

**BusConnects Galway:
Cross-City Link
(University Road to
Dublin Road)**

August 2022

**Environmental
Impact
Assessment
Report**

Volume 1
Non-Technical
Summary

**BUS
CONNECTS
GALWAY**

SUSTAINABLE TRANSPORT FOR A BETTER CITY.

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1 Introduction

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the BusConnects Galway Cross-City Link (University Road to Dublin Road) (referred to as the Proposed Scheme throughout this NTS). The Proposed Scheme will support integrated sustainable transport usage through infrastructure improvements and transport management measures 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 will ensure that public transport services can access key areas such as the retail and recreational centre of the city; public transport hubs at the rail and bus stations; City and County Halls; along with the city centre hotels and Bed & Breakfasts on College Road to the east of the city centre and key areas such as University Hospital Galway, NUI Galway, the Sportsgrounds and Galway Cathedral.

The Proposed Scheme comprises the ‘Cross-City Link’, supporting sections of the ‘Inner-City Access Route’ and other associated traffic management measures considered necessary to enable the introduction of the Cross-City Link.

The Proposed Scheme has an overall length of approximately 6.7km. The Cross-City Link will begin from R863 University Road at the intersection of R864 Newcastle Road. It proceeds along R863 University Road, across the Salmon Weir Bridge and staying on the R863, before turning onto R866 St Francis Street / Eglinton Street, at the Galway Courthouse junction. The Proposed Scheme continues along the R866 on St. Francis Street and Eglinton Street and around the northern (R866) and eastern (R336) perimeter of Eyre Square and on to R339 Forster Street. It then continues through the Fairgreen Road Junction and along R339 College Road as far as the junction with Lough Atalia Road. From here, the Proposed Scheme continues on R339 College Road to Moneenageisha junction and terminates on R338 Dublin Road immediately prior to the entrance to the Woodlands Campus for Brothers of Charity.

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

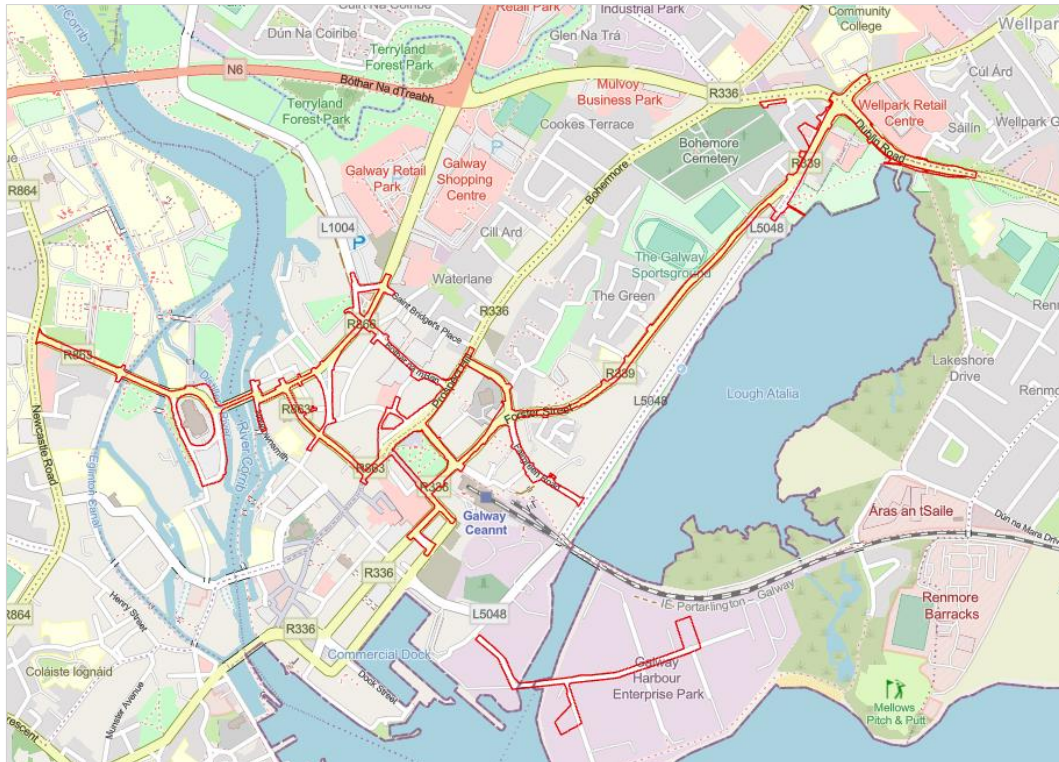


Diagram 1: Area of the Proposed Scheme (Not to scale)

The Proposed Scheme will form a central route for public transport, cyclists and will better connect places of interest for pedestrians along an east-west corridor through the city centre.

The Proposed Scheme will provide for considerable journey time reliability for existing bus services coming into and running through the city centre while also complementing the proposed new City bus network cross-city spine routes, proposed as part of the Galway Transport Strategy (GTS, 2016). The city bus network routes will be designed to coalesce along this high-quality corridor, providing high-frequency services with journey time reliability and opportunities for interchange.

The Proposed Scheme will include reconfiguration of traffic movements to facilitate improved pedestrian, cyclist and bus accessibility and movement, infrastructural works at certain roads and junctions, and improvements to the public realm at a number of locations within the city centre, including Eyre Square North, Woodquay and in the vicinity of Galway Cathedral.

1.1 Aims and Objectives

Galway City Council's strategic objectives for transport as outlined in the Galway Transport Strategy (GTS), 2016 are:

- To promote and encourage sustainable transport;
- To manage the traffic in a way which maximises mobility and safe movement; and

- To maintain and develop/upgrade infrastructure.

The Proposed Scheme aims to improve access along the corridor which will enable and deliver efficient, safe, and integrated sustainable transport movement to meet travel demand. The objectives of the overall BusConnects programme 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, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

The planning and design of the Proposed Scheme has been guided by these aims and objectives, with the need for the Proposed Scheme described in detail in Chapter 2 (Need for the Proposed Scheme) of this EIAR.

The outcomes achieved from delivering the Proposed Scheme will be:

- An attractive, resilient, equitable public transport network better connecting communities and improving access to work, education and social activity;
- Facilitate a transport infrastructure network that prioritises walking and cycling and a mode shift to public transport resulting in better air quality and reduced carbon emissions; and
- Support increased economic and social potential through integrated land-use and transport planning to reduce the time burden of travel.

1.2 Role of Galway City Council

The Proposed Scheme is being delivered by Galway City Council (GCC) and funded by the National Transport Authority (NTA) under the Sustainable Measures Transport Grant.

In the case of the Proposed Scheme, the functions of the GCC 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

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

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

- Describe the baseline conditions before any work on the Proposed Scheme has commenced;
- Describe the Proposed Scheme;
- Describe the assessment methodologies used to assess the potential environmental impacts of the Proposed Scheme;
- Describe environmental issues and any likely significant effects which may rise during the Construction and Operational Phases of the Proposed Scheme;
- Propose mitigation measures to reduce or avoid these impacts; and
- Identify the significant residual impacts which occur after the proposed mitigation measures have been implemented.

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

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

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

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

3 Need for the Proposed Scheme

3.1 Context

Private car dependence causes significant congestion, affecting our quality of life, our urban environment, and road safety. As the population of Galway City and its suburbs is expected to rise to 50-60% by 2040, with a minimum growth to 120,000 individuals, 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 overall BusConnects Programme, is identified as a component of a Strategic Investment Priority, with an associated investment commitment, which has been determined as central to the delivery of the National Planning Framework vision. Delivering the Proposed Scheme will provide the infrastructure needed to help us move from excessive dependence on private car to walking, cycling and public transport.

3.3 Climate Action Plan 2021

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

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

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

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

BusConnects is referenced as a major transport project that will help to deliver the 500,000 additional sustainable journeys by 2030. A key goal of the plan is to provide citizens with reliable and realistic sustainable transport options. The Climate Action Plan further states:

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

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

3.4 Galway Transport Strategy (GTS) 2016

The GTS (Galway City Council (GCC), 2016) is a comprehensive transport strategy for Galway City and its environs (including areas within the jurisdiction of Galway County Council), intended to establish a framework for the development of the transport network over the next 20 to 30 years. The Galway Transport Strategy (GTS) sets out proposals for the road network, public transport network, walking network and cycling network, and contains a number of significant proposals which will allow the city to continue to grow in a sustainable manner. The GTS has been adopted by both GCC and Galway County Council and is implemented through the policies of their Development Plans.

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

The Proposed Scheme supports the implementation of the Galway Cycle Network and Development Plan contained in Appendix F of the GTS as it will provide infrastructure that will support and enhance cycling as a transport mode, including the delivery of infrastructure for specific routes identified as part of the cycle network plan.

As part the GTS, the Cross-City Link Network is to be developed to achieve a continuous priority for bus movement on sections of the Cross-City Link within the metropolitan area. This is to be achieved through enhanced bus lane provisions and the removal of delays along the routes, and thus to move more quickly than cars along these routes.

The Proposed Scheme is needed to support the GTS in so far as it will provide infrastructure required to facilitate ‘*a continuous priority for bus movement on sections of the Cross-City Link network within the Metropolitan area.*’ The Proposed Scheme is needed to help realise the objectives of the GTS by making the bus a faster option for commuters than car-based transport.

According to the GTS, the development and implementation of priority infrastructure on the Cross-City Link Network is needed to ensure that delays are minimised, reliability is improved, and use of buses is made more attractive.

4 Consultation

Public participation has been an integral part of the evolution of the Proposed Scheme from the outset to seek feedback and participation throughout its development. Galway City Council has undertaken a comprehensive consultation and engagement process with stakeholders, landowners and members of the public throughout the design progression of the Proposed Scheme.

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 Proposed Scheme planning and design and to inform the development process. Stakeholder participation in the planning and design of the Proposed Scheme was encouraged from an early stage through on-the-ground engagement, information campaigns and engagement with Elected Representatives.

The early involvement of the public and stakeholders ensured the views of various groups, individuals and stakeholders were taken into consideration throughout the development of the Proposed Scheme and in the preparation of this EIAR.

The non-statutory consultation process assisted in:

- 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 assessment and design process.

4.1 Consultation Events and Stakeholders Engagement

Initial consultation with Stakeholders began in May 2017 with letters issued to 45 Stakeholders including Educational Institutions, Business Representatives, Statutory Undertakers, Public Transport Providers and Parking Providers amongst others. Follow-up face-to-face meetings with a number of these Stakeholders were held in June 2017.

Stakeholder workshops were held in relation to the Proposed Scheme, including a workshop organised by Galway City Council in relation to ongoing transportation projects within the city in October 2019. A workshop information event was also held with Cycling Stakeholders (representatives of numerous cyclist related groups) in November 2019.

A non-statutory public consultation on the emerging preferred scheme was also undertaken. The consultation commenced in October 2020 and the initial duration of the consultation period was six weeks.

Due to the reopening of the retail sector in December 2020, Galway City Council extended the non-statutory public consultation on the Cross-City Link project, to

allow the business community in the city to engage at a point in time when their busiest season would be concluded, in January 2021.

The issues raised by respondents during the consultations were further considered during the ongoing design development of the Proposed Scheme.

4.2 Consultation with Prescribed Bodies and Other Consultees

In addition to the extensive non-statutory public consultation on the Proposed Scheme, the design team undertook consultation during the preparation/development of the EIAR with prescribed bodies and relevant non-statutory consultees. Galway City Council and the design team undertook consultation and produced a report titled “Information on the Approach to Environmental Assessment”. The report was issued to prescribed bodies and relevant non-statutory consultees in October 2021 and were then invited to comment. Feedback from this consultation was also used to inform the EIAR and the preliminary design proposals, where appropriate.

Consultations were also conducted with organisations such as the National Parks and Wildlife Service (NPWS) and Transport Infrastructure Ireland (TII) and these are considered in the development of the relevant impact assessments chapters in Volume 2 of this EIAR.

4.3 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. Letters, outlining the scheme, were sent to identified landowners on 16 October 2020. Where landowners were not readily identifiable, letters were issued to the property. Landowner meetings commenced in January 2021 and have occurred across all of 2021 and into 2022. Contact has been made with representatives of the majority of potentially impacted folios. There has been ongoing engagement with landowners whose properties are affected, as design development has progressed on the Proposed Scheme. 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.

5 Alternatives Considered

5.1 Strategic Alternatives

The Proposed Scheme has been developed following careful consideration of alternatives. The GTS, and its associated Strategic Environmental Assessment, considered several strategic options relevant to the Proposed Scheme.

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

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

The GTS carried out a review of the existing transport network and future forecasts of travel demand in Galway. The assessment of travel demand and journey types concluded that, given the low-density nature of land-use development in Galway City and environs to date, the continued need for improvement in bus services as part of the overall GTS would be required. The GTS also looked at a phasing approach to the implementation of supporting and infrastructure and services in the short, medium, and longer-term over a 20-year period.

Any new public transport network proposed for Galway also needs to be cognizant of the vibrant nature of the city centre, to allow it to ‘breathe’ by removing traffic congestion and to create an attractive environment for people to access and move around. This is the concept behind the ‘Cross City Link’.

The concept for the Cross City Link therefore was to focus on the provision of infrastructure and supporting traffic management measures necessary to cater for existing and future bus services, which either approach and terminate in the city centre from the east and west or run through the city centre from either direction.

Through the work undertaken in the preparation of the GTS, 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 (BRT)
- Light Rail;

- Rail Integration;
- Metro;
- Demand Management; and
- Technological Alternatives.

The Proposed Scheme has been developed to provide a level of service similar to Bus Rapid Transit. The GTS concluded that the construction of a new heavy rail/light rail/metro alternative would not be justified by the predicted level of demand.

In addition, 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

For the purpose of development of route level scheme options and assessment of same, the Cross-City Link and Inner-City Access routes were sub-divided into a number of sub-sections. In addition to the Cross-City Link and the Inner-City Access Route, other city centre streets and routes were assessed in terms of impact and modifications needed arising from the creation of a bus priority corridor along the Cross-City Link.

Utilising the Common Appraisal Framework for Transport Projects and Programmes' (CAF) published by the Department of Transport, Tourism and Sport (DTTAS), (March 2016), assessment sub-criteria were developed, and a Multi-Criteria Analysis (MCA) carried out on options to determine the preferred scheme option within each sub-section along the route of the Proposed Scheme.

The CAF requires schemes to undergo a MCA under the following criteria;

- Economy;
- Integration;
- Accessibility and Social Inclusion;
- Safety;
- Environment; and
- Physical Activity.

In addition to the CAF criteria above, an additional criterion was applied to the Proposed Scheme in order to examine how each options aligns with Galway City Council's policies as set out in the GTS. The addition criterion titled GTS Policies was developed.

Where feasible, three options for each route sub-section section were considered.

These three options can be broadly considered in terms of the level of land take requirements and physical intervention. These categories of interventions are defined as follows:

- Option 1: Minor Interventions - Requiring no land acquisition and minimal works;
- Option 2: Moderate Interventions - Minimising land acquisition and moderate works; and
- Option 3: Major Interventions - Maximising segregated bus priority

Route scheme options were then compared based on a five-point scale, ranging from having significant advantages to having significant disadvantages over other options. Route scheme options could also be considered neutral when no apparent advantages or disadvantages are identified across all scheme options.

A qualitative appraisal of, and conclusion from, the options assessment was then provided, highlighting the key issues considered in determining preferred route sub-section scheme options ('preferred' and in some instances, and where applicable 'next preferred'). It should be noted that a balanced approach was taken when assessing scheme options, whereby a lower ranking on one criterion, for example, will not necessarily mean that the option is not suitable.

The emerging preferred scheme options from each route sub-section were then put together to provide an overall scheme option resulting in the Proposed Scheme.

Alternative options were considered in a number of areas during the design development of the Proposed Scheme. The development of the design was also 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.

5.3 Design Alternatives

Following the completion of the public consultation process in relation to the Emerging Preferred Scheme, various amendments were made to the scheme proposals to address, where practical to do so, the issues raised in submissions. Furthermore, additional design development along the proposed scheme taking into account additional information gathered. This additional design development took account of:

- New and updated topographical survey information;
- Ground investigation information;
- Landscape design amendments;
- Arboricultural design inputs;
- Further engagement with owners and developers of adjacent lands;
- Drainage design amendments;
- Ecologist design inputs.

Changes to the design and scheme description subsequent to those incorporated after the Public Consultation process include:

- The inclusion of additional cycle parking;
- Improvements to cycle permeability;
- Re-opening access to Walsh's Terrace and Corrib Terrace;
- Amendments to locations and designation of parking and loading bays;
- The provision of wider footpaths in some locations;
- Incorporation of landscaping design along R863 University Road;
- Inclusion of new drainage network along R863 University Road, petrol interceptor and outfall to Eglinton Canal;
- Incorporation of landscaping design at Galway Cathedral and amendments to pedestrian crossings and plaza layout;
- Removal of outbound bus-lane on R866 Eglinton Street;
- Relocation of pedestrian crossing and inclusion of raised table at R866 Eyre Square North;
- Incorporation of landscaping design at R866 Eyre Square North;
- Re-design of Prospect Hill area between Bóthar na mBan and R866/R336 Eyre Square to retain trees and improve public realm;
- Removal of Dock Road fronting Bonham Quay development from the scheme proposals;
- Extension of raised table at Headford Road / Woodquay and relocation of pedestrian crossing;
- Realignment of Dyke Road at Dyke Road car-park;
- Inclusion of new drainage network along College Road, attenuation tank, petrol interceptor and outfall to Lough Atalia;
- Amendments to parking provision within Moneenageisha Court development; and
- Widening of footpath / cycle track located between R338 Dublin Road and Lough Atalia.

6 Description of the Proposed Scheme

The Proposed Scheme has an overall length of approximately 6.7km. It consists of a central corridor traversing the core city centre area, which will be restricted to use by public transport vehicles, pedestrians, cyclists and local access only. It shall enable efficient and reliable public transport to and through the city centre.

The Scheme begins on R863 University Road at the intersection of R864 Newcastle Road. It proceeds along R863 University Road, across the Salmon Weir Bridge and staying on the R863, before turning onto R866 St Francis Street / Eglinton Street, at the Galway Courthouse junction. The Proposed Scheme continues along the R866 on St. Francis Street and Eglinton Street and around the northern (R866) and eastern (R336) perimeter of Eyre Square and on to R339 Forster Street. It then continues through the Fairgreen Road Junction and along R339 College Road as far as the junction with Lough Atalia Road. From here, the Proposed Scheme continues on R339 College Road to Moneenageisha junction and terminates on R338 Dublin Road immediately prior to the entrance to the Woodlands Campus for Brothers of Charity.

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 Diagram 2.

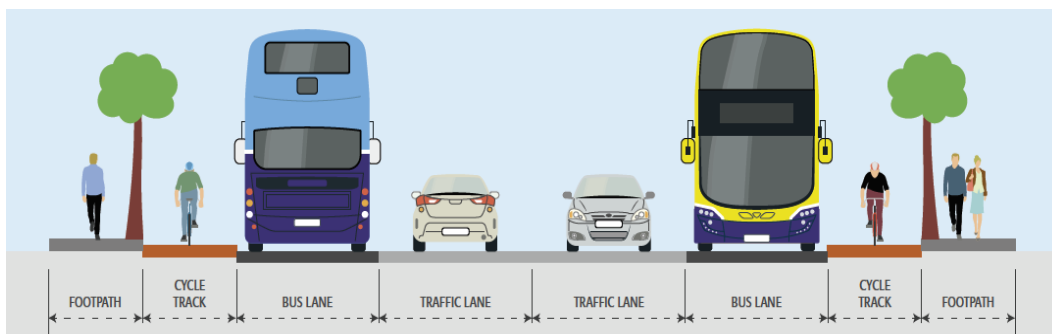


Diagram 2: Typical BusConnects Road Layout

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

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

The Proposed Scheme is described in the following eleven route sub-sections as follows and as shown on Diagram 3:

- R863 University Road to R866 St. Francis Street;
- R866 St. Francis Street and R866 Eglinton Street;
- R866/R336 Eyre Square to R339 Forster Street;
- R339 College Road (R339 Forster Street to Lough Atalia Road);
- R339 College Road (Lough Atalia Road to Moneenageisha Junction);
- R338 Dublin Road.

For the Inner-City Access Route:

- Fairgreen Road;
- Bóthar Uí hEithir and R336 Prospect Hill;
- Bóthar na mBan / St. Brendan's Avenue / R866 Headford Road / Dyke Road;
- Woodquay / Walsh's Terrace / Daly's Place / Mary Street; and
- Forthill Street / R336 Merchants Road / Queen Street.

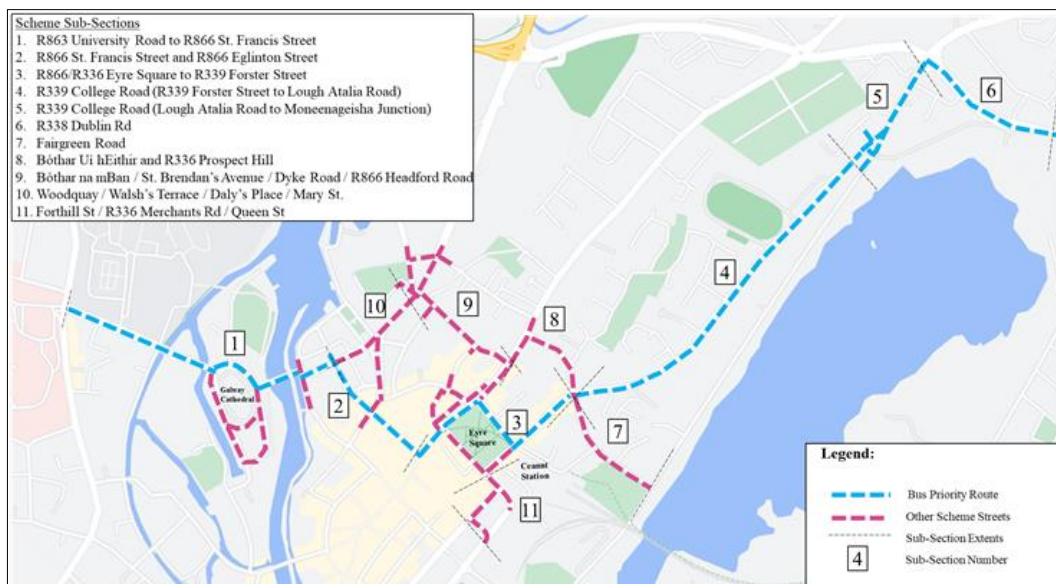


Diagram 3: Sub-sections

6.1 Sub-section 1: R863 University Road to R866 St. Francis Street

The Proposed Scheme involves the creation of bus lanes over the existing Salmon Weir Bridge, effectively closing the Salmon Weir Bridge to general vehicular traffic during the hours of operation of the bus lane (07:00-10:00 and 13:00-19:00, with access permitted during the 10:00-13:00 period to facilitate deliveries/loading. Bus priority will be achieved along University Road largely through the removal of vehicular traffic demand along the route.

The inbound bus lane will begin to the immediate east of the existing vehicular access to Fisheries Field and will terminate immediately to the east of the Salmon Weir Bridge. This will permit vehicles exiting from Newtownsmith to travel along

St. Vincent's Avenue, during times that vehicles are permitted to exit from Newtownsmith.

The outbound bus lane along this route begins at the junction of St. Vincent's Avenue with St. Francis Street. The St. Francis Street approach to this junction does not have a bus lane, meaning any vehicles travelling along St. Francis Street which are not permitted to enter a bus lane must either turn right onto the R866 towards the Headford Road, or continue straight towards Waterside.

On the R866 westbound approach to the St. Francis Street / St. Vincent's Avenue junction, a westbound bus lane is proposed beginning at Woodquay, meaning only vehicles permitted to travel along a bus lane will arrive at this junction and can continue onto the bus lane along St. Vincent's Avenue towards the Salmon Weir Bridge.

The scheme will convert Gaol Road (West) into a two-way street alongside the Cathedral to the west and south, with the Gaol Road (east) junction to University Road being closed off to all public transport and vehicular traffic. This creates a natural 'gateway' whereby general traffic is diverted from University Road in advance of Salmon Weir Bridge, and also facilitates local access to Nun's Island and the environs of Galway Cathedral.

In tandem with these works, the existing car park to the south of Galway Cathedral is also proposed to be amended, to provide additional coach parking facilities and to reduce the number of car parking spaces as a result. The existing vehicular egress arrangement from Galway Cathedral is also proposed to be amended, with the existing entrance on the southern side to be widened into an entrance and exit, with the existing exit on the eastern side to be closed to vehicular traffic.

Traffic calming features are proposed along the route entailing the provision of raised tables (a vertical deflection in the level of the carriageway used to promote lower design speeds and slow turning vehicle at junctions and enable pedestrians to cross the street at grade) at Canal Road Upper and Fisheries Field, and the provision of two new signalised pedestrian crossings on University Road. These will impact upon the existing on-street parking provision with a reduction in parking spaces along University Road.

6.2 Sub-section 2: R866 St. Francis Street and R866 Eglinton Street

The Proposed Scheme involves converting the inbound lane of both St. Francis Street and Eglinton Street into a bus-only lane while maintaining the outbound lanes as all-traffic lanes. The scheme also proposes reversing the one-way direction of traffic on Daly's Place from Woodquay to Eglinton Street.

All traffic from Mary Street, will be required to turn left onto St. Francis Street unless permitted to enter into a bus lane, while all traffic from Daly's Place will be required to turn right unless permitted to enter into a bus lane. Local access to Eglinton Street will remain possible via Eyre Street and Eyre Square, however

Eglinton Street outbound will effectively be removed as a through route, thereby providing bus priority over general traffic.

St. Francis Street inbound and Eglinton Street inbound will operate as bus only during the hours of operation of the bus lane, while St. Francis Street will be open to general traffic to permit local traffic from Woodquay to access St. Francis Street and return to the Headford Road and traffic from Mary Street to access the Headford Road.

6.3 Sub-section 3: R866/R336 Eyre Square to R339 Forster Street

The Proposed Scheme involves converting Forster Street and Eyre Square East into two-way, public transport-only streets during peak hours, with Eyre Square North (already operating as two-way) and Williamsgate Street also becoming public-transport-only (heading eastbound only).

The westbound route along Eyre Square North and Williamsgate Street will not be designated as public transport-only, in order to facilitate the current time-limited loading and delivery access to Shop Street via Williamsgate Street.

As part of the Scheme, Prospect Hill will also become a two-way route, to facilitate loading/delivery and taxi access from the north-east. However, there will be restricted connectivity through to Eyre Square North from Prospect Hill (there will be a looped route which will allow vehicles to enter and exit from the north-eastern approach).

Access for vehicular traffic from Prospect Hill to Eyre Square will be permitted during specific hours to allow for loading and access to the Shop Street Area. Loading/delivery vehicles approaching from the south will use Eyre Square West to access Williamsgate and Shop Street.

Access to Eglinton Street and Eyre Square North Plaza and Rosemary Avenue can be achieved via Eyre Street onto Eyre Square North. This will also be restricted to specific permitted hours to coincide with delivery and casual trading times permitted at Eyre Square.

Between Eyre Square South and St. Patrick's Avenue, no bus lanes are proposed in order to maintain vehicular access to St. Patrick's Avenue which is the sole access to residential properties and parking. However, this is extremely limited and therefore no impact on bus operation is anticipated along this section.

Forster Street is proposed to be converted into a two-way bus only street (07:00-10:00 and 13:00-19:00, with access permitted during the 10:00-13:00 period to facilitate deliveries/loading, etc.). Existing parking will be converted to loading bays and public realm improvement areas. The junction of Forster Street / Bóthar Uí Eithir / Fairgreen Road / College Road will be reconfigured to facilitate altered movements, including the removal of left slip lanes, shorter pedestrian crossings and crossings on all arms of the junction.

The junction of Eyre Square / Forster Street / Ceannt Station and Frenchville Lane will be signalised for all movements, this will include controlled pedestrian crossings on all arms of the junction.

Existing shared loading bays / taxi ranks will be retained along Eyre Square East with the directions being reversed, however the taxi rank and disabled parking along Eyre Square North will be removed with an alternative loading bay on Rosemary Avenue, shared taxi rank / loading bays on Prospect Hill, disabled parking spaces on Prospect Hill and Bóthar Irwin. The existing loading bay on Williamsgate Street will be retained. An eastbound loading bay is proposed at the eastern end of Forster Street at Saint Patrick's Church.

This will in turn lead to on-street parking being removed at this location. One existing bus bay and shelter along Eyre Square North will be removed to facilitate access from Eyre Street.

6.4 Sub-section 4: R339 College Road (R339 Forster Street to Lough Atalia Road)

The proposed scheme will provide a bus gate on College Road in order to restrict through-movement for vehicular traffic, whilst facilitating the movement of public transport vehicles directly to and from Forster Street. This gate will permit local access to and from College Road to be maintained for all vehicles, albeit only from one side or the other depending on the location along College Road. For example, vehicular access to City Hall will be possible for all vehicles, but only from the Lough Atalia / Moneenageisha end of College Road, while vehicle access to The Elms will be possible for all vehicles, but only from the Fairgreen Road / Bóthar Uí Eithir end of College Road.

This proposal will ensure that the only vehicles on College Road will be those with an origin or destination on College Road and will remove this as a through route for general traffic, thereby removing the extensive queuing and delay experienced frequently on this route. Cyclist and bus priority will be achieved through the removal of general traffic.

The proposed bus gate will be a short section of bus lane, controlled by traffic signals and operating on a one-way shuttle system.

6.5 Sub-section 5: R339 College Road (Lough Atalia Road to Moneenageisha Junction)

The Scheme proposes the provision of an outbound bus lane on College Road between Lough Atalia Road and Moneenageisha junction, and an inbound segregated cycle track between Moneenageisha junction and the Lough Atalia Road junction. This will be facilitated through road widening and land acquisition on the western side of the road.

Inbound, a single traffic lane is proposed which will then flare locally to provide right-turning facilities to Loyola Park and College Road. This scheme also includes the provision of inbound, raised adjacent cycle track from Moneenageisha junction to College Road/Lough Atalia Road junction.

Due to the proposed restriction on College Road to through-traffic, at the junction with Lough Atalia Road it is therefore necessary to permit a right-turn manoeuvre from College Road to Lough Atalia to allow traffic exiting College Road at the eastern end to subsequently route back towards the city centre via Lough Atalia Road. It is proposed to realign the junction of College Road and Lough Atalia Road, to a formal T-junction (with College Road forming the minor arm and Lough Atalia Road forming the major arm).

The redesigning of the junction will require localised boundary realignments including the removal of some boundaries and street trees however, the proposals include for provision of additional landscaping and tree planting.

New hard and soft landscaping with outdoor seating will be introduced to enhance the presentation, amenity and biodiversity value of the junction and to create a more pedestrian friendly and distinctive character.

One retaining wall (RW01) is proposed in this sub-section at the frontage of 21-25 Moneenageisha Court and the Bayview House B&B, up to the Moneenageisha Junction. The wall is required to overcome site grading challenges and minimise land acquisition needs.

This section of the Proposed Scheme includes acquisition of residential land on College Road, Enterprise, Light Industry and Commercial lands at Circle K, the Huntsman Inn and recreational and amenity lands at the green area to the front of the Huntsman Inn.

6.6 Sub-section 6: R338 Dublin Road

Dublin Road, between the Moneenageisha junction and the end of the proposed scheme at the entrance to the Brothers of Charity, is to be realigned and widened in order to provide a continuous bus lane in both directions, a segregated cycle track in both directions, a reconstructed footway in both directions and a general traffic lane in both directions.

The inbound general traffic lane flares to two lanes to the immediate west of the Wellpark Retail Park entrance. One of these lanes is a straight ahead lane to Moneenageisha Road while the other is a left turn lane to College Road. The existing right turn lanes on the Dublin Road into the Wellpark Retail Park and to Wellpark Road at the Moneenageisha junction are to be removed.

At the Moneenageisha Junction a bus gate is proposed on the inbound bus lane to provide priority for buses entering the junction.

The outbound bus lane will begin at the Moneenageish junction, fully separate from the general traffic lanes. To provide adequate access, three new bus stops, two outbound and one inbound are proposed, with associated bus shelters.

One minor retaining wall (RW02) is proposed in this sub-section. The wall is required to overcome site grading challenges and minimise land acquisition needs.

6.7 Sub-section 7: Fairgreen Road

The existing two-way vehicle operation of Fairgreen Road is proposed to be retained. As Fairgreen Road intersects with the Cross-City Link at Forster Street and College Road, access onto the Cross City Link will not be required for most traffic. The length of the right turn lane from Fairgreen Road to College Road is proposed to be reduced and the left slip lane from Fairgreen Road onto Forster Street will be removed.

Existing set-down areas in front of Galway Coach Station are proposed to be realigned and retained. The existing taxi rank is also proposed to be retained together with the loading bay on Fairgreen Road.

6.8 Sub-section 8: Bóthar Uí hEithir and R336 Prospect Hill

Due to the creation of a two-way route along the Cross-City Link on Eyre Square East and Forster Street, the current one-way circulatory system around Bóthar Uí Eithir, Forster Street, Eyre Square East and Prospect Hill will no longer be operational. In order to main access along the Inner-City Access Route, Bóthar Uí Eithir and Prospect Hill (between Bothar na mBan and Bohermore) will both become two-way streets for all traffic. On Bóthar Uí Eithir, the existing three lanes width will be maintained. From the entrance to the Forster Court residential development to the junction with Prospect Hill, there will be two traffic lanes travelling towards Prospect Hill and one traffic lane travelling towards Fairgreen Road. From the entrance to Forster Court residential development to the junction with Fairgreen Road, there will be one traffic lane travelling towards Prospect Hill, one traffic lane travelling towards Fairgreen Road and one bus lane travelling towards Fairgreen Road. This bus lane will be a right turn lane towards Forster Street, as this facilitates permitted vehicles to enter onto the Cross-City Link.

The junction of Bóthar Uí Eithir, Prospect Hill and Bohermore will be signalised with controlled pedestrian crossings on all arms of the junction. A left turn and right turn lane are proposed on the Bóthar Uí Eithir approach to the junction while a single lane approach is proposed from Bohermore and Prosect Hill.

6.9 Sub-section 9: Bóthar na mBan/ St. Brendan's Avenue / R866 Headford Road / Dyke Road

Bóthar na mBan, which forms part of the Inner-City Access Route, is proposed to be retained as a two-way street for all vehicles.

At its junction with Prospect Hill, the road will be realigned in order to make the Inner-City Access Route as the priority route. As Bóthar na mBan approaches the Headford Road, the street becomes St. Brendan's Avenue. At its junction with Headford Road, all traffic will be required to continue straight ahead onto Dyke Road or turn left towards Woodquay.

The existing alignment of Bóthar na mBan / St. Brendan's Avenue as it approaches Headford Road, has a 'swan-neck' arrangement as it travels past St. Brendan's Avenue junction, with a sharp right turn followed by a sharp left turn

alignment. Between St. Brendan's Avenue and Headford Road there is a narrow footpath on the eastern side of 1.2m width, which is further restricted due to the presence of utility poles, leaving a passable width of 600m along the footpath. On the western side of the road, there is also an existing 1.2m wide footpath, however, this path is discontinuous, whereby over a distance of approximately 23m, there is no footpath present.

This section of Bóthar na mBan / St. Brendan's Avenue has residential properties directly fronting both sides of the road, with two residential properties on the western side and five residential properties on the eastern side. It is proposed to acquire and demolish two properties, one on St Brendan's Avenue and one on Headford Road to facilitate improvement to the Inner-City Access Route.

The overall cross-section of this portion of Bóthar na mBan / St. Brendan's Avenue is approximately 8.1m.

6.10 Sub-section 10: Woodquay / Walsh's Terrace / Daly's Place / Mary Street

Due to the Cross-City Link on St. Francis Street, St. Vincent's Avenue and over the Salmon Weir bridge, amendments to the adjoining streets are necessary to maintain access and remove through routes. Two-way traffic will be permitted along the R866 (Headford Road / Walsh's Terrace) between the Bothar na mBan junction and the Corrib Terrace junction. At this location a bus lane will be installed on St. Vincent's Avenue from Corrib Terrace to the St. Francis Street junction to join the Cross City Link. Inbound traffic on the R866 can access Corrib Terrace, Waterside and Woodquay. Woodquay will be altered to a one-way traffic route southbound, with an adjoining contra-flow cycle track. At the Daly's Place junction vehicles, can turn left onto Eyre Street and onto Bóthar Irwin or turn right onto Daly's Place and onto St. Francis Street, maintaining access but removing through routes.

44 existing parking spaces at Woodquay are proposed to be removed and replaced with a public plaza incorporating urban landscaping. 22 on-street parking spaces are proposed to be retained to facilitate local requirements.

6.11 Sub-section 11: Forthill Street / R336 Merchant Road / Queen Street

Merchants Road, Forthill Street and Dock Road form part of the City Centre Access Network (CCAN). With the creation of the Cross-City Link, through traffic will no longer be permitted via Eyre Square from Merchants Road.

Local access will remain for vehicles to access St. Patrick's Avenue, Frenchville Lane, Ceannt Station, Queen Street etc. All non-local access traffic will be required to utilise the City Centre access network. There are currently two-lanes on Merchants Road. It is proposed that both of these lanes continue onto Forthill Street and onto Dock Road as part of the CCAN. At the junction of Merchants Road with Forthill Street, the primary route for vehicles will be amended so that both lanes continue onto Forthill Street, with Merchants Road towards Eyre

Square becoming the minor arm of the junction. Similarly, at the Junction of Forthill Street with Dock Road, both vehicle lanes from Forthill Street will continue onto Dock Road, with Queen Street being the minor arm of this junction. These will tie-into the recently constructed footpaths and road fronting the Bonham Quay development.

Existing on-street parking along Forthill Street is proposed to be converted from perpendicular parking to parallel. A new bus stop and associated shelter is proposed on Merchants Road, between Forthill Street and Victoria Place, with loading and taxi ranks retained.

7 Construction

7.1 Introduction

The Construction Phase for the Proposed Scheme is anticipated to take approximately 18 to 20 months to complete. It will be constructed in sections (not necessarily corresponding to the eleven route sub-sections described in 6.1 – 6.11) that will individually have shorter durations typically ranging from one month to thirteen months.

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

- Site preparation and clearance works, including:
 - Land acquisition where temporary or permanent land take is required;
 - Installation of fencing and signage;
 - Protection of trees and vegetation to be retained;
 - Vegetation clearance and treatment of non-native invasive plant species (if needed);
 - Archaeological investigations;
 - Ground investigations;
 - Set up of Construction Compounds;
 - Installation of temporary lighting; and
 - Demolition of items such as buildings, 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;
 - Adjustment or upgrades to drainage;
 - Realignment, upgrades, replacement or protection of utilities and services;
 - Construction of structures, including:
 - Moneenageisha Court retaining wall
 - Dublin Road 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 to accommodate the construction of the Proposed Scheme will be located as follows (refer to Diagram 4):

- Construction Compound 1: Galway Harbour Enterprise Park;
- Construction Compound 2: Galway Harbour Enterprise Park; and

- Construction Compound 3 (satellite): Galway Cathedral.

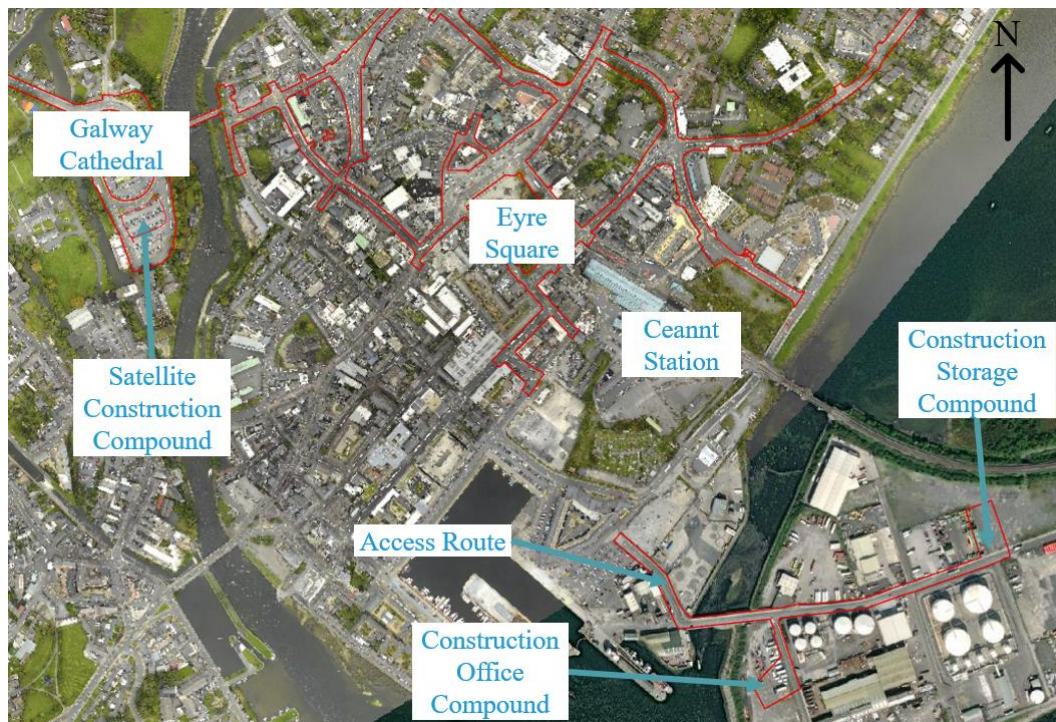


Diagram 4: Proposed Construction and Satellite Construction Compound locations

Construction Compounds will be used as the primary location for the storage of materials, plant and equipment, site offices, worker welfare facilities and limited car parking. The Construction Compounds will be secured, to ensure the safe storage of all on-site material and machinery. Permanent and temporary fencing will be erected, and site security will be employed.

7.2 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, noise and vibration, air quality, resource and waste management, invasive species management, surface water management and environmental incident response measures.

The CEMP will be updated by the GCC (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 GCC 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).

7.3 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 be 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 no longer than thirteen months. GCC will facilitate pro-active communication of the scheduled planned works by the appointed contractor to ensure that impacted individuals, businesses and communities are kept aware of upcoming likely temporary disruptions.

8 Environmental Impacts and Mitigation

The EIA process provides a valuable opportunity to reduce potential environmental impacts through design refinement, and this has formed an integral part of the design process for the Proposed Scheme, whilst ensuring the objectives of the Proposed Scheme are maintained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development programme have been incorporated where appropriate.

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

As outlined in Section 7.1, the GCC (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 GCC 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 networks and the traffic modelling.

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

- The qualitative assessments are as follows:
 - Pedestrian Infrastructure: The changes to the quality of the pedestrian infrastructure as a result of the Proposed Scheme;
 - Cycling Infrastructure: The changes to the quality of the cycling infrastructure as a result of the Proposed Scheme;
 - Bus Infrastructure: The changes to the quality of the bus infrastructure as a result of the Proposed Scheme; and
 - Parking / Loading: The changes to the availability of parking and loading spaces as a result of the Proposed Scheme.
- The quantitative assessments are as follows:
 - People Movement: An assessment has been carried out to determine the potential impact that the Proposed Scheme will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the Proposed Scheme during the Operational phase only;
 - Bus Performance Indicators: The changes to the projected journey times and reliability for buses as a result of the Proposed Scheme; and
 - General Traffic: The direct and indirect impacts on general traffic using the Proposed Scheme and surrounding road network.

For the Construction Phase, temporary traffic management arrangements will be prepared in accordance with Department of Transport's '*Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks*'. Measures to minimise the impacts associated with the Construction Phase will be implemented. A Construction Stage Mobility Management Plan, as described in the CEMP, will be prepared by the appointed contractor to encourage its personnel to travel to site by sustainable modes. The assessment 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 described, the impact on traffic and transport will not be significant.

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

- **Pedestrian Infrastructure:** Overall, the improvements to the quality of the pedestrian infrastructure will have a positive, significant and long-term effect across the Proposed Scheme.

- **Cycling Infrastructure:** The potential improvements to the quality of the cycling infrastructure will have a positive, significant and long-term effect across the Proposed Scheme overall.
- **Bus Infrastructure:** The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will potentially have a positive, slight to moderate and long-term effect overall.
- **Parking and Loading:** The results of the assessment demonstrate that the changes to the parking and loading provision will result in an overall loss of 258 spaces. Given the nature of the loss in parking and the availability of alternative spaces in the indirect study area, the impact is expected to be negative, slight and long-term overall.
- **People Movement:** Overall, it is anticipated that the increases to the total number of people travelling along the Proposed Scheme by sustainable modes will have a positive, very significant and long-term effect.
- **Bus Network Performance Indicators:** Overall it is anticipated that the improvements to the network performance indicators for bus users along the Proposed Scheme will have a positive, very significant and long-term effect.
- **General Traffic Network Performance Indicators:** Overall, it has been determined that the impact of the reduction in general traffic flows along the Proposed Scheme will be a positive, slight and long-term effect whilst the impact of the redistributed general traffic along the surrounding road network will have a negligible and long-term effect.

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 a modal shift to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the movement of people as population and employment levels grow in the future. The scheme design has been developed with cognisance of the relevant accessibility guidance and universal design principles so as to provide access for all users.

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

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 considers the likely significant effects associated with the construction and operation of the Proposed Scheme on air quality. The assessment focusses on the main sources of pollutants likely to be associated with a development such as this. Possible pollutants include dust emissions which might arise during construction as well as traffic related pollutants, such as nitrogen oxides and particulate matter.

Given that there are a number of sensitive receptors located relatively close to the proposed works, there is potential for air quality effects arising from dust during construction activities, arising from activities such as earthworks and construction activities. A qualitative assessment was undertaken, and the dust risk prior to the implementation of mitigation measures is found to be medium for demolition and construction activities, high for earthworks and low for track-out, according to the Institute of Air Quality Management Guidance.

The contractor will be required to implement standard mitigation measures during construction to minimise air quality effects, such as erecting hoarding around Construction Compounds, keeping site areas clean, revegetating earthworks and exposed areas as soon as practicable, ensuring vehicles entering/leaving site are covered and that appropriate wheel-wash systems are provided and controlling dust generation through appropriate dust control measures. Dust monitoring will be undertaken at the three nearest sensitive receptors (with agreement from the landowner) to the works during the construction phase.

A Construction Environmental Management Plan has been prepared and details the dust mitigation measures to be implemented, such that dust effects will be minimised.

The redistribution of traffic during the operational phase of the Proposed Scheme has the potential to generate air quality impacts at some roadside sensitive receptors. In general, air quality improvements will be experienced directly on the Proposed Scheme, with potential improvements along adjacent roads. The potential impacts have been assessed with an air dispersion model.

The existing baseline scenario (using the 2019 traffic modelling outputs) was modelled for NO₂ (nitrogen dioxide), PM₁₀ (particulate matter greater than 10 microns) and PM_{2.5} (particulate matter greater than 2.5 microns). The particulate matter concentrations were found to be below the relevant national air quality limit value objectives for the baseline scenario for all modelled receptors. Therefore, the particulate matter was screened out of further assessment as there is no likelihood of exceeding limit values, in line with Air Quality guidance.

The modelling assessment of NO₂ was undertaken for the Opening Year (2023) which includes worst-case fleet assumptions relative to the Design Year (2038).

The modelling indicates that the Do-Something scenario (with the Proposed Scheme) results in annual mean concentrations of NO₂ which are below the relevant national air quality limit value objectives at all modelled receptors, which is no change from the Do-Minimum scenario (without the Proposed Scheme).

The majority of modelled receptors are estimated to experience a negligible impact due to the Proposed Scheme in terms of the annual mean NO₂ concentration, with a small number of sensitive receptors experiencing a slight negative impact, and a small number of sensitive receptors experiencing slight positive impact. This results in an overall neutral, long-term impact to air quality.

An assessment of the nearby ecologically designated sites (within 2km) has been assessed, namely Galway Bay Complex SAC and pNHA (Site Code 000268), Lough Corrib SAC (Site Code 000297) and Inner Galway Bay SPA (Site Code 004031). The assessment found that the predicted maximum deposition of nitrogen (including background) is in compliance with the worst-case critical load at the worst-case ecological receptor (as per the TII Guideline Critical Loads for Nitrogen for oligotrophic waters of 5-10 KgN/ha/yr). There will therefore be no impact on ecologically sensitive sites. In accordance with the Environmental Protection Agency (EPA) Guidelines (EPA 2022) the ecological impacts associated with the operational phase traffic emissions are overall neutral and long-term.

No significant residual effects are predicted on air quality during the construction of the Proposed Scheme having regard to the effectiveness of the mitigation measures proposed.

As there are no significant adverse effects on air quality predicted during the operational phase of the Proposed Scheme, no mitigation or monitoring measures are proposed.

8.3 Climate

The climate assessment considers the likely significant effects associated with the construction and operation of the Proposed Scheme on climate.

The Institute of Environmental Management and Assessment stipulates that while all carbon emissions contribute to climate change, the significance ratings should not solely be based on whether a project emits Greenhouse Gas (GHG) emissions alone, but how the project makes a relative contribution towards achieving a science-based 1.5°C aligned transition towards net zero. Therefore, potential effects of emissions of carbon due to the construction and operation of the Proposed Scheme are considered in the context of Ireland's national climate change obligations. In the absence of sectoral carbon budgets, the EPA projected emissions baselines for future years (with additional measures) are used for contextualising the predicted GHG emissions. The assessment considers impacts as being either neutral or positively / negatively significant with neutral defined as a change in GHG emissions which is less than $\pm 0.5\%$ of the baseline emission level.

The assessment of carbon emissions was carried out to determine the likely greenhouse gas emissions (CO₂ equivalent) predicted due to the construction phase of the Proposed Scheme, relative to Ireland's projected baseline for 2024 (the predicted worst-case construction year), as reported by the Environmental Protection Agency. This assessment focuses on the embodied carbon of the material used during the construction phase.

The carbon emissions associated with the construction of the Proposed Scheme is estimated to be 0.0003% of the projected total emissions (with additional measures) in 2024. The mitigation measures proposed are inherent to the construction design, including the use of recycled and low carbon construction materials, which will have the effect of reducing carbon emissions during the construction phase. On this basis, the predicted impact to climate due to embodied carbon emissions during the construction phase will be negligible and long-term.

The operational phase assessment gives a comparison between the Do Something (with the Proposed Scheme) and Do Minimum (without the Proposed Scheme) GHG emissions for the Opening Year (2023) and the Design Year (2038). For the Opening Year the assessment predicts an increase 1,300 tonnes in CO_{2eq}. This is equivalent to a 0.39% increase in CO_{2eq} relative to the Opening Year Do Minimum estimates. This is equivalent to 0.01% of the projected transport sector emissions in 2023 as projected by the Environmental Protection Agency (with additional measures). For the Design Year the assessment predicts an overall increase of 6,700 tonnes in CO_{2eq}. This is equivalent to a 0.33% increase in CO_{2eq} relative to the Design Year Do Minimum estimates. This is equivalent to 0.09% of the projected transport sector emissions in 2038. There will be a marginal increase in GHG emissions associated with the Proposed Scheme, which is attributable to the redistribution of traffic resulting in longer travel distances in both 2023 and 2038. Thus, the predicted impact to climate during the operational phase of the Proposed Scheme is predicted to be neutral and long-term as the change is less than 0.5%. There is the potential for the predicted emission to be lower with potential for an increased modal shift, further decreasing car usage and thus the associated emissions.

Furthermore, the infrastructural works proposed as part of the Proposed Scheme will support the delivery of government strategies outlined in the Climate Action Plan (CAP) 2021 and the Climate Action and Low Carbon Development (Amendment) Act 2021, by enabling sustainable mobility and delivering a sustainable transport system. Its aim is to provide enhanced walking, cycling and bus infrastructure on key access routes in Galway City. This will subsequently enable and deliver integrated sustainable transport movement in the city.

The operational impacts associated with vulnerability to climate change is considered to be not significant with the implementation of the inherent mitigation measures to reduce the effects of flooding and increase in permeable areas. In addition, the increase in permeable areas and planting as part of the Proposed Scheme is predicted to result in a slight, positive, long-term impact on carbon sequestration as a result of the operation of the Proposed Scheme.

Following the implementation of mitigation measures, no significant residual negative effects on climate are predicted during the construction and operational phases.

8.4 Noise & Vibration

The noise and vibration assessment involved baseline noise monitoring to establish current background noise levels, and a detailed noise and vibration impact assessment associated with the construction and operational phases.

The baseline noise surveys determined that currently the main source of noise in the study area is road traffic noise, with contributions from local urban and suburban sources such as pedestrian movements and commercial activities. There are no notable sources of vibration in the study area. 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 noise is very similar to the operational phase noise and is dealt with in a similar way.

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

Following the application of these mitigation measures, noise impacts associated with the construction phase are predicted to be of negative, not significant to slight and temporary, with the exception of general road works, urban landscaping, road widening, and utility diversion works. These works are predicted to have a negative, moderate to significant, temporary impact on receptors within 10 m of the works. Construction works are, by their nature, temporary and non-stationary. Some receptors will experience increased levels of noise or vibration for a prolonged period of time.

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

During the opening year, 2023, increased traffic noise levels will occur along a small number of roads associated with the Proposed Scheme as a result of traffic redistribution. During this initial short to medium term phase, residual indirect impacts are calculated as negative, significant, short to medium term along Presentation Road, Lough Atalia Road, and Cross Street Lower; negative, moderate to significant, and short to medium term along Mill Street, and University Road; negative, moderate, and short to medium term along Corrib Park and Woodquay Street; and negative, slight to moderate, and short to medium term along Moyola Park.

No significant adverse impact is predicted for the remaining roads in the study area for the short to medium term, with the overall impact being positive.

During the design year, 2038, increased traffic noise levels will occur along a small number of roads associated with the Proposed Scheme as a result of traffic redistribution. During the long-term phase, residual indirect impacts are calculated as negative, significant, and long term along Lough Atalia Road, and negative, moderate to significant, and long term along Riverside. No significant adverse impact is predicted for the remaining roads in the study area for the long term, with the overall impact of the Proposed Scheme being positive.

8.5 Population

This assessment focused on demography and employment, economic activity, housing and land-use, community facilities, traffic and public transport. Additionally, the assessment considered the impacts on population from noise & vibration, air quality and landscape (visual impact).

It is considered that the proposal will largely have limited negative impacts during the construction phase of the development which is, by its nature, temporary. The employment of up to 100 staff will provide a temporary positive economic impact to the economy in terms of associated spending from construction works. The removal of 59 early mature and mature trees during construction works will result in a significant permanent impact associated with the project. However, this will be mitigated by the planting of 186 new street trees as part of the Proposed Scheme. Some residential, community and commercial receptors will experience negative impacts during the construction phase as a result of land take. However, access to these receptors will be maintained, as far as reasonably practicable during the construction phase. Although, it is noted that the Circle K site on College Road will be impacted negatively during the construction phase due to the fact that the business will be required to be shutdown for a period of time.

In contrast, the operation of the development will provide many significant positive impacts to the city and wider area, including:

- Positive noise & vibration impacts as a result of reduced traffic volumes.
- Positive effects on modal share due to an increase in people movement by sustainable modes.
- Improved access to community facilities along the Proposed Scheme.
- Positive visual effects as result of public realm improvements.
- Positive impacts on commercial businesses due to the increase in passing trade.

Although, it is noted that the Circle K site on College Road will be impacted negatively during the operation phase due to decreased accessibility for private vehicles, potentially diminishing the viability of the site as a filling station. There will also be a significant long-term negative impact on the at 5/6 Headford Road and 20 Brendan's Avenue predicted, based on the proposed permanent acquisition and demolition of these properties to allow for a widened street width and changes to areas of landscape and hard surfacing.

No additional mitigation measures are proposed for the population assessment. The improved connection provided across the City will have a positive impact on the potential for economic development and continued growth in tourism numbers.

8.6 Human Health

Active forms of travel, such as walking and cycling, are associated with a range of health benefits. Provision of improved cycling and walking infrastructure encourages increases in these types of physical activity and improves safety levels. Reliable and efficient public transport improves the accessibility of services and facilities including healthcare and education. The assessment of effects on human health is largely based on the assessments of the effects on those factors under which human health effects might occur. These are mainly Noise & Vibration, Air Quality, Traffic & Transport and Landscape.

The Proposed Scheme will generally have positive effects on transport. The Proposed Scheme is likely to have very significant positive long-term effects on numbers of people using sustainable transport and on bus journey times. It is also likely to have significant positive long-term effects on levels of physical activity due to improved opportunities and convenience for walking and cycling, combined with increased safety and perception of safety.

Landscaping associated with the Proposed Scheme, including a net increase in tree numbers, is likely to have significant positive long-term effects on the urban townscape.

Some slight to moderate adverse traffic effects at junctions and some adverse impacts on noise are likely to occur at a small number of locations, as discussed in the Traffic and Noise chapters of this EIAR.

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 and birds.

The Proposed Scheme would be constructed in the existing urban areas of Galway City which is predominantly comprised of the existing buildings and hardstanding areas 'Buildings and artificial surfaces' which comprise the roads, paths, cycle lanes, laybys, parking areas and artificial surfaces of the City.

In general, there are few natural habitats in the majority of the Proposed Scheme area. They have either been modified or are artificial in nature in an urban context. The main natural habitats of conservation concern are the River Corrib and Lough Atalia. There were no rare or protected flora recorded in the Project area.

The Project boundary overlaps the boundary of the Galway Bay Complex SAC and is adjacent to but outside the boundary of the Inner Galway Bay SPA at Lough Atalia opposite the G Hotel.

The junction of College Road/Lough Atalia Road is to be realigned and a new drainage pipe and non-return valve to be installed at discharge point into Lough Atalia. The ecological boundary of this SAC may be considered to be co-aligned with the Inner Galway Bay SPA boundary in this area which in coastal areas corresponds to the Mean High Water Mark.

Lough Atalia is included in the Galway Bay Complex SAC as a Coastal Lagoon. Coastal lagoons are priority habitats under the Habitats Directive.

The main habitats within the Proposed Scheme include Buildings and artificial surfaces, Amenity grassland, Mixed broadleaved woodland, Flower beds and borders and water features, in particular the River Corrib and the Coastal Lagoon which is Lough Atalia.

The assessment identified:

- No protected plant species along the Proposed Scheme.
- There are two known records of Japanese Knotweed currently undergoing treatment by GCC in close proximity to the Proposed Scheme. A record at Beggars Bridge, University Road appears to have been successfully treated and a record at Lough Atalia Playground, successfully treated. There is one record of Japanese Knotweed located to the east of a proposed site compound at Galway Harbour Enterprise Park.
- Potential roost features (locations where bats rest) at two locations within the Proposed Scheme;
- All trees within the project boundary were assessed for bat roost potential – there were no trees of the appropriate size and with sufficient gaps, cracks, crevices or holes to be used by bats;
- No evidence of badger;
- Several otter records were made during multidisciplinary surveys;
- Several breeding bird species including the wintering Annex I birds, at Lough Atalia;
- Good quality habitat for fisheries — and desk studies and consultation confirmed Atlantic salmon and Brown trout populations along the River Corrib system and the presence of Sea Lamprey;
- Harbour seal are regularly seen in the estuarine waters downstream of Wolf Tone Bridge.

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

- Site preparation and clearance;
- Removal of existing boundaries, pavements, lighting columns, bus stops, and signage;
- Protection and / or diversion of buried services;

- Reconnection of existing and new drainage infrastructure into the existing surface water drainage infrastructure;
- Road widening, pavement reconstruction, and kerb improvements;
- Temporary and permanent land take;
- Installation of new bus stops and junction;
- Property boundary reinstatement, signage replacement; installation of lighting columns; and
- Landscaping and tree planting.

Construction management measures are presented in project CEMP and in the project Natura Impact Statement (NIS). The measures will accord with the principles set out in industry guidelines including CIRIA's report 'C532: Control of water pollution from construction sites'.

There are no predicted cumulative effects given that it is predicted that the Proposed Scheme will have no significant effects on biodiversity. In this way, in-combination impacts with Plans or Projects for the development area and surrounding area in which the development site is located, would be avoided.

Given the inclusion of best practice construction management measures to be employed as per a site specific CEMP with regard to the protection of water courses and maintenance of good water quality for Salmonids, Lamprey, Otters and Seals, there will be no residual effects after the construction phase is completed.

Given, the inclusion of appropriate design of lighting for the avoidance of potential impacts on feeding and commuting bats, there will be no residual effects once the project becomes operational.

The Proposed Scheme will incorporate SuDS features in accordance with the Development Plan requirements to reduce the quantity of surface water discharging into the receiving system particularly at Lough Atalia. This is predicted to be a positive long term residual effect.

8.8 Water

This section assessed the potential impact of the Proposed Scheme on the surface water environment during the Construction and Operational Phases. The hydrology, hydromorphology and water quality attributes of each surface waterbody are considered. The assessment was carried out according to best practice and guidelines relating to surface water assessment and has taken account of experiences in assessing similar large-scale infrastructural projects.

The study area of the project was set to extend to approximately 250m beyond the footprint of the proposed Scheme. This was considered appropriate because the Guideline on Procedure for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII, 2009) recommends that the study area should encompass an overall width of 500m, i.e., 250m from the centre line of the route corridor.

Therefore, all identified surface waterbodies within that area were considered as receptors including those classified under Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

The existing system within the Study Area is serviced by surface water and combined drainage network. Flows are typically collected in standard gully grates and routed via a gravity network to outfall points. The main surface water receptors within the study area include River Corrib, Distillery River, Friar's River, and Lough Atalia. Both Distillery River and Friar's River are parts of the Corrib River system. The Corrib River has a Q4 (Good) status. Lough Atalia and River Corrib are parts of the wider Lough Corrib SAC.

The construction phase of the Proposed Scheme will involve widening of footpaths, and/or resurfacing of carriageway, and excavation of trenches for road crossing. The principal impact of these activities was identified to be generation of silt/sediment during construction. The risk of accidental spillage of oils and fuel at Construction Compounds and work sites was also assessed. Application of good practice measures are considered adequate to avoid any significant impact on the surface water receptors and hence the predicted construction phase impact was deemed imperceptible.

Overall, the permeable area has increased by approximately 1,700m² or 1.6% due to the Proposed Scheme. However, there are isolated locations where the impermeable area has increased. The increase in the impermeable surface area is minimal and therefore there will be no significant increase in the runoff discharge to receiving watercourse during operation. To improve the existing condition, the proposal includes runoff management systems that limit the discharge rate to pre-existing condition, and no impact is anticipated on channel morphology and flooding. The predicted impact magnitude during operation is therefore imperceptible.

Taking into consideration the anticipated impacts of the Proposed Scheme on the biological, physico-chemical and hydromorphological quality elements, the Proposed Scheme will not compromise progress towards achieving "Good" Status or cause a deterioration of the overall good ecological potential of any of the water bodies that are in scope under the Water Framework Directive (WFD).

The in-combination impacts on hydrology of the Proposed Scheme and other potential development are considered imperceptible.

A standalone Flood Risk Assessment (FRA) was prepared for the Study Area in accordance with the Department of the Environment, Heritage and Local Government (DEHLG)/ Office of the Public Work (OPW) guidelines. Whilst most areas are at low risk of flooding (i.e., Flood Zone C), sections of the Proposed Scheme are either in Flood Zone A or B. With the type of development being "essential infrastructure" (i.e., highly vulnerable), a justification test was completed and determined that the proposal satisfied all the test criteria.

It is not anticipated that any of the activities of the Scheme will result in a specific risk that requires flood mitigation measures, other than those embedded in the design as good practice. Over and above these, it is proposed that the following are implemented during construction:

- Choose appropriate timing (flooding or high flows) for the works to reduce the risk of contaminated surface water discharging into surface water receptors during storm events,
- Sampling and monitoring of storm water discharges at construction sites. The exact locations and frequency as determined by the Environmental Clerk of Works (ECoW).

No further mitigation measures are proposed for the Operational Phase.

8.9 Land, Soils, Geology & Hydrogeology

An assessment of the potential impacts associated with the construction and operational phases of the Proposed Scheme on Land, Soils, Geology and Hydrogeology has been carried out. The assessment is based on a desk study, field measurements and a review of a ground investigation.

The study area for this land and soils assessment extends 0.25km from the Proposed Scheme boundary. A baseline environment was established from publicly available information, site walkovers and a site investigation.

The soils and subsoils in the study area mainly consist of made ground which refers to soil which has been either been altered or placed by man. The made ground is underlain by glacial material comprising clay and stone (called till). Gravel deposits have been identified in the east of the study area underlying the till. Fine sediments deposited by rivers have also been identified close to the River Corrib in the west and similar deposits formed on the edges of the Lough Atalia Estuary have been identified adjacent to Lough Atalia including peat.

Two bedrock aquifer types underlie the proposed development. A poor bedrock aquifer underlies the west of the proposed development and a regionally important bedrock aquifer containing features formed by dissolving the rock (karst) underlies the centre and east of the development.

In addition to the above the following sensitive features have been highlighted in the Study Area: St. Augustine's Well, a karst spring and geological heritage feature, a well feeding a Group Water Scheme and two Special Areas of Conservation (Galway Bay Complex and the River Corrib).

A number of potential sources of contamination were identified throughout the study area, this included the College Road Service Station (CRSS) which is located inside the boundary in the east of the Proposed Scheme. A detailed investigation found no significant soil contamination from the current use, but elevated levels of the heavy metal cadmium were found in groundwater under and in the vicinity of CRSS and in the water flowing into Lough Atalia. The Proposed Scheme will remove the source of this contamination within the boundary of the project. This will have a beneficial impact on the groundwater quality and Lough Atalia.

There are a number of activities associated with the construction and operation of the development which may have negative impact on the sensitive features in the Study Area. These relate to the excavation of potentially contaminated soils including under CRSS, the potential accidental release of pollutants to groundwater or surface water caused by construction activities and dewatering of the regionally important bedrock aquifer during construction.

Mitigation measures are proposed which include standard construction practices. Implementation of these mitigation measures will remove or reduce the impacts of these effects so that they will be imperceptible. No residual effects of significance on land and soils have been identified.

8.10 Archaeological Cultural Heritage & Architectural Heritage

The Proposed Scheme includes the creation of a public transport corridor linking the western and eastern suburbs of Galway City, through the city centre core and the facilitation of improved pedestrian, cyclist and bus accessibility and movement. This will engender infrastructural works at certain roads and junctions and improvements to the public realm at a number of locations within the city centre, including Eyre Square (north), Woodquay and in the vicinity of Galway Cathedral. The upgrade or replacement of underground services and structures will also be required at certain locations.

The majority of the scheme lies within existing carriageways, although some pedestrianised areas and small sections of greenspace are included, chiefly to the north side of Eyre Square and northeast of Galway Cathedral.

The archaeological, architectural and cultural heritage assessment examines the area within 50m of the Proposed Scheme and establishes what effect the works may have on sites and areas of archaeological and cultural heritage potential within that study area. The 50m study area is appropriate as it reflects the very urban nature of the landscape surrounding the Proposed Scheme.

The assessment identified 18 individual and groups of recorded archaeological monuments within this study area, although one of these is a redundant record (Archaeological Heritage (AH17)). One of these records, AH13, covers the historic town defences of Galway, a National Monument, which the Proposed Scheme crosses along Eglinton Street and towards the north-eastern end of Williamsgate Street. A large portion of the Proposed Scheme is also situated within the zone of archaeological potential for the historic town of Galway (AH 1). Of the 17 archaeological sites and groups of sites, two are listed on both the Record of Protected Structure (RPS) and National Inventory of Architectural Heritage (NIAH) Survey and a further three are included on the RPS.

There are 87 protected structures and groups of protected structures (as listed within the city development plan) in and within the Proposed Scheme and its 50m study area.

These include the rivers and waterways of Galway, with bridges, walling, embankments, piers and other associated infrastructure (Built Heritage (BH1)), Galway Cathedral (BH5), remains of the town defences (BH75, BH77, BH83) and numerous residential and commercial buildings, several of which incorporate medieval remains. Of these, three are also part of a National Monument (Town Defences), three are also listed on both the RMP and the NIAH Survey and two are listed both as an SMR and on the NIAH Survey. A further three are also listed on the Record of Monuments and Places (RMP) only and 41 are also included on the NIAH Survey only. In addition to the 46 NIAH records that are also protected structures, a further 14 NIAH records were identified that do not appear on the RPS, for a total of 60 NIAH records. Of these, five are also recorded as RMP/SMR sites.

The assessment also identified 11 cultural heritage sites, i.e. sites which are not listed on surveys such as the RMP/SMR, RPS, NIAH, but are still deemed to have cultural and/or historical value. Many of these are items of historic street furniture, though arguably the most significant is the JFK Memorial Park of Eyre Square (CH10).

Overall, the majority of the Proposed Scheme will be relatively low to moderate impact in terms of the archaeological, architectural and cultural heritage resource and this is due to the primary fact that the majority of works will be within existing carriageways associated works being carried out in areas that have already been disturbed or subject to development. There is, however, always the potential for previously unknown features of archaeological significance to survive beneath ground level and a number of previous archaeological excavations within the Proposed Scheme and its immediate vicinity have demonstrated the survival of post-medieval and medieval remains below street level, including those of the town defences National Monument. There is also a potential for indirect impacts upon sites through longer term alterations to their settings which may come about as a result of works associated with the Proposed Scheme. As a result of these factors, a number of predicted direct and indirect negative impacts upon the archaeological, architectural and cultural heritage resource were identified by the assessment, ranging in significance from imperceptible to very significant.

At the construction phase (direct impacts) six very significant negative impacts are predicted, one on the archaeological resource and five on the architectural; the National Monument comprising the town defences (AH13/BH75) is included amongst these. Ten significant negative impacts, three archaeological, two architectural and five cultural are also predicted. The remaining predicted impacts at the construction phase comprise two of moderate negative significance on the archaeological resource and four of slight negative significance on the architectural resource. There is also the potential at the construction phase for significant negative impacts upon the City Core and Eyre Square Architectural Conservation Areas.

At the operational phase (indirect impacts) one significant negative impact and four moderate negative impacts are predicted on the architectural resource. The remaining impacts at this phase are slight (12 on the architectural and two on the cultural heritage resources) or imperceptible (two architectural).

There is also the potential at the operational phase for moderate impacts upon the City Core and Eyre Square Architectural Conservation Areas.

A suite of mitigation measures will be carried out prior to the commencement of construction, as well as during groundworks. Mitigation measures will include written and photographic records, protection in-situ and archaeological monitoring. All mitigation will require the approval of the National Monuments Service of the DoH/LGH and local authority. Works on and in the vicinity of the National Monument (town defences) will require Ministerial Consent.

Whilst individual direct and indirect negative impacts have been identified it should be noted that following the completion of mitigation measures there will be no significant negative residual Construction or Operation Phase impacts upon the archaeological, architectural or cultural heritage resource. As a whole historic landscape, the reduction of traffic within the city centre as a result of the Proposed Scheme going ahead, has the potential to result in a slight to moderate positive residual impact in relation to the setting and conservation of the archaeological, architectural and cultural heritage resource.

8.11 Landscape (Townscape) & Visual

This assessment considered the potential landscape (townscape) and visual impacts of the Proposed Scheme. This assessment involved desk-based review of available information including aerial photography and mapping of the Proposed Scheme. Route walkovers were carried out to verify desk-based findings and this included field surveys of specific areas and the capturing of photomontages (as included in this EIAR).

The majority of the works associated with the Proposed Scheme will include improvements to the existing roadway, pedestrian facilities and public spaces.

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

The city centre core is urban in nature with 2-5 storey buildings with retail, commercial, institutional and residential uses. The River Corrib, Canals and open spaces (Eyre Square, Millennium Park, Wood Quay, Lough Atalia) are important and sensitive landscape features. Outside of the city centre, the areas surrounding the route are more residential in character with 2-3 storey buildings. There are important institutional, and community uses along University Road including NUIG and Galway Cathedral.

Currently, Galway City Centre is negatively influenced by busy vehicular traffic, with congestion affecting the character of the urban environment, impacting on quality of life of residents and the safety of all roads.

In places, there is an overdominance of vehicular traffic and parking, with narrow footpaths for pedestrians and limited space for cyclists.

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

- Removal of 59 no. trees within the Proposed Scheme area (in car park south of Galway Cathedral, Prospect Hill, College Road, Moneenageisha Court and Dublin Road) giving rise to localised negative, significant and long-term effects.
- The construction works will involve substantial changes and activity which will detract from sections of streetscape character as construction progresses along the route of the Proposed Scheme impacting residential and commercial properties, amenities and streets. These construction phase effects will be negative, significant and short-term.

Mitigation measures are proposed to avoid or reduce negative landscape (townscape) and visual impacts during the Construction Phase.

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

- Changes in the physical and visual character of the existing road / street;
- Changes in traffic, pedestrian and cycle movements;
- Changes to private property / boundaries; and
- Adjustments to other areas / boundaries.

A series of photomontages along the route illustrate the existing and proposed views of the Proposed Scheme.

The widening of pedestrian footpaths, creation of new pedestrian crossings, urban spaces, reduction in vehicular traffic and new tree planting will bring positive benefits to the character of the city. The proposed design and treatment of the public realm has been guided by the Galway Public Realm Strategy.

As part of the proposed public realm scheme 186 new street trees will be planted, which has the potential to give rise to positive and long-term effects.

The provision of an enhanced pedestrian and cycle environment has the potential to have a significant, positive, and permanent effect on the townscape character providing better, universally accessible connectivity into and through the city centre.

With the implementation of the proposed mitigation measures, it is expected that there will be no remaining significant impacts on landscape (townscape) and visual.

8.12 Waste & Resources

This assessment considered the potential impacts of the Proposed Scheme on waste and resources. This 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.

In Ireland, the most recently available published data records 8.8 million tonnes of Construction and Demolition (C&D) waste was generated, an increase of 2.6 million tonnes from 2018 (EPA 2021). Of this waste, 7.5 million tonnes comprised soil and stones, making up 85% of the material waste stream.

In Ireland, municipal waste (i.e. typical household waste types) is made up of household waste as well as commercial and other waste that, because of its type, is similar to household waste.

According to the Environmental Protection Agency, Ireland generated 3.1 million tonnes of municipal waste and recycled 38% of this waste in 2019.

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

- Construction and reconstitution of cycleways, footpaths, road widening and urban realm improvements;
- Removal of trees, concrete kerbs, boundary walls and fences;
- Removal of small retaining walls;
- 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.

Mitigation measures are proposed to avoid or reduce negative impacts on waste and resources during the Construction Phase.

Approximately 700 tonnes of demolition waste will be generated as a result of the Proposed Scheme which is equivalent to 0.09% of the C&D waste management baseline in the Connacht Ulster Waste Region (CUWR). The predicted generation of demolition waste during the Construction Phase, results in an adverse, not significant, and short-term impact. The total forecast of surplus excavation material from the Proposed Scheme will be approximately 68,100 tonnes, and is equivalent to 8.56% of the C&D waste management baseline for the CUWR. It is estimated that approximately 19,800 tonnes of reused aggregates could be incorporated into the Proposed Scheme.

Surplus material will be beneficially re-used either on-site or off-site on other projects where feasible and subject to the material meeting the appropriate specification for its proposed end use.

The predicted impact of excavation waste during the Construction Phase, is adverse, moderate, 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.

Mitigation measures are proposed to avoid or reduce negative impacts on waste and resources during the Operational Phase.

The quantity of bitumen containing material generated, during the Operational Phase, over the assumed lifetime of the Proposed Scheme (60 years), will decrease due to an overall narrowing of the carriageway. The predicted impact of operational construction and demolition waste will be positive, 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.

8.13 Material Assets

This assessment considered the potential impacts of the Proposed Scheme on material assets. Material assets were considered in terms of:

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

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

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

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

- The Construction Compounds will require electricity to power temporary office and welfare facilities and for temporary lighting which will be required to be supplied via a connection to the grid network or a generator;
- The Construction Compounds will require a water supply for welfare facilities and spraying to prevent dust, wherever necessary;
- The Construction Compounds will require telecommunications access;
- The diversion of electricity lines in areas where there will be interfaces with the Proposed Scheme works;
- The diversion of underground watermains where there will be interfaces with the Proposed Scheme works;
- The diversion of an underground foul sewer where there will be an interface with the Proposed Scheme works;
- Upgrade works required to the surface water drainage network to accommodate for new road layouts and increased hardstanding;
- The diversion of gas mains where there will be interfaces with the Proposed Scheme works;

- The diversion of telecommunications infrastructure where there will be interfaces with the Proposed Scheme works; and
- Importation of construction materials including concrete, metals, cement, road surface materials and landscaping materials. The amount of materials required for the Proposed Scheme will represent less than one percent of the Irish quantities manufactured per year.

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

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

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

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

8.14 Risk of Major Accidents and / or Disasters

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

The risk assessment:

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

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

Risks are rated by multiplying the likelihood rating (likelihood of a risk happening which ranges from extremely unlikely to very likely) with the consequence rating (level of consequences if a major accident and / or disaster occurred, which ranges from minor to catastrophic).

This gives a risk score of low, medium or high. Low risk scores do not meet the definition of a major accident and / or disaster and high-risk scores would be considered high risk and unacceptable for the development of the Proposed Scheme and would need to be designed out. Medium risk scores would require a level of mitigation that would reduce the level of impact.

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

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

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

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

- Risk of pollution event leading to environmental damage to watercourses or groundwater, particularly associated with the potential release of silt to the aquatic environment;
- Risk of spread of invasive species during construction works, particularly during site clearance works;
- Risk of gas explosion due to the strike of a gas mains during excavation works.

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

Appropriate mitigation measures will be implemented during the Construction Phase including the implementation of a Construction Environmental Response Plan and an Environmental Incident Response Plan.

With the application of these mitigation measures, there are no remaining identified incidents or major accidents and / or 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.

8.15 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 projects.

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

The following source was considered in identifying other relevant developments for the assessment of cumulative impacts:

- National Planning Application Database (<https://data.gov.ie/dataset/national-planning-applications>) – for downloadable list of planning applications sent from Local Authorities.

The 2023 and 2038 modelling scenarios includes for cumulative traffic based on forecasted increased travel demand from general development, within the model to capture projected traffic growth from reasonably foreseeable development across the city in both years. Therefore, the air quality and noise assessments of traffic impacts consider a cumulative scenario.

Dust mitigation proposed for the Construction Phase for the Proposed Scheme, with similar measures in place for other projects, will mean that overall, there will be no significant cumulative impact that will arise from the concurrent construction of other projects identified in Appendix 20.1 of Volume 4 of this EIAR.

In respect of Climate, the construction of a wide range of projects in Ireland over the construction period of the Proposed Scheme will result in the generation of embodied carbon. When considering projects at a national scale, there is potential for significant cumulative impacts to embodied carbon. However, it should be noted that the embodied carbon contribution from the Proposed Scheme comprises a fractional proportion of Ireland's projected baseline (with additional measures) in 2024, with substantial savings in embodied carbon achieved through inherent mitigation measures. Therefore, the cumulative impacts due to embodied carbon from the Proposed Scheme in a national context is considered not significant.

With regard to Biodiversity, the construction of the Proposed Scheme in combination with other projects, will not give rise to significant cumulative impacts.

In terms of Landscape (townscape) and Visual, the construction of N6 Galway City Ring, is likely to give rise to significant, very significant and profound effects on landscape and visual along its route.

Effects on townscape, are most likely to occur at locations where concurrent construction of the Proposed Scheme and other projects have the potential to overlap. However, as the N6 Galway City Ring Road is separated from the Proposed Scheme by an intervening distance of over 2km, with no intervisibility, potential townscape and visual cumulative effects are considered to be imperceptible during construction.

For Operational Effects, the traffic assessment assumes the Proposed Scheme would be operational, along with traffic growth and GTS projects included in the Do Something scenario. The noise and air quality assessments that rely on the traffic outputs consider this cumulative operational traffic.

The contribution of operational carbon from the Proposed Scheme to the projected baseline for the transport sector for the Opening and Design Years is marginal, with the introduction of infrastructure that will enable the shift to sustainable transport modes. In addition, the vastly changing policy landscape will see significant improvements in fleet emissions across the transport sector and the subsequent projects. Therefore, the cumulative impacts due to operational carbon from the Proposed Scheme in a national context is considered not significant.

For all other disciplines, no significant cumulative impacts are predicted.

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.CrossCityLinkGalway.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.CrossCityLinkGalway.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.