be achieved by signal controlled priority over this section. Under this proposal, inbound traffic will reroute to Harcourt Street to access Cuffe Street and beyond. 1.5m wide cycle tracks are proposed in this section in order to provide sufficient footpath space in this area of significant pedestrian activity.

Between Cuffe Street and Dame Street it is proposed to provide one general traffic lane and one cycle track in each direction. No bus lanes will be provided on this section of the route. Where practicable, on-street parking bays and loading bays will be retained. The Proposed Scheme ties into the existing road network on Dame Street.

Turning restrictions are proposed at a number of locations off the immediate CBC route to prevent through traffic diverting inappropriately. These locations are summarised below:

- Proposed right turn ban from Grand Parade onto Dartmouth Place;
- Proposed right turn ban from Cullenswood Road onto Ranelagh Road;
- Proposed right turn ban from Ashfield Road onto Ranelagh Road;
- Proposed left turn bans from Chelmsford Lane and Sallymount Avenue onto Ranelagh Road; and
- Proposed right turn ban from Merton Drive onto Sandford Road.

7. Construction

The Construction Phase for the Proposed Scheme will take approximately 24 months to complete. However, individual activities will have shorter durations.

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

- Site preparation and clearance works, including:
 - Land acquisition where temporary or permanent land take is required;
 - Installation of fencing and signage;
 - Protection of trees and vegetation to be retained;
 - Vegetation clearance and treatment of non-native invasive plant species;
 - Archaeological investigations;
 - Ground investigations;
 - Set up of Construction Compounds;
 - Installation of temporary lighting; and
 - Demolition of items such as walls, gates, fencing, lighting poles and bus stops.
- Road and street upgrades, including:
 - Excavation of the road surface;
 - 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:
 - Templeogue Archway;
 - Rathfarnham Castle Boundary Walls;
 - Variable Message Signs; and
 - Retaining Wall.
 - 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 TR1: At the Tallaght Road / Spawell Link Road junction;
- Construction Compound TR2: Terenure Road North, between Eaton Road and Eagle Hill Avenue;
- Construction Compound TR3: Bushy Park, between Dodder View Road, Woodview Cottages and Church Lane;
- Construction Compound TR4: Military Road, perpendicular to Rathmines Road Lower, south of St Marys College;
- Construction Compound TR5: Richmond Street South, between Richmond Street South and Harcourt Road;
- Construction Compound TR6; Spawell Link Road, between Spawell Roundabout and Firhouse Road.

Construction Compounds will be used as the primary location for the storage of materials, plant and equipment, site offices, worker welfare facilities and limited car parking. They will be secured to ensure the safe storage of all on-site materials and machinery. The Construction Compounds are shown in **Image 7.1** to **Image 7.6**.

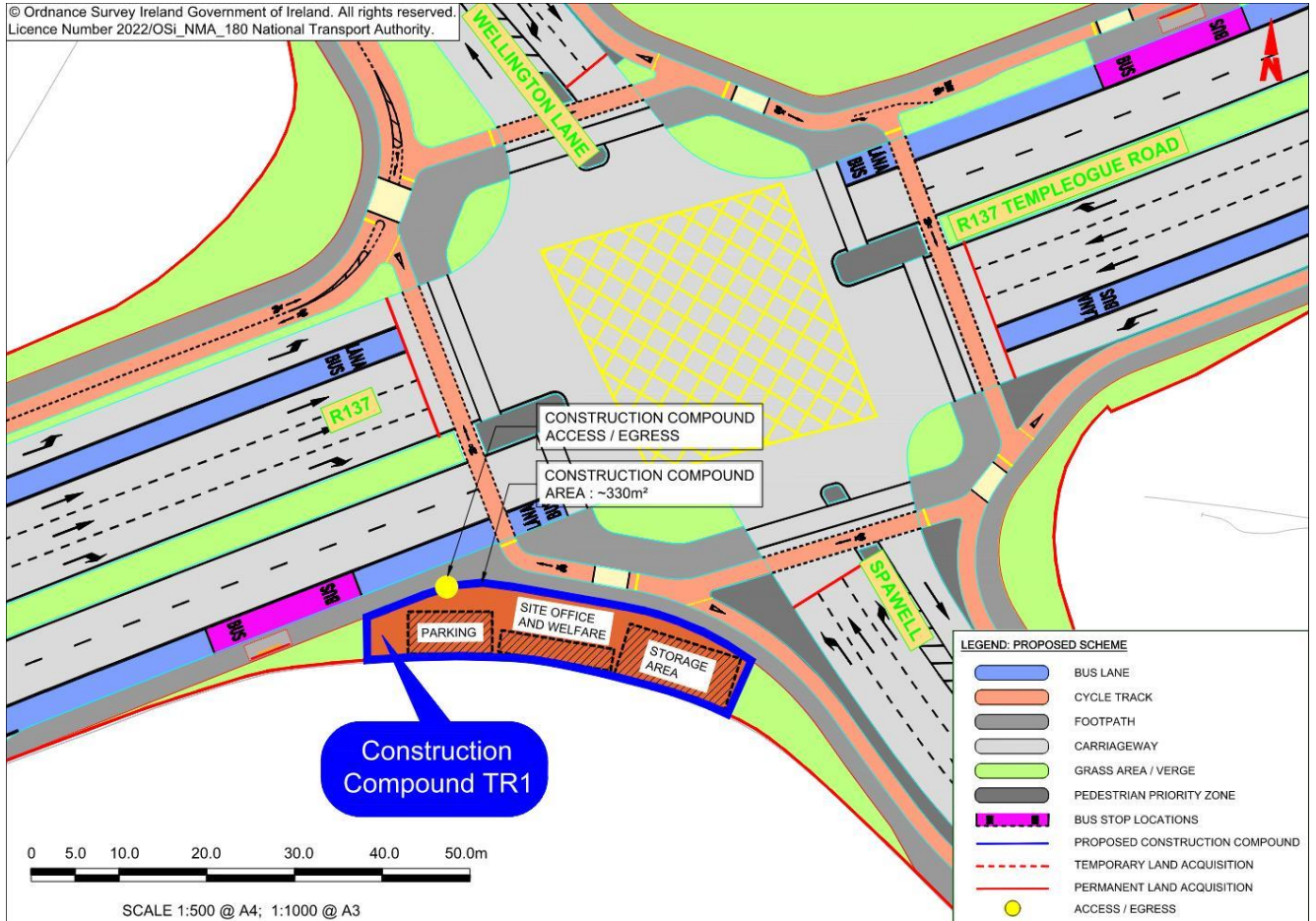


Image 7.1 Location and Extent of Construction Compound TR1

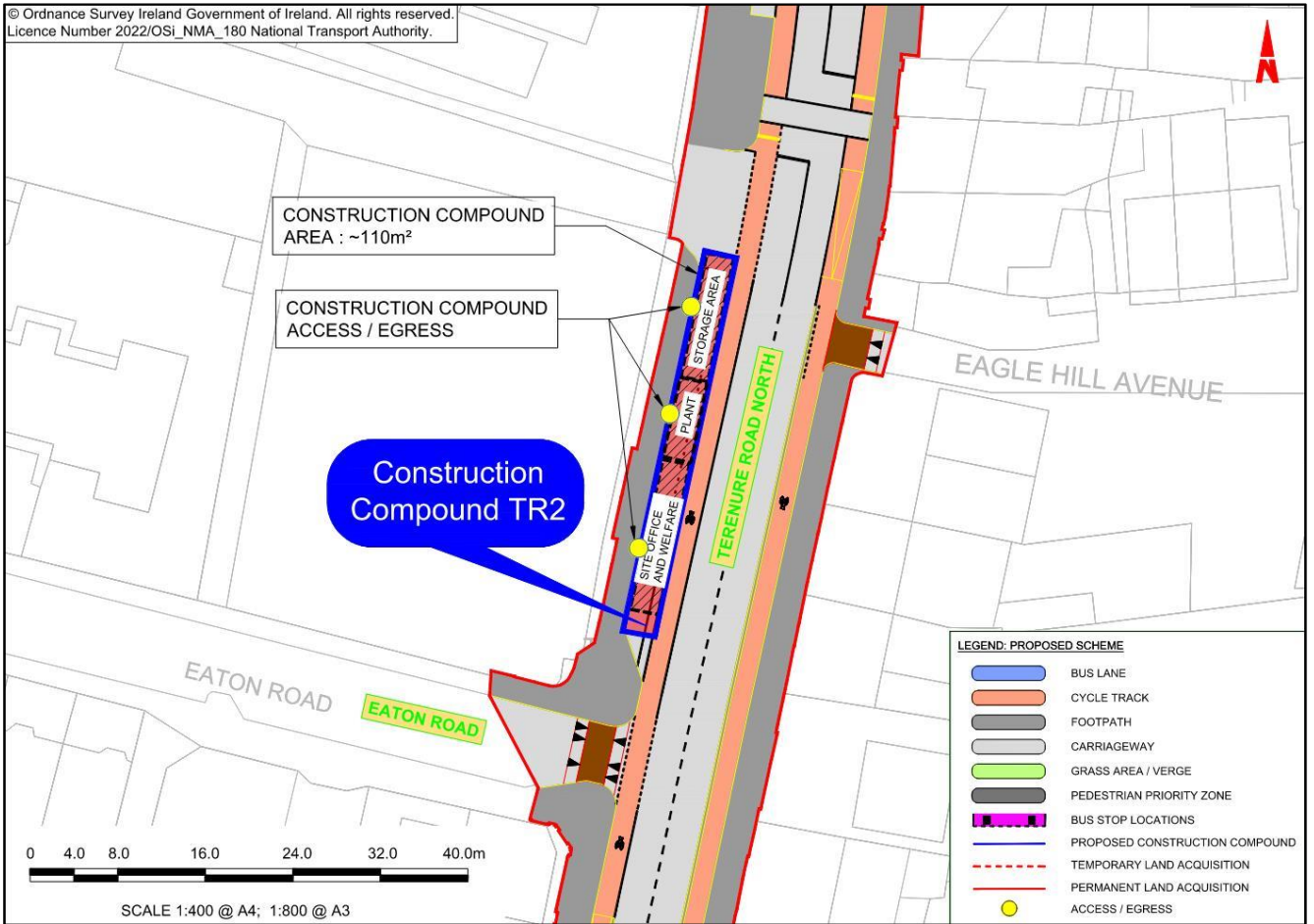


Image 7.2 Location and Extent of Construction Compound TR2

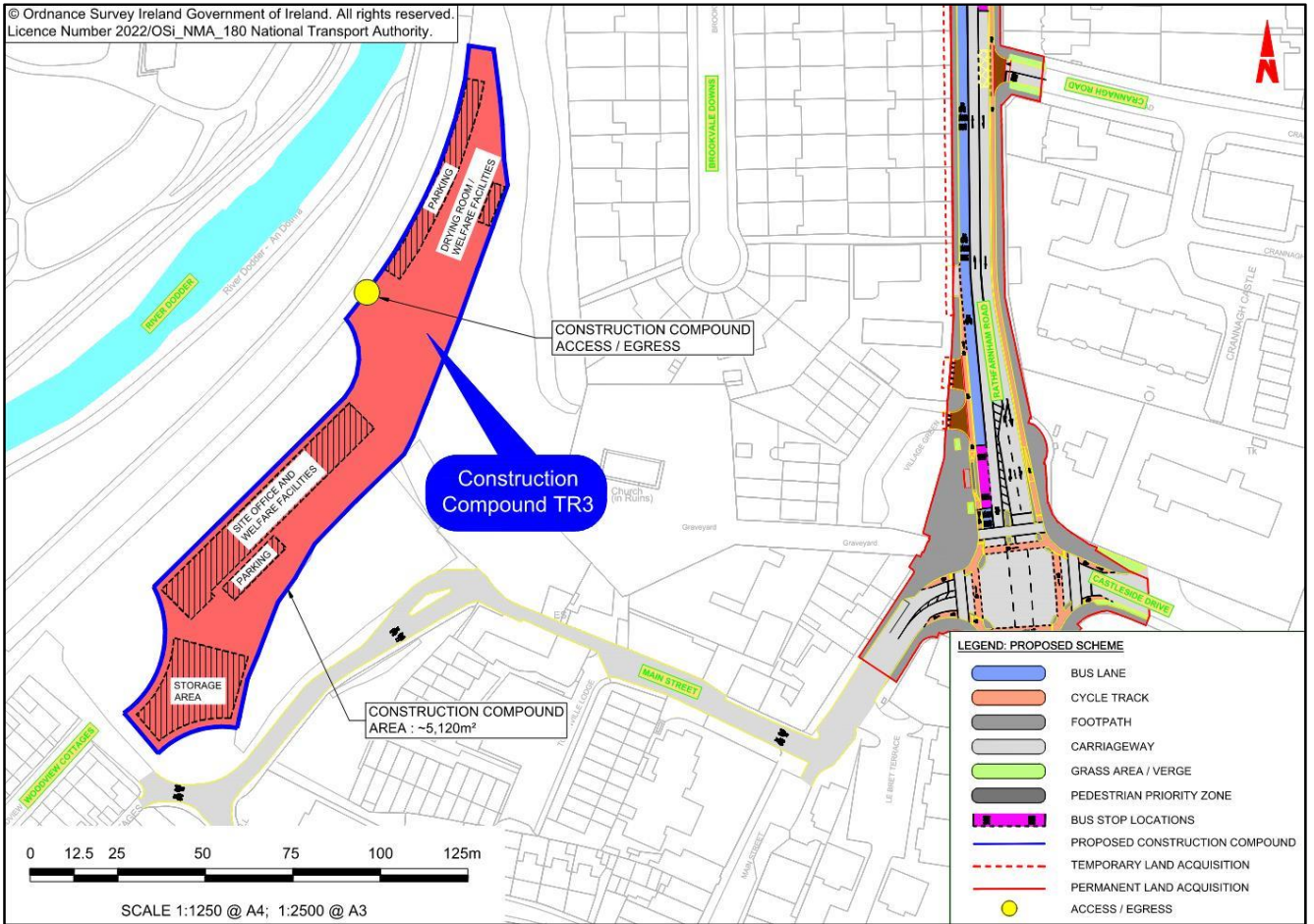


Image 7.3 Location and Extent of Construction Compound TR3

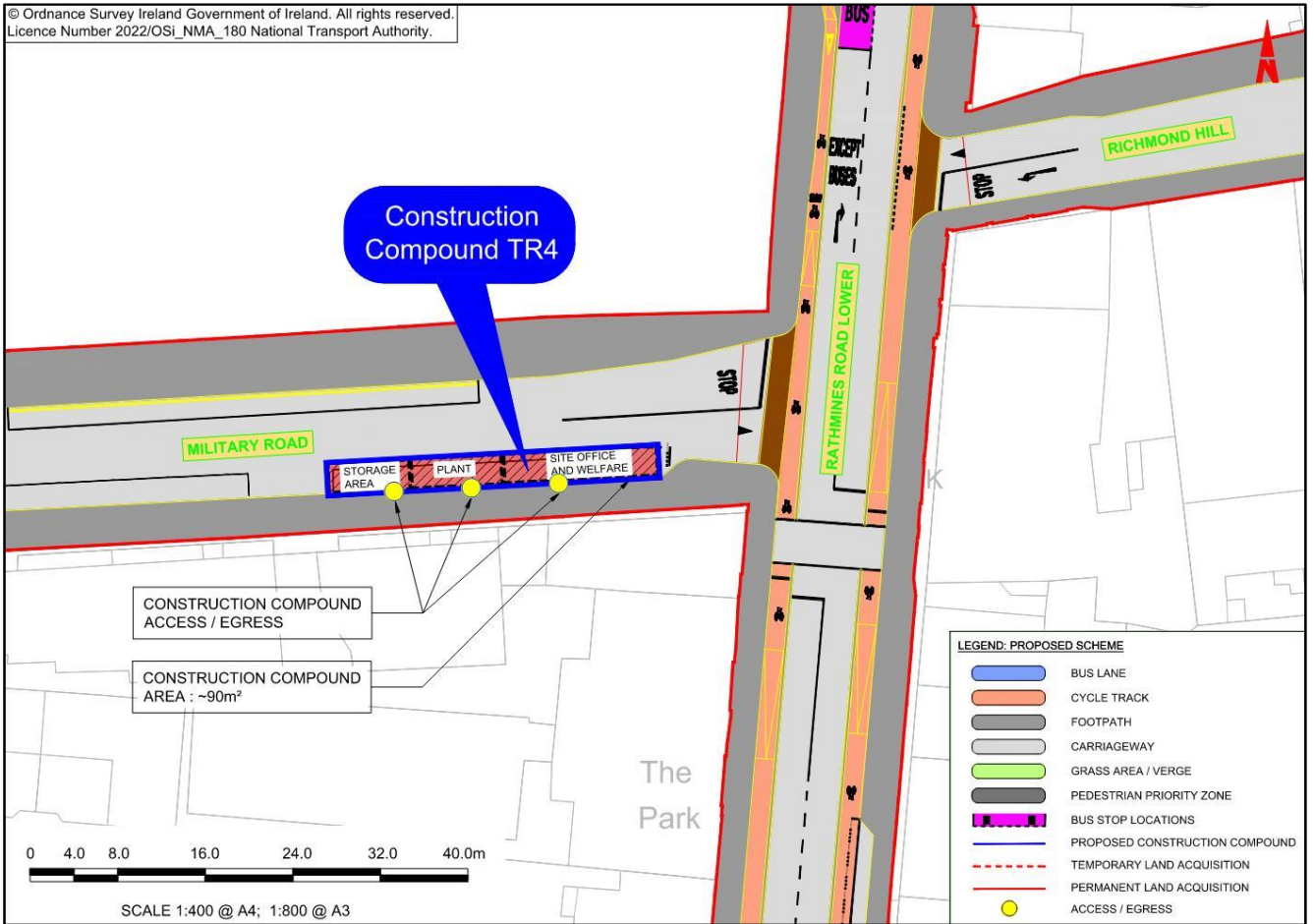


Image 7.4 Location and Extent of Construction Compound TR4

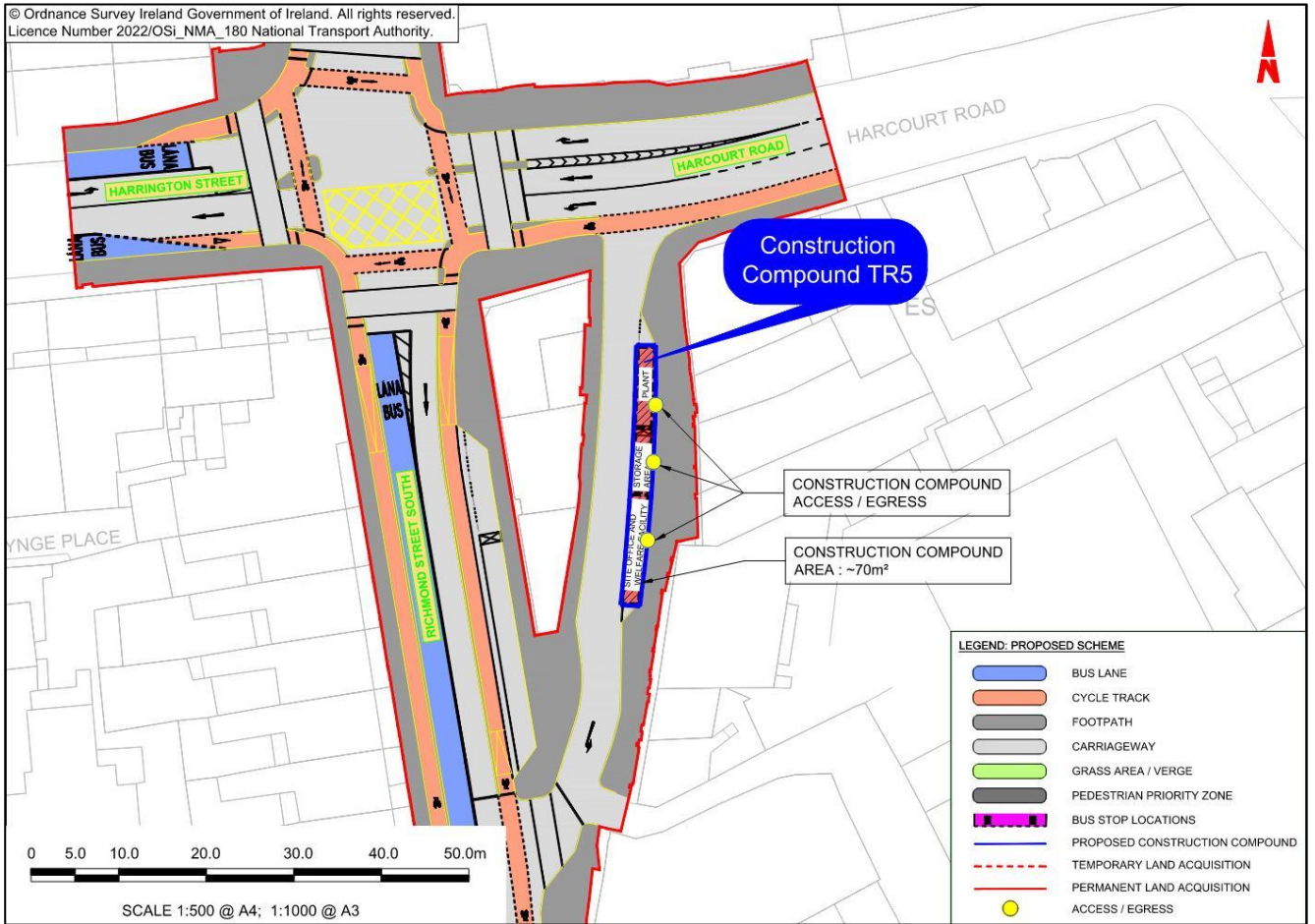


Image 7.5 Location and Extent of Construction Compound TR5

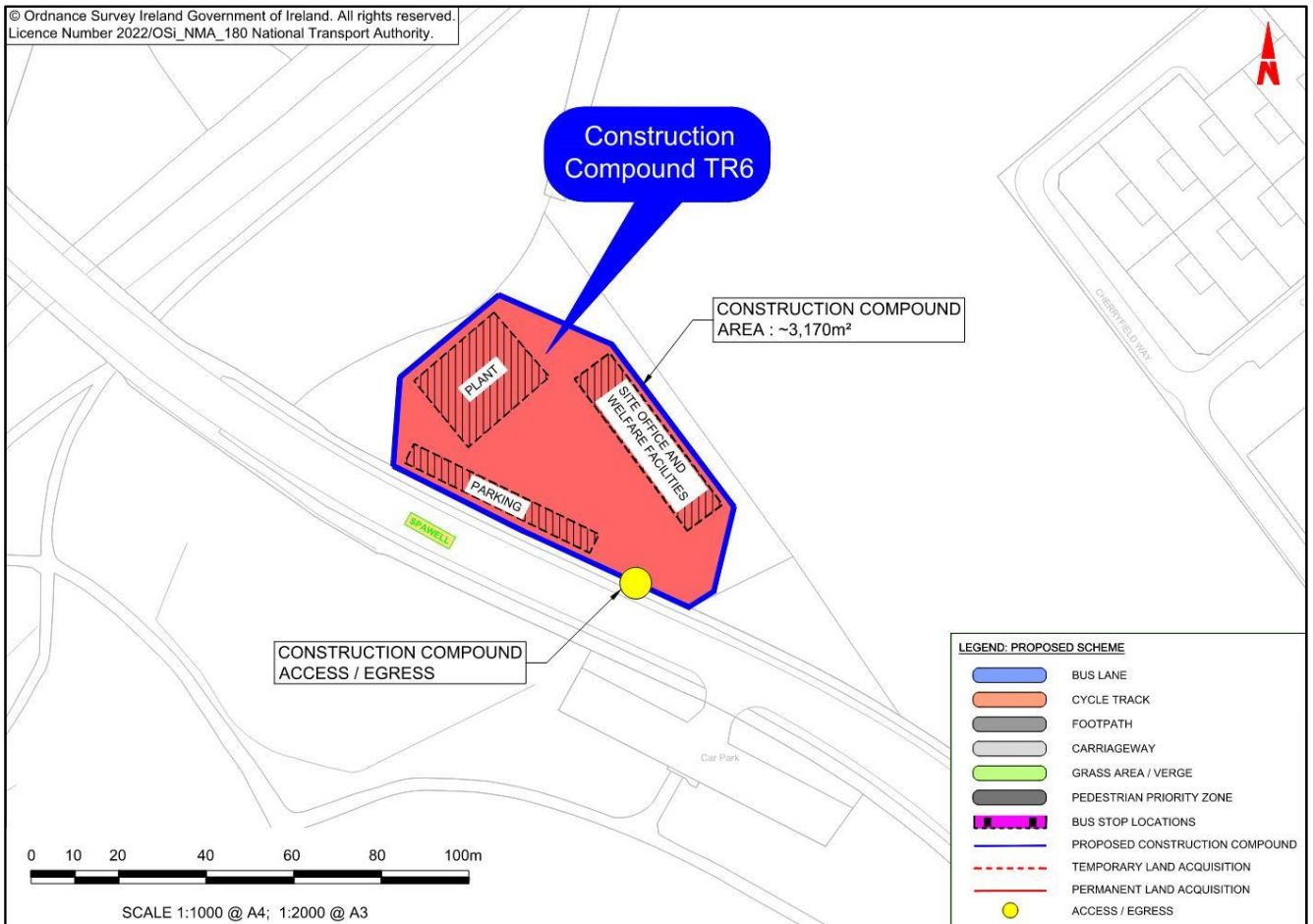


Image 7.6 Location and Extent of Construction Compound TR6

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

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

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

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

- Traffic & Transport;
- Air Quality;
- Climate;
- Noise & Vibration;
- Population;
- Human Health;
- Biodiversity;
- Water;
- Land Soils Geology & Hydrogeology;
- Archaeological & Cultural Heritage;
- Architectural Heritage;
- Landscape (Townscape) & 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 network, and 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 as a result of the Proposed Scheme.
- The modelling-based assessment addresses:
 - **People Movement:** An assessment has been carried out to determine the potential impact that the Proposed Scheme will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the Proposed Scheme during the Operational Phase;
 - **Bus Performance Indicators:** The changes to the projected journey times and reliability for buses as a result of the Proposed Scheme; and

General Traffic: The direct and indirect impacts that will occur for the general traffic conditions on the Proposed Scheme and surrounding road network. For the Construction Phase temporary traffic management arrangements will be prepared in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks'. Measures to minimise the impacts associated with the Construction Phase will be implemented. A Construction Stage Mobility Management Plan, as described in the CEMP, will be prepared by the appointed contractor to encourage its personnel to travel to site by sustainable modes.

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

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

- **Pedestrian Infrastructure:** Overall, the improvements to the quality of the pedestrian infrastructure will have a Positive, Significant and Long-term effect in all four sections of the Proposed Scheme;
- **Cycling Infrastructure:** Given the quality of the existing cycling infrastructure along the Proposed Scheme, the improvements will have a Positive, Significant and Long-term effect in Section 3 of the Proposed Scheme and a Positive, Moderate and Long-term effect in Section 1, Section 2 and Section 4 of the Proposed Scheme;
- **Bus Infrastructure:** The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will have a Positive, Very Significant and Long-term effect in Section 1, a Positive, Significant and Long-term effect in Section 2 and Section 3 and a Positive, Moderate and Long-term effect in Section 4 of the Proposed Scheme;
- **Parking and Loading:** Given the nature of the loss in parking (i.e. predominately low use informal parking on sections of road where properties and businesses have off road parking) and the availability of alternative spaces in the indirect study area, the impact is expected to have a Negligible and Long-term effect in Section 2 and Section 3 and a Negative, Slight and Long-term effect in Section 4 of the Proposed Scheme;

- **People Movement:** Overall, it is anticipated that the increases to the total number of people travelling along the Proposed Scheme 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 for bus users along the Proposed Scheme will have a Positive, Very-Significant and Long-term effect; and

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, Moderate and Long-term effect whilst the impact of the redistributed general traffic along the surrounding road network will have a Negative, Slight and Long-term effect. Thus overall, there will be no significant deterioration in the general traffic environment in the study area. The Proposed Scheme will deliver positive impacts to the quality of pedestrian, cycling and bus infrastructure during the Operational Phase, improving people movement in line with the scheme objectives. These improvements will help to provide an attractive alternative to the private car and promote changes from the use of private cars to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the sustainable movement of people as population and employment levels grow in the future. The scheme design has been developed with cognisance of the relevant accessibility guidance and universal design principles so as to provide access for all users.

Although it is recognised that there will be some negative impacts for general traffic and parking / loading availability, the Proposed Scheme has been designed 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 have not been considered beyond those already incorporated as part of the Proposed Scheme. The impacts to general traffic and parking / loading, including mitigation measures are incorporated into the Proposed Scheme and no further mitigation measures are considered to be required.

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 along most parts of the Proposed Scheme meets National and European Union air quality standards. However, the annual mean limit value for Nitrogen dioxide (NO₂) was exceeded at monitoring locations on R105 Burgh Quay, R110 Kevin Street Lower, R111 Canal Road, R114 Aungier Street /Camden Street Lower/Rathmines Road Lower/Richmond Street South/South Great George's Street, R137 Clanbrassil Street Lower/ Clanbrassil Street Upper/Dame Street/Harold's Cross Road/New Street South/Tallaght Road, R138 Leeson Street Lower, R148 Aston Quay/Wellington Quay and R811 South Circular Road and Bride Street 2019.

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 assessment concluded that Construction Phase traffic emissions will be neutral and short term overall in the study area.

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

No mitigation measures are required during the Operational Phase as the assessment identifies a generally negligible or beneficial impact on air quality in the vicinity of the Proposed Scheme. Some significant (moderate) adverse impacts have been identified at R137 Clanbrassil Street Lower junction with the R811 South Circular Road in 2028, where both baseline and future baseline NO₂ concentrations are modelled above or near the annual mean limit (40 µg/m³) for NO₂. However, these impacts are predicted to reduce to negligible by 2043. The assessment concludes that the overall the impact on air quality along the Proposed Scheme will neutral and long-term.

8.3 Climate

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

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

The impacts assessed during the Construction Phase included emissions from activities such as site clearance, utility diversions, road widening and excavation works (where required), works at junctions and landscaping. Construction traffic routes are also assessed as part of the assessment. Construction traffic and the embodied carbon (i.e., the total energy required to make / produce and product of services) for any construction materials required will be the main sources of greenhouse gas emissions during construction.

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

The Proposed Scheme is estimated to result in total Construction Phase greenhouse gas emissions of approximately 4.3 kilotonnes embodied 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 0.004% of Ireland's non-Emission Trading Scheme 2020 target.

Following the application of the mitigation measures, it is expected that there will be a negative, minor and short-term residual impact on climate as a result of the Construction Phase of the Proposed Scheme.

The Proposed Scheme will be an enabler to allow for further reductions in car mode share with corresponding transfer to public transport, walking and cycling modes. This can be achieved through signal optimisation, increased bus frequency, further growth in cycling and demand management measures. A greater increase in sustainable mode share would 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 15,590 and 11,470 car trips per weekday from the road network in 2028 and 2043. This has the effect of a reduction in total vehicle kilometres, a reduction in fuel usage, and increases to sustainable transport trips and modal share in accordance with the 2023 Climate Action Plan.

The maintenance GHG emissions associated with the Operational Phase of the scheme is predicted to generate 1.04kt CO_{2eq} over the predicted 60-year lifespan. Following the implementation of mitigation, this impact is predicted to be Negligible and Permanent.

The operational traffic greenhouse gas emissions associated with the Operational Phase of the scheme is predicted to be Negligible and Permanent. Overall, when the carbon emissions associated with the maintenance phase and the Operational Phase are combined, the net greenhouse gas emissions will be Negligible and Permanent.

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

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

8.4 Noise & Vibration

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

The baseline surveys determined that currently the main source of noise within the study area is road traffic with a small contribution from local urban and suburban sources such as pedestrian movements and commercial activities. There are no notable sources of vibration in the surrounding environment. Road traffic along the existing road network generates a negligible level of vibration that would not be perceptible to building occupants.

The 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.

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

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

Following the application of these mitigation measures, it is expected that noise impacts associated with the Construction Phase will be Negative, Not Significant to Moderate, and Temporary during all key construction phases during daytime periods. During evening periods, noise impacts associated with the Construction Phase will be Negative, Not Significant to Significant and Temporary within 15m of the works depending on the specific activities. With the adoption of best practice methodologies, vibration impacts at the most sensitive premises can be adequately mitigated to within acceptable levels relating to disturbance.

The Impacts assessed during the Operational Phase relate to changes in traffic noise levels along the Proposed Scheme as a result of reconfigured cross sections, to include new or upgraded bus lanes and predicted changes in traffic movement. The Proposed Scheme aligns with policy objectives to reduce populations exposure to traffic noise across the city through the incorporation of improved public transport, and increasing bus, train, and bicycle journeys and the replacement of diesel fleet to electric and natural gas fleet. Once operational, there will be a Direct, Positive, Imperceptible to Slight impact along the Proposed Scheme due to a reduction in traffic volumes during both the Opening Year (2028) and the Design Year (2043).

During the Opening Year (2028), increased traffic noise levels will occur along a small number of roads adjacent to the Proposed Scheme as a result of traffic re-distribution during daytime periods. During this initial short to medium term phase, an indirect, positive, imperceptible to slight and short to medium-term to indirect, negative, moderate and short to medium-term impact is calculated.

During the Design Year (2043), increased traffic noise levels will occur along a small number of roads adjacent to the Proposed Scheme as a result of traffic re-distribution during daytime periods. During the long-term phase, residual impacts are calculated as indirect, positive, imperceptible to slight and long-term to indirect, negative, slight to moderate and long-term.

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

8.5 Population

The population assessment considered impacts on residential properties, community facilities and commercial businesses within the study area. The Population study area comprised 16 community areas, Knocklyon, Firhouse, Tallaght Tymon, Willington, Templeogue, Ballyroan, Rathfarnham, Churchtown, Terenure, Rathgar, Harolds Cross, Rathmines, Harrington Street, Francis, Street; Whitefriar Street; Meath Street and Merchants Quay.

The Templeogue Section of the Proposed Scheme will commence in the community area of Tallaght Tymon, east of the M50 interchange. This Section is predominantly residential in nature and passes by a number of housing estates and individual houses in the community area of Templeogue. The Proposed Scheme will then pass through Terenure Village, in the community area of Terenure, where it will link with the Rathfarnham Section of the Proposed Scheme. The Proposed Scheme will travel through the suburban community areas of Rathfarnham, Terenure, Rathgar and Rathmines before crossing the Grand Canal into the more urban character part of the Proposed Scheme towards Dublin City Centre. As the Proposed Scheme approaches the City Centre it is lined by a mix of residential, commercial and community properties.

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

- Indirect amenity impacts on community facilities and commercial businesses from a combination of residual air, noise, traffic and visual impacts. Direct amenity impacts on commercial businesses that may impact on businesses ability to operate successfully;
- Temporary and permanent land acquisition from residential properties, community facilities and commercial businesses including reduction of front gardens, driveways, private landings and private parking spaces; and
- Changes in accessibility for walkers, cyclists, bus users and private vehicles along the Proposed Scheme and in the surrounding road network as a result of construction traffic, diversions and traffic management measures during the Construction Phase and redistributed general traffic during the Operational Phase.

The assessment concluded that there will be a Negative Significant Short-Term impact through community land take at addresses along Rathfarnham Wood, Rathfarnham Road and Fortrose Park during the Construction Phase. Localised areas were assessed to receive Negative, Slight to Moderate Temporary impacts on commercial accessibility during the Construction Phase.

In addition, positive, moderate to significant and long-term impacts are expected on walkers, cyclists and bus users in the community areas of Willington, Templeogue, Rathfarnham, Terenure, Rathgar, Harolds Cross, Rathmines, Harrington Street, Whitefriar Street and Meath Street and Merchants Quay during the Operational Phase. Access to community facilities and commercial businesses via private vehicles is expected to be a positive, moderate impact on change in access along the Proposed Scheme and a negative, moderate impact on change in access in the surrounding road network.

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.

8.6 Human Health

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

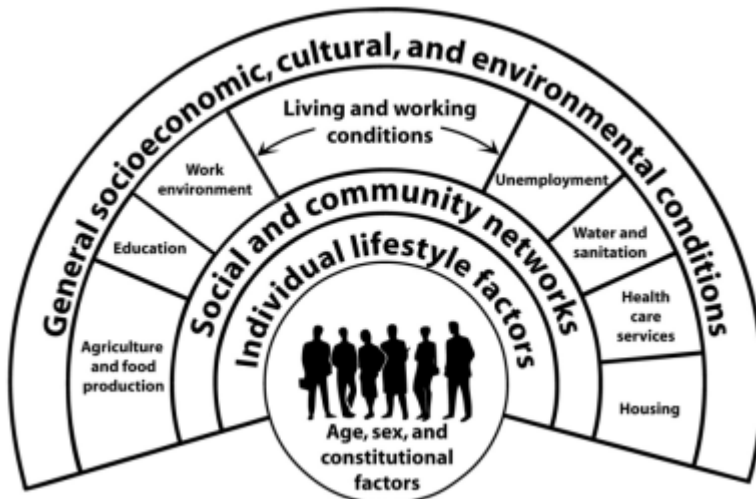


Image 8.1 Wider Determinants of Health (Source: Dahlgren and Whitehead 1991)

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

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

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

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

Temporarily increased traffic congestion because of traffic management measures and diversions during construction 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 to short-term nature of these impacts means that no lasting impact on health is likely.

There may be a requirement for some works to take place at night. This will temporarily increase the likelihood of sleep disturbance to 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 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 any European Sites, however it is hydrologically connected to Dublin Bay SAC. The nearest European sites in Dublin Bay are South Dublin Bay and River Tolka Estuary SPA and South Dublin Bay SAC, which are located approximately 2.7km downstream of the closest point of the Proposed Scheme to the Liffey Estuary Upper.

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

- Four bat species (Leisler's bat, Common pipistrelle bat, Soprano pipistrelle bat, Myotis);
- Potential Roost Features (locations where bats rest) in nine trees which are located within the scheme boundary. Five of these trees will be retained in the Proposed Scheme;
- Evidence of badgers;
- Evidence of otters in the form of spraints and potent slides along the Owenadoher River;
- No evidence of amphibians or reptiles; and
- A total of 75 breeding bird species and 30 species with breeding and wintering bird populations.

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

- Site preparation and clearance;
- Removal of existing boundaries, pavements, lighting columns, bus stops, and signage;
- Protection and / or diversion of buried services;
- Road widening, pavement reconstruction, and kerb improvements;
- Reconfiguration of traffic lanes throughout;
- Permanent land take at a number of areas across the Proposed Scheme including:
 - 74 residential properties; and
 - 38 non-residential properties or land, including commercial, healthcare and educational institutes.
- Temporary land take at a number of areas across the Proposed Scheme, in particular
 - Rathfarnham Castle boundary Wall
 - Bushy Park along the Templeogue Road
- Installation of new bus stops and junction / roundabout modification;
- Property boundary reinstatement, signage replacement; relocation of and/or installation of lighting columns; and,
- Landscaping and tree planting, and reinstatement of temporary land acquisitions

A range of mitigation measures will be implemented to avoid or reduce negative impacts on biodiversity during the Construction Phase, including retaining groups of trees identified to contain potential roost features for bats where practicable, and planting new street trees. 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 and operation will be not significant beyond the local level with no significant adverse impacts predicted for any Special Conservation Interests of any European sites.

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 the integrity of any European site.

8.8 Water

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

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

- Liffey Estuary Upper is a transitional waterbody and is within the Liffey Nutrient Sensitive Area. The Liffey Estuary Upper has a Good WFD Status and is 'At Risk' of not achieving Good Status by 2027, which means a deterioration in status is anticipated. The main risk is urban wastewater from Combined Sewer Overflows (CSOs) at Ringsend. CSOs can end up discharging raw sewage into watercourses during storm events;
- Dodder_040, is 24.25km long and consists of two main channels from Tallaght to Templeogue, and another tributary (through Tallaght) and two unnamed minor tributaries (both in Firhouse);
- Dodder_050 segment is 29.62km long, rising at Three Rock Mountain and continuing north until it flows into the Liffey Estuary. The 2019 WFD sub-catchment assessment (EPA 2019) states that the catchment contributions for both segments are considered to be primarily urban;
- Owenadoher_010 consists of branches which rise in the Glendoo and Kilakee Mountains and flow northwards through Whitechurch and Rathfarnham before converging at Willbrook and flowing into the Dodder_050;
- Grand Canal Main Line (Liffey and Dublin Bay)), which is an artificial waterbody, primarily used for recreation. Constructed in the 18th century, the Grand Canal traverses the country from Dublin to Shannon for approximately 131km.

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:

- Dodder_040: has a Poor status; is At Risk;
- Dodder_050: has a Moderate status; is At Risk;
- Owenadoher_010: has a Good status; is At Risk;
- Grand Canal Main Line (Liffey and Dublin Bay): has a Good status; is unassigned for its risk categorisation; and
- Liffey Estuary Upper: has a Good status; At Risk;

The surface water along the Proposed Scheme corridor currently drains into a surface water system which discharges into the Dodder_040, Dodder_050, Owenadoher_010 and combined sewers which are directed to Ringsend WwTP. The main existing pressure on water quality relates to urban runoff and overflows from the foul and combined sewer network.

A Flood Risk Assessment has been completed for the Proposed Scheme which determined that one part of the Proposed Scheme will be in Flood Zone A where the risk of flooding is high, one area will be within Flood Zone B.

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

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

Surface water management is addressed in the CEMP, which details control and mitigation measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Scheme. These include a requirement for an environmental incident response plan; the control of runoff of fine sediments; the management of storage of materials / fuels, and the management of vehicles and plant. Additionally, site specific measures are proposed to avoid or reduce negative impacts related to the Construction Compound locations at Dodder View Road.

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

The impacts assessed during the Operational Phase include the potential surface water impacts associated with areas of impermeability and traffic displacement. During the Operational Phase, the design of the Proposed Scheme will ensure that there will be no net increase in surface water runoff rates to any of the connected waterbodies, using a combination of sustainable drainage systems in the form of 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 and geology and hydrogeology assessment involved 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 brown mineral soils which are underlain by limestone rock. The land within the study area is mainly used for urban developments, including but not limited to; industrial, commercial, residential, and recreational. Moving away from the City Centre there are also marine, agricultural, and forested areas in the region.

Aquifers (which store / produce groundwater) within the study area of the Proposed Scheme are classified as 'Locally Important' (moderately productive in local zones).

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/contamination of parts of an aquifer; and
- Change to groundwater regime.

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

The Proposed Scheme is routed along existing roads, through a heavily developed suburban and urban landscape. The Proposed Scheme route is bordered by items of archaeological and cultural importance. The Tallaght Road to Rathfarnham Road section will pass by the City Watercourse, which was of importance to the medieval city's water supply. Along this section of the route is a number of ecclesiastic remains, such as a churches, graveyard and graveslabs. There are three cultural heritage sites along this section of the Proposed Scheme, a modern memorial statue of the Virgin Mary, a stone depot related to the construction of the then New Riad from Terenure to Templeogue and the former street pattern of Terenure which is preserved in the layout of the buildings.

Rathfarnham Castle, a national monument within state ownership, is located along the Nutgrove to Terenure Road North Section of the Proposed Scheme, the existing boundary wall, along the roadside will be demolished and reinstated to accommodate the new proposed road layouts. There has been records of several stray finds of artefacts along this section, including finds within the River Dodder and surrounding The Mill House.

There are two recorded archaeological monuments along the Terenure Road North to Charleville Road section of the Proposed Scheme, Rathgar Castle and its associated Gateways. Terenure and Rathgar were prosperous throughout the 19th and 20th centuries and historic street art are located throughout the section. A tramway once ran through the area from Terenure through Rathgar and Rathmines to Nelson's Pillar, the remains of the tramway station house have now function as a supermarket.

Through from Charleville Road to Dame street is bordered by areas of historical and cultural heritage importance, Town Defences located at Wexford Street and Redmond's Hill are protected National Monuments. There are thirty five recorded archaeological monuments within 50m of the Proposed Scheme, all but two are located with the Zone of Archaeological Potential for the Historic City of Dublin. Much of Dublin city is under the historic influence of its ecclesiastic and Viking past which can be seen throughout the city. Previous investigations along South Great George's street revealed Viking habitation and associated burials, while also along the street are two churches, once of which was the medieval parish church of St. George.

There are three National Monuments, twelve archaeological heritage features on the Records of Monuments and Places / Sites and Monuments Record (not also considered to be National Monuments), seven non-designated archaeological sites, and ten cultural heritage sites (not otherwise designated) 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; and
- Any excavations of soil, including landscaping works and ground disturbance for utility works.

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

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

8.11 Architectural Heritage

The architectural heritage assessment included a desk-based study, comprising 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 Rathfarnham to City Centre Section commences on the R821 Grange Road at the junction with Nutgrove Avenue. The remains of the Demesne of Rathfarnham Castle are located on the east side. Though the demesne has been much reduced in size, it has been retained as a public park surrounding Rathfarnham Castle, a National Monument in State ownership. It is situated within Rathfarnham Castle Park, separated from the wide modern roadway by a boundary of railings / rendered wall and mature trees. The structure is visible from the roadside through the railings that line this part of the boundary.

The castle was built in the late 16th century but was remodeled in the 18th century and was refurbished in the 20th century. Rathfarnham Village lies to the west of the Proposed Scheme and much of it is within the Rathfarnham Architectural Conservation Area. Structures of interest which are located within it and which adjoin the Proposed Scheme include the Church of the Annunciation, the Yellow House and St Bridget's Willbrook Rd. Castle Lodge Rathfarnham Road is just outside the centre of the village and is a Protected Structure. At the Dodder the Proposed Scheme crosses Pearse Bridge.

On the Rathfarnham Road architectural heritage features includes two Protected Structures, the Rathfarnham War Memorial Hall and a Bank at 1 Rathfarnham Road. There is also a watermill, in addition to Cormac Terrace a group of Tram Worker's cottages and an associated depot. The only identified trace of the Tramways themselves were tram standards on the Terenure Road North and Harrold's Cross Road, which were associated with the number 16 and number 17 Trams, which ran from Whitehall to Rathfarnham and Terenure via Harold's Cross. Both routes opened in 1879 and were electrified in 1899. The line closed in 1939. The number 15 Tram ran from Nelson Pillar in O'Connell Street to Terenure via Rathmines. It opened in 1872 and was electrified in 1899. The line closed in 1948. No above ground remains of this tramway were identified along the proposed scheme apart from the Tram Depot on Terenure Road East. Cormac Terrace on the Rathfarnham Road were built as tram workers cottages and are included in the DCIHR as is a tram shed located to the rear of number 21 Cormac Terrace. There are a number of other sites of Industrial or technical interest on the Rathfarnham Road which include a former Telephone Exchange at number 11, and the sites of smithies at number 8 and number 13 Rathfarnham Road.

At Terenure village, a single lane cycle track will be provided in each direction along Terenure Road North, while the Proposed bus corridor will run along Terenure Road East. No Protected Structures were identified on Terenure Road North but Rathmore Villas is a terrace of Tram Workers Cottages and are included in the DCIHR as is the former Tram Depot on Terenure Road East. The proposed cycletrack continues along the Harold's Cross Road. Numbers 368 to 378 are Protected Structures, as is number 201, and Waverly Terrace. The adjoining streets such as Leinster Road also contain a large number of Protected Structures. Terenure Road East contains a large number of Protected Structures, which mainly consist of 19th century houses although some shops and commercial premises were noted as was St. Joseph's Roman Catholic Church. Rathgar Road also contains a large number of Protected Structures, again mainly consisting of 19th century houses. The Rathmines Road Lower is the main thoroughfare through Rathmines Village and as with Rathgar and Terenure contains many 19th century houses and commercial buildings, including the former town hall, now a Library and college.

The Proposed Scheme crosses the Grand Canal at La Touche Bridge on to Richmond South. Richmond South contains both 18th and 19th century houses, pubs, and commercial buildings. Camden Street also contains a small number of Protected Structures, again mainly 18th and 19th century houses, pubs and commercial buildings, as does Wexford Street. The Bleeding Horse Pub is also a recorded Monument.

Aungier Street cuts through an early Christian enclosure which contained the Churchyard or Peter on the Mount. Aungier Street is one of Dublin's oldest thoroughfares, laid out in 1661 as a high class residential suburb by Francis Aungier, First Earl of Longford as the main street of the Aungier Estate. Most of the buildings are 18th or 19th century in date but there are a 4 or 5 which are 17th century but have been masked by later modifications to their facades. Two of the houses including number 12 are 16th or 17th century. Stephen Street is named after a leper hospital and the church of St. Stephen dating from the 12th century and retains its largely late medieval layout. Surviving historic buildings are of 18th and 19th century date but may contain earlier fabric. The Proposed

Scheme continues up South Great Georges Street, most of which is within the South City Retail Quarter ACA which contains a large number of 18th but mainly 19th century commercial buildings, including the South City Markets, built in 1878 to the design of Lockwood and Mawson.

Dame Street takes its name from a dam built across the River Poddle to provide water power for milling, and is so called on Speed's map of 1610. In the 14th century was also known as "the street of Theng-mote" or Teyngmouth Street. The street was widened by the Wide Streets Commission in 1769 and developed into the city's financial centre with bank buildings constructed in the 19th century.

The Templeogue to Terenure section of the Proposed Scheme Bus Corridor will commence at the Tallaght Road, close to the Old Bella Vista Paper Mill. It passes the Spawell House which once had a demesne. The old Templeogue Church and graveyard is located on the corner of Wellington Lane and is an early 18th century church built within a medieval churchyard. Further along the Templeogue Road is a freestanding arch. It is located along the old City Watercourse, which was important for the supply of water to the medieval city. An open aqueduct was constructed to divert water from the River Dodder to the River Poddle (which has long been culverted and now flows underground), thus increasing the water supply for the City Watercourse. A section of the City Watercourse coincides with the Proposed Scheme where it travels east and west of the Wellington Lane Roundabout.

A number of country houses and the remains of their demesnes are located on the route. They include Cheeverstown House and Templeogue House. There is a Weir on the Dodder River at the crossroads with the Old Bridge Road. Further along the Templeogue Road there are a number of houses which are of interest these include a 19th century house at number 291, Riverside Cottages which are within an ACA, an Art Deco Style house at Number 245, Fortfield Lodge, Bushy Park House, and the forge House 26 Templeogue Road. Terenure College does not contain any Protected Structures but there is a recorded monument, a castle site in the grounds. The Templeogue to Terenure section of the Proposed Scheme meets the Rathfarnham Scheme at Terenure village which was known as Round Town in the 19th century owing to the Crescent or Circus of buildings located at Templeogue Road and Terenure Place. Only a small portion of this Crescent survives.

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

- Direct impacts to the boundaries (plinth, 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 mitigation 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 adverse 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

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

Along the section of the Proposed Scheme from Tallaght Road to Rathfarnham Road the townscape has a peri-urban character, which is predominately composed of rural/ recreational landscapes transitioning to residential suburbs. The streetscape is dominated by a significant dual carriageway road corridor leading from the M50 motorway. There are recreational areas and open spaces of landscapes with a natural river valley which becomes more enclosed as approaching Templeogue Village. Residential suburbs exist to either side of the dual carriageway east of Spawell Roundabout. A graveyard and church ruin are openly situated in open space adjacent to the road. The road corridor is generally enclosed by young tree planting on the northern side. Mix of planting and residential / institutional (Cheeverstown Care Centre) boundary walls present to the south. A managed hedgerow is located in the median. An historic stone arch (Templeogue Arch) was previously lost in heavy vegetation to immediate north of road, but has recently been cleared. New infill residential development to south of road approaching Templeogue Village. There are a number of protected structures along the route including an Old Stone Archway, graveyard and Cheeverstown House.

From the Old Bridge Road / Cypress Grove Road Junction to Templeogue Village to Rathfarnham Road This character of this section is of outer city village to inner city village via historic city road corridor. Primarily residential areas with local retail uses / services at the village centres. The route contains a mix of local services and residential uses. There is limited street tree planting but major open spaces and mature trees along substantial sections.

From Nutgrove Avenue Junction to Terenure Road North the Townscape Character is of an outer residential suburb character, of predominantly two-storey buildings, with traditional urban village mainly along a historic road corridor. Rathfarnham Bypass is a significant infrastructure in the background fabric of area. Many properties are elevated above the road. Within Rathfarnham there are a number of modern apartment and residential properties. There are areas of significant open space – linked to Rathfarnham Castle, and the corridors of the Owenadoher River and the River Dodder – with stands of early mature and mature trees. There are a number of conservation areas along the section including, Rathfarnham Village which is an architectural Conservation area, the River Dodder which is a conservation area and amenity areas at Rathfarnham Castle. There are a number of protected structures along this section of the scheme.

From Terenure Road North to Charleville Road character can be described as of residential inner-city suburb, of predominantly two-storey buildings, including a traditional urban village centre. The section is lined by two-storey / three-storey terraces, most of redbrick or redbrick and render with established front gardens with driveways, and mature trees. Property boundaries are a mix of brick walls and piers, rendered walls and railings. There are a number of prominent mature specimen trees along Terenure Road East which contribute strongly towards the streetscape character. Between Terenure Road East and Rathgar Road there is a significant number of protected structures.

From Charleville Road to Dame Street the surrounding townscape is Inner city village and urban in character. The corridor is lined by two-storey terraces and urban terraces with limited modern apartment developments. Boundary walls are a mix of railings, piers, brick walls and stone copings. Along the section is a significant number of protected structures as well as Architectural conservation areas and Grand Canal corridor designated open spaces.

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.

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. Temporary fencing / hoarding will be erected and access to property for the owners / occupiers will be maintained for the landowner as far as reasonably 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 (RPA) of trees to be retained will follow a project specific arboricultural methodology for such works.

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

With the implementation of the proposed mitigation measures, it is expected that there will be moderate to very significant, negative, temporary to short-term impacts on all townscape sections of the scheme during construction. There will be moderate to very significant, negative, short-term streetscape / visual impacts on Architectural Conservation Areas, protected structures, amenity designations, preserved views, trees and vegetation and properties in temporary acquisition. There will also be moderate, negative, short-term landscape/visual impacts on Conservation Areas, while properties fronting the scheme will have moderate to very significant impacts during the construction phase.

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

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

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. Therefore, these changes may be considered part and parcel of on-going or regular changes that may be expected to occur, and do occur, from time to time in any urban streetscape environment and such changes are considered as a low or negligible magnitude of change.

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 Compound, return of temporary acquisition areas, and for additional tree and other planting where possible along the Proposed Scheme.

In the Operational Phase localised residual effects will remain for properties, including protected structures, experiencing permanent land acquisition. There will be overall positive effects for all sections of the scheme, excluding Nutgrove to Terenure Road North, which will have a neutral effect. The Proposed Scheme provides for improvements in the urban realm, which will provide positive long-term effects for the townscape and visual character, most notably at centres of Rathgar and Rathmines and along the route from Grand Canal to Dame Street. The restoration and reincorporation of Templeogue Arch into the streetscape will also be a notable improvement. The Proposed Scheme will also provide for a significantly enhanced level of service for public transport and for pedestrian / cycle connectivity.

8.13 Waste & Resources

This waste and resources assessment included identifying the types of waste that could be generated by the Proposed Scheme, as well as the potential for reuse of materials. 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 The Circular Economy Model (Source: Circular Economy in Europe: Developing the knowledge base (European Environment Agency (EEA) 2016)

In Ireland, the most recently available published data records 8.2 million tonnes of construction and demolition waste was generated in 2020. This represented a decrease of 0.6 million tonnes from 2019. Of this waste, 7.0 million tonnes comprised soil and stones, and these make up 84% of the current construction and demolition waste stream.

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

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

- Construction and reconstitution of cycleways, pathways, road widening and urban realm improvements;
- Removal of trees, concrete kerbs, walls, fences and gates;
- Modification to minimising junctions;
- New street furniture, including traffic lights and bus stops, and landscaping works;
- Minor utility diversions and / or protections will be required; and
- Excavation of pavements and carriageways.

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

The approximately 3,220 tonnes of demolition waste that will be generated as a result of the Proposed Scheme is equivalent to 0.03% 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 66,000 tonnes and is equivalent to 0.56% 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 Authorities and in accordance with their waste management plans. No additional mitigation or monitoring measures are considered necessary. The quantity of bitumen containing material generated, during the Operational Phase, over the assumed lifetime of the Proposed Scheme (assumed to be 60 years), will increase by approximately 8,500 tonnes. The predicted impact of operational construction and demolition waste will neutral, and long-term.

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

8.14 Material Assets

- The material assets assessment was considered in terms of:
- Major utilities (both underground and overground) such as gas, water pipelines (drinking water pipelines and sewers) and storm water networks, electricity transmission lines and telecommunications lines;
- Manmade transport infrastructure such as roads, rail and canals; and
- Raw materials that are required to be imported for the Proposed Scheme.

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

Existing material assets within the Proposed Scheme include:

- Electricity Supply Board electricity lines (high, medium and low voltage) and associated infrastructure;
- Gas Networks Ireland gas mains (high, medium and low pressure) and associated infrastructure;
- Irish Water potable water mains and associated infrastructure;
- Irish Water sewer lines (foul and combined sewers) and associated infrastructure;
- Local Authority surface water drainage network and associated infrastructure;
- Eir, Enet and Virgin Media telecommunications lines and associated infrastructure;
- Local Authority traffic signal ducting and associated infrastructure; bridges and gantry signage, and Road Authority traffic signal, street lighting, Intelligent Transport Systems (ITS) & CCTV ducting and associated infrastructure;

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;
- Relocation of some traffic signals;
- The diversion of underground watermains where there will be interfaces with the Proposed Scheme works;
- Upgrade works required to the surface water drainage network to accommodate for new road layouts and increased hardstanding;
- The diversion of gas infrastructure where there will be an interface 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 only 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 major utility infrastructure, wherever possible. Where there will be a clash with existing utility infrastructure, these will be protected in place or diverted to prevent long-term disruption to services. Diversions and changes to the location or layout of any utility infrastructure have been accounted 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 in advance with prior notification given to the impacted property owners.

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

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

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

- The requirement for electricity connections for new lighting, for bus stop information and for junction signalling;
- 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 Operational Phase impacts on gas and water infrastructure. Due to the measures included in the design of the Proposed Scheme and the fact that there are minimal impacts predicted during the Operational Phase, no specific mitigation measures are required.

8.15 Risk of Major Accidents and / or Disasters

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

The risk assessment:

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

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

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

For the Construction Phase, there were several risks that were deemed low and were not considered further. The following high 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; and
- Disruption to emergency response vehicles (fire, ambulance and guards).

The following medium level risks were identified for the Construction Phase:

- Risk of gas explosion due to striking underground gas mains during excavation works;
- Risk of structural damage / collapse of relocated structures;
- Risk of major road traffic accident resulting from a collision between construction traffic and public traffic, pedestrian and cyclist;
- Risk of accidents due to interface of construction works with other public transport infrastructure;
- Risk of spread of non-native invasive species during construction works, particularly during site clearance; and
 - Risk of extreme weather events.

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 (Placeholder for 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;
- 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.

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

The Landscape (Townscape) and Visual assessment identified the potential for temporary indirect cumulative townscape and visual effects to occur for some projects if the construction periods coincide or are successive with the Proposed Scheme. Effects would be not significant if this is not the case. These effects are most likely to occur at locations where concurrent construction of both schemes have the potential to overlap, however, it is also likely that the extent of any such impacts will be localised and contained.

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.

The Core Bus Corridor Infrastructure Works will also support the delivery of government strategies outlined in the 2023 CAP 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 in the assessment, it is concluded that the Core Bus Corridor Infrastructure Works achieves the project objectives in supporting the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets. The Core Bus Corridor Infrastructure Works has the potential to reduce 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.

The Human Health assessment identified that the proposals for projects including , the DART+ Tunnel Element and the Greater Dublin Area Cycle Network Plan, would be complementary to the Proposed Scheme and could have a cumulative, beneficial effects by connecting different communities and destinations which would improve general accessibility to areas of leisure and employment. These cumulative impacts would result in positive effects in mental health, assessed to be Positive and Significant in the Long-term on health. A similar cumulative effect was identified for the Potential Metro South Alignment, assessed to be Positive and Moderate in the Long-term on health.

The only other significant operational cumulative impacts identified over and above the standalone scheme relate to human health. It was assessed that the proposals for the other 11 Core Bus Corridor schemes would also be complementary to the Proposed Scheme 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 that the Kimmage to City Centre Core Bus Corridor in conjunction with the Proposed Scheme during operation has potential to provide long-term enhancement to streetscape where the two projects intersect. There is potential for Positive, Significant, Medium to Long-term cumulative effects on townscape.

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.templeogue/rathfarnham.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.templeoquerathfarnhamscheme.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.