Chapter 20
Cumulative Impacts & Environmental Interactions

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20 Cumulative Impacts and Environmental Interactions

20.1 Introduction

This chapter reports the assessment of potential cumulative impacts of the BusConnects Galway: Cross-City Link (University Road to Dublin Road) Scheme (hereafter referred to the Proposed Scheme) in combination with other existing and or approved projects.

In addition, the chapter addresses the potential for interactions between impacts on different environmental factors of the Proposed Scheme itself on the receiving environment.

20.1.1 Cumulative Impacts

Annex IV of the EIA Directive (2011/92/EU as amended by 2014/52/EU) requires that an EIAR provides a 'description of the likely significant effects of the project on the environment resulting from…the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.'

The EPA EIAR Guidelines (EPA 2022) define cumulative effects as:

'The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.'

Note that the EPA guidelines use the terms impacts and effects interchangeably. A relatively minor effect on a particular receptor caused by the Proposed Scheme could result in a significant effect if it is added to by impacts from other nearby projects. This chapter identifies and provides an assessment of likely significant cumulative effects caused by the Proposed Scheme in combination with other planned projects. Section 20.2 sets out the process for deciding which other planned projects were included in the assessment.

20.1.2 Environmental Interactions

Environmental interactions are the reactions between impacts, whether between the impacts of just one project (i.e., the Proposed Scheme), or between the impacts of multiple projects. For each environmental topic there will be certain interactions or interdependencies with other environmental topics, whereby impacts may interact to create a greater effect or different type of effect. An assessment of these interactions has been undertaken as required by Article 3 of the EIA Directive, which states the following:

'The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

a. Population and human health;

b. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

c. Land, soil, water, air and climate;

d. Material assets, cultural heritage and the landscape;

e. The interaction between the factors referred to in points (a) to (d).'

Some of the topic assessments within this EIAR already address environmental interactions. For example, Chapter 10 (Population) provides an assessment of effects on community amenity, which relates to the interaction of impacts on air quality; visual amenity; traffic and transport; and noise and vibration. Furthermore, Chapter 11 (Human Health) describes and assesses how a combination of impacts on health determinants (air quality; noise and vibration; community amenity; traffic and transport) can interact and influence health outcomes. Section 20.4 of this chapter sets out the main environmental interactions identified from the Proposed Scheme, sign-posting chapters which already address environmental interactions and providing a description and assessment of environmental interactions which are not addressed elsewhere in this EIAR.

20.1.3 Guidance

This assessment has been completed with reference to the following guidance documents:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022);
- Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017); and
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017).

20.2 Methodology for Cumulative Impacts Assessment

20.2.1 Source for the Identification of other Projects

Potentially relevant other projects include those from various sectors, such as residential and commercial projects, utilities, and other transport projects. The identification of other projects considered the following source:

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

All planning application data provided by each local authority is fed into the national Data.Gov.ie database (https://data.gov.ie/dataset/national-planning-

applications). This dataset was used to identify planning applications within a search area of the Proposed Scheme.

For this exercise, the database was consulted to identify all applications permitted or pending a decision over the period of 2012 - present. This included analysis of applications along the Proposed Scheme and within 200m of the Proposed Scheme, where they are likely to be significantly impacted by the Proposed Scheme. An element of professional judgement was used to identify applications within 200m of the Proposed Scheme that may be significantly impacted by the Proposed Scheme.

The EIA Portal was consulted to determine if an application included an EIAR. The planning files of each identified permission or application were analysed to determine if an NIS was included. Compliance details on the planning files were also analysed to determine if the permission was commenced, uncommenced or completed. This was cross-referenced with Google Maps imagery.

In relation to the traffic impact assessment, the traffic model in the Opening year (2023) assessment is based on the same network as the base year plus other committed schemes. The Design year (2038) assessment is based in the context of the full implementation of the Galway Transport Strategy (GTS) network re-design (including the Galway City Ring Road) in both the Do Minimum and Do Something scenarios, with the Proposed Scheme servicing the new GTS services. In addition, the model includes for forecasted increased travel demand from general development to capture projected traffic growth from reasonably foreseeable development across the city in both 2023 and 2038.

20.3 Assessment of Cumulative Impacts and Environmental Interactions

This section provides a topic-by-topic assessment of likely significant cumulative effects of the Proposed Scheme in combination with other projects, before moving on to a description of the main environmental interactions identified for the Proposed Scheme.

In total, 122 other projects, including the Proposed Scheme, were listed for further cumulative assessment. Appendix 20.1 of Volume 4 of this EIAR sets out a record of which projects were listed for assessment against the relevant topics. Reference should be made to Figure 20.1 in Volume 3 of the EIAR, for the locations of the listed projects.

20.3.1 Construction Impacts

20.3.1.1 Traffic & Transport

Appropriate construction planning of the Proposed Scheme and other nearby projects will mitigate potential cumulative impacts of general construction disruption on neighbouring communities.

Other major infrastructure projects could directly interface with the construction of the Proposed Scheme. Interface liaison will take place on a case-by-case basis through the GCC, as will be set out in the Construction Contract, to ensure that there is coordination between projects, that construction access locations remain unobstructed by the Proposed Scheme works and that any additional construction traffic mitigation measures required to deal with cumulative impacts are managed appropriately.

20.3.1.2 Air Quality

The cumulative risk to sensitive receptors as a result of dust soiling, health impacts and ecology impacts due to the construction and operational phases of the Proposed Scheme and other projects listed in Appendix 20.1 of Volume 4 of this EIAR, has been considered. The assessment methodology is described in full in Section 7.2.5 of Chapter 7 (Air Quality) of this EIAR. The projects listed in Appendix 20.1 of Volume 4 of this EIAR with the potential for cumulative effects to air quality include the following:

- Hanover Limited development comprising demolitions works and the construction of a three-story boutique hotel;
- O'Malley Group (Homes and Developments Limited) comprising demolition works and the construction of additional floors and extension;
- Seagulpoint Limited large scale residential mixed use development and urban regeneration masterplan;
- Bonha, Dock Limited mixed use office development; and
- K. King Construction Clare Galway Limited development of 27 residential units.

Without mitigation, there is the potential for cumulative dust impacts near to these other projects should the construction durations overlap. However, to ensure that no dust nuisance impacts occur to human health or ecological receptors, a series of mitigation measures have been identified that will be implemented during construction of the Proposed Scheme, as set out in Section 7.5 of Chapter 7 (Air Quality). Mitigation measures to reduce construction dust are standard practice for moderate/major scale developments likely to generate dust. With the implementation of the dust minimisation measures detailed in Section 7.5 and the CEMP (Appendix 5.1 in Volume 4 of the EIAR), fugitive emissions of dust will be insignificant and pose no nuisance at nearby receptors. Therefore, it is predicted that no significant cumulative impacts will arise from the concurrent construction of the other projects identified in Appendix 20.1 of Volume 4 of this EIAR.

A number of other local projects could directly interface with the construction of the Proposed Scheme.

As outlined in Chapter 5 (Construction, Section 5.5), liaison with third-party developers will take place on a case-by-case basis, as will be set out in the Construction Contract, to ensure that there is coordination between projects, that construction access locations remain unobstructed by the Proposed Scheme works and that any additional construction traffic mitigation measures required to deal with cumulative impacts are managed appropriately.

As outlined in Section 20.3.1, cumulative traffic volumes are included in the analysis through the use of travel demand forecasting using the NTA's Western Regional Model. Therefore, the operational noise assessment includes for the cumulative scenario, refer to Section 7.6.2 of Chapter 7 (Air Quality) for the residual impacts in relation to air quality.

20.3.1.3 Climate

The cumulative risk of climate impacts due to the construction and operational phase of the Proposed Scheme, and other projects listed in Appendix 20.1 of Volume 4 of this EIAR, has been considered. The assessment methodology is described in full in Section 8.3 of Chapter 8 (Climate).

Climate is affected by macro-scale carbon contribution rather than by local effects; therefore, projects need not be considered at a local level for the cumulative assessment, in line with IEMA guidance. As such, the zone of influence for the climate assessment is not limited to the study area and is considered on a national basis. The IEMA guidance suggests that should sectoral carbon budgets exist, the cumulative impacts can be assessed on that basis however, the sectoral carbon budgets have not been established at the time of writing this assessment.

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.

20.3.1.4 Noise & Vibration

Construction phase noise and vibration from the Proposed Scheme has been assessed in conjunction with other developments that are planned for construction in the same time period as the Proposed Scheme refer to Appendix 20.1 in Volume 4 of this EIAR.

Construction phase noise impacts in the Study Area are predicted to be negative, significant, and short term for the Proposed Scheme.

Because of the nature of the construction works along the Proposed Scheme (i.e., transient, intermittent, and short term at any one sensitive receptor) any cumulative construction noise impacts at sensitive receptors will also be intermittent, transient, and short term.

Cumulative vibration impacts are not predicted to have a significant impact on sensitive receptors.

All good practice guidelines for construction noise and vibration mitigation measures will be followed to minimise impacts at sensitive receptors during construction periods.

As outlined in Section 20.3.1, cumulative traffic volumes are included in the analysis through the use of travel demand forecasting using the NTA's Western Regional Model. Therefore, the operational noise assessment includes for the cumulative scenario, refer to Section 9.6.2 of Chapter 9 (Noise &Vibration) of this EIAR for the residual impacts in relation to noise.

20.3.1.5 Population

Cumulative construction effects on Population due to the Proposed Scheme when considered together with effects arising from other plans and projects are dealt with in relation to the factors under which Population effects might occur, particularly Traffic & Transportation, Noise & Vibration and Landscape (Townscape) & Visual. Following a review of the completed, commenced and uncommenced projects and the planning files for Galway City Council (refer to Appendix 20.1 in Volume 4 of this EIAR), it can be concluded that there is no likelihood of other significant cumulative effects arising in relation to Population and no need for a separate cumulative assessment of effects under this heading.

20.3.1.6 Human Health

Cumulative construction effects on Human Health due to the Proposed Scheme when considered together with effects arising from other plans and projects are dealt with in relation to the factors under which human health effects might occur, particularly Traffic and Transportation, Noise and Vibration and Landscape. There is no likelihood of other significant adverse cumulative effects arising in relation to Human Health and no need for a separate cumulative assessment of effects under this heading.

20.3.1.7 Biodiversity

In-combination or cumulative construction effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

As part of the assessment, in addition to the Proposed Scheme, other relevant plans and projects in the area must also be considered at this stage.

This step aims to identify at this early stage any possible significant in-combination effects of the Proposed Scheme with other such plans and projects.

While there may be a number of proposed plans or projects at any one time in the vicinity of the Proposed Scheme, this report only reviewed those approved by the planning authority.

This section of the EIAR was prepared with consideration of the policies and objectives of the Galway City Development Plan (2017-2023) in relation to Biodiversity.

The Galway City Development Plan in complying with the requirements of the Habitats Directive, Wildlife Acts and Planning & Development Acts requires that all Projects and Plans that could affect biodiversity in the same potential Zone of Influence of the Proposed Scheme site would be assessed on a case by case basis that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative effects. In this way any, in-combination impacts with Plans or Projects for the Proposed Scheme areas in which the Proposed Scheme site is located, would be avoided.

Projects considered for assessment are presented in Appendix 20.1 in Volume 4 of this EIAR.

The listed developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement for regard to the Habitats Directive. The development cannot have received planning permission without having met the consenting authority requirement in this regard.

Given, the inclusion of best practice construction management measures to be employed as per a site-specific CEMP, there is no potential for in-combination effects to occur.

There are no predicted cumulative construction 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.

20.3.1.8 Water

The Proposed Scheme was assessed for cumulative impacts with other Proposed Developments in proximity to the Study Area refer to Appendix 20.1 in Volume 4 of this EIAR.

Development proposals outlined in City and County Development plans and Local Area plans include standard surface water management strategies in the form of SUDs to mitigate against impacts on the receiving waters. Therefore, the in-combination impacts on hydrology of the proposed development and various others included in developments plans are considered imperceptible.

Other major development proposals currently underway or in planning include:

- N6 Galway City Ring Road, and
- The Galway Harbour Port Extension

The N6 Galway City Ring Road has one major crossing of the River Corrib. The EIAR for that Scheme proposed strict control measure during construction to reduce the pollution risk. It specifically proposes that there will be no in-stream works to protect the downstream water works at Terryland.

The Galway Harbour Port extension is located south of the proposed Scheme. Residual impacts identified in the EIAR of the Harbour Project relate to impacts caused by changes in salinity, sediment input, accidental spills, release of oils and fuel from construction site, dredging, etc. to which the proposed Scheme will have little or no contribution to these effects as mitigation measures will be in place to control discharges to the receiving water.

Therefore, it is concluded the effect of the Scheme in-combination with the N6 Galway City Ring Road and the Galway Harbour Port extension is imperceptible.

20.3.1.9 Land, Soils, Geology and Hydrogeology

From a Land, Soils, Geology and Hydrogeology perspective the construction phase of some of the proposed projects (refer to Appendix 20.1 in Volume 4 of this EIAR) will result in a loss of soil. In combination with the Proposed Scheme this could comprise a permanent adverse effect of the loss of a moderate to large quantity of soil across the study area. As the soil is predominately made ground with a low importance the overall cumulative impact is considered to be slight/moderate. Hence there are no likely significant direct or indirect cumulative impacts on land, soils, geology and hydrogeology during the construction phase.

20.3.1.10 Archaeological Cultural Heritage and Architectural Heritage

All permitted and proposed projects as detailed in Appendix 20.1 of Volume 4 of this EIAR were reviewed as part of the potential cumulative impact assessment. From an archaeological and cultural heritage perspective no significant negative cumulative impacts are predicted at construction. This is due to the fact that other developments already have archaeological mitigation for development in place (where applicable, at construction stage), which will allow for the preservation either by record or in-situ of any archaeological remains that may be identified. Given that the same mitigation measures are proposed for the Proposed Scheme at construction, no cumulative impacts will occur.

All permitted and proposed projects as detailed in Appendix 20.1 of Volume 4 of this EIAR were reviewed as part of the potential cumulative impact assessment. No cumulative impacts were identified upon the architectural heritage at construction stage.

20.3.1.11 Landscape (Townscape) and Visual

The proposed N6 Galway City Ring Road, permitted An Bord Pleanála (HA07.302848), is likely to give rise to significant, very significant and profound landscape and visual effects along its route. However, as it 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. No other potential significant cumulative impacts are envisaged from the construction of the projects included in Appendix 20.1 in Volume 4 of this EIAR.

20.3.1.12 Waste and Resources

A qualitative assessment has been undertaken using publicly available information to establish the cumulative effects associated with the off-site treatment of solid waste that will be generated by the construction and operational phase of the Proposed Scheme and other developments (refer to Appendix 20.1 in Volume 4 of this EIAR) that will have simultaneous requirements for landfill and treatment capacity of any C&D waste generated during the construction timeframe.

20.3.1.12.1 Baseline trends

The waste management baseline for the CUWR, established for the assessment using publicly available data from the Regional Waste Management Offices and the EPA, has been used as the baseline for the cumulative assessment in Section 17.3 of Chapter 17 (Waste and Resources) of this EIAR, set out permitted and licensed capacity and Article 27 notifications for 2020. This data has been used to establish a baseline for 2020. The available C&D waste and by-product capacity in CUWR for 2020 is approximately 796,000 tonnes based on the following assumptions, see Table 20.1:

- Using the available capacity for permitted facilities for construction and demolition wastes;
- Including only licensed facilities accepting soil and stones; and
- Including all Article 27 notifications dated 2020 in the CUWR.

Table 20.1: C&D Waste Management Baseline for CUWR, 2020 (Permitted, Licensed and Article 27 Notifications)

C&D Waste Management Baseline for 2020	Capacity / Annual Intake (Tonnes)
Minimum Permitted capacity (Regional Waste Management Office (Offaly County Council, 2021)	685,316
Licenced annual intake (soil and stone facilities) (EPA 2022)	90,000
Article 27 (by-product) notifications (EPA 2021c)	20,500
Total	795,796

Therefore, the authorised C&D waste and by product tonnage in CUWR in 2020, and so the construction and operation waste baseline, is an estimated 796,000 tonnes per annum.

The Regional waste authorities state in the publication *Construction and Demolition Waste Management Plans 2015-2021: Update Report 2020*, which sets out the national capacity of primarily soil and stone treatment facilities:

'In comparison to [the East Midlands and Southern] regions, the CUR had just 10% of the remaining national capacity at the end of 2018.'

The Update Report sets out that there were four inert landfill facilities active nationally in 2018, all located in the EMR.

20.3.1.12.2 Key developments

A list of developments that have been taken into account in the cumulative effects assessment is provided in Appendix 20.1 in Volume 4 of this EIAR. Due to the nature of waste management in Ireland cumulative effects for waste have been considered on a regional basis. A short-list of proposed developments planned within the region, was also developed, including having regard to those projects set out in Project 2040 (Department of Public Expenditure and Reform 2018; Investment Projects and Programmes Office 2019). These projects were reviewed and screened base on the following criteria:

- Construction phases likely to overlap with the Proposed Scheme - where unknown, overlap is considered as worst case;
- Similar project waste profile is expected to be generated i.e. tunnelling excavation material, soil and stones and bitumen containing material.

A list of regional developments that have been taken into account in the cumulative effects assessment is provided in Table 20.2:

Table 20.2: Regional Developments Included in Cumulative Assessment

Project Name	Project Type	Anticipated Construction completion (year) where known	Waste type likely to be generated
Galway City Ring Road	The proposed road development comprises 11.8km of motorway between the existing N6 at Coolagh (northeast of the city) to the existing Ballymoneen Road (northwest of the city) and then continues as a single carriageway road for a further 5.6km as far as the R336 Coast Road, west of Bearna.	2025	• Soil and stones • Bitumen containing material • General C&D waste
N5 Ballaghaderreen	The project comprises a proposed road development of 33.4km which consists of a single carriageway road. There are	2024	• Soil and stones • Bitumen containing

Project Name	Project Type	Anticipated Construction completion (year) where known	Waste type likely to be generated
to Scramoge	an additional 13km of side road improvements, 17 at-grade T-junctions and 5 roundabouts to be provided as part of the scheme.		material • General C&D waste
N59 Moycullen Bypass	This scheme consists of 4.3km of single carriageway bypassing the village of Moycullen to the northeast. The project extends from the townland of Drimcong, approximately 1.5km north-west of Moycullen village to the townland of Clydagh, approximately 2km southeast of the village.	2023	• Soil and stones • Bitumen containing material • General C&D waste
No. 26 & No. 34 Nun's Island Street, Galway	Permission for development which will consist of a) demolition of existing derelict buildings including a habitable house on site (327 sqm) b) three storey over part-basement boutique hotel of 1239 sqm containing 34 bedrooms and ancillary spaces and a balcony.	TBC	• General C&D waste
Lands to the rear of Ceannt Train Station, Galway	10 year permission - construction of mixed use regeneration project including 376 no. apartments, retail units, cafe/restaurant/bar units, Hotel, office use, childcare facility, car parking and other services and associated site works.	2026	• General C&D waste
Woodlands Centre Renmore Galway	Development which will consist of the construction of a new 3,640 sq. m. single storey special school including staff and visitor car parking, bus drop-off areas, new perimeter boundary walls and fences, removal of selected trees	TBC	• Soil and stones • Bitumen containing material • General C&D waste

The developments identified comprise a mixture of major infrastructure transport projects, commercial and residential developments. Each development would generate solid waste from construction and from operation for management within the regional areas. Waste will generally be generated over the period of construction for each development. Additionally, waste generation will vary over time as the nature of the projects are multi-year and are undertaken with a phase approach i.e., demolition, excavation and construction.

20.3.1.12.3 Cumulative Construction Effects

Construction of developments within the region will produce Construction and Demolition (C&D) waste, a proportion of which will be sent for recycling, further treatment or disposal to landfill. In line with relevant policy, also applicable to the Proposed Scheme, it is anticipated that all these developments will seek to minimise disposal to landfill and manage waste in accordance with the waste hierarchy.

The Proposed Scheme, together with the developments listed in Appendix 20.1 in Volume 4 of this EIAR will add to the need for off-site capacity for recovery, recycling, treatment and disposal of waste to landfill. Many of the listed projects are in very early stages so documentation hasn't been published or associated planning documents submitted which would include waste generation estimates however is anticipated that the proposed developments will give rise to rise to similar types of wastes to the Proposed Scheme and that the quantities will vary depending on the type of project

Opportunities are likely to continue to arise during the construction phase of other developments to provide C&D waste and surplus excavated material for use in other local construction projects thereby increasing diversion of such materials from landfill.

It was acknowledged the volumes of waste being generated would support the provision of further licensed capacity:

> *"The CUR has 3% of the national capacity. New licensed facilities are also due to come on stream."*

The construction phase impact of the Proposed Scheme has been assessed as resulting in a not significant short-term and adverse.

Considering therefore the likely potential for waste generation from other developments, the opportunities to divert waste from off-site treatment and the amount of inert, non-hazardous and hazardous waste treatment capacity likely to be available on in the region in the coming years over the time period for the delivery of the Proposed Scheme, it is considered that there will be no likely significant effects as a result of the construction of the Proposed Scheme in combination with the construction of other developments.

20.3.1.13 Material Assets

Material quantities required for the construction of the Proposed Scheme are considered insignificant and therefore no likely significant cumulative effects on material assets are predicted as a result of the Proposed Scheme in combination with other proposed development in Galway.

20.3.2 Operational Impacts

20.3.2.1 Traffic & Transport

As detailed in Section 6.3 of Chapter 6 (Traffic & Transport) of this EIAR all core modelling scenarios (Do Minimum and Do Something) have taken into account committed transport schemes for Galway City and its environs, as part of the Galway Transport Strategy (GTS) and those likely to be completed for the various years assessed. This comprises the following schemes in the 2023 and 2038 modelling scenarios as outline in Table 20.3.

Table 20.3: Schemes included in the 2023 to 2038 Do Minimum Scenario

Scheme (Modelling Year)	Description	Committed Scheme	GTS Scheme
Martin Junction (2023 and 2038)	Upgrade from a roundabout to a signalised junction	**X**	
GTS Bus Services (2023 and 2038)	Brown, red, blue, green and yellow bus routes to replace existing local bus services 401-412 and 414.		**X**
Galway City Ring Road (2038)	N6 to R336 Barna Road	**X**	
Skerlett Roundabout Signalisation (2038)	Upgrade from a roundabout to a signalised junction.		**X**
N59 Dangan Upgrade (2038)	Speed limit increase		**X**
W4 BC2 - Tuam Road Bus Corridor (2038)	It is proposed to install an outbound shared bus/cycle lane from the junction with Wellpark Road/Connolly Avenue, north to the junction with the Tuam Rd and east to the junction with Bóthar na dTreabh		**X**
W6 BC4 - Father Griffin Road Corridor (2038)	It is proposed to reduce vehicle speeds to advertise the presence of pedestrians and cyclists.		**X**
W7 BC5 - Monivea Road Scheme (2038)	Add an on-road bus priority to allow buses to travel to the Briarhill Junction.		**X**
W9 BC7 - Western Distributor Road Corridor (2038)	It is proposed to transform Blake and Athy roundabouts into signalised junctions and add bus lanes in both direction along the road.		**X**

Scheme (Modelling Year)	Description	Committed Scheme	GTS Scheme
W11 BC9 - Rahoon Road Bus Lane	Adding an inbound bus lane from Rahoon Cemetery to the junction with Seamus Quirke Road.		**X**
W13 BC11 - Galway Bus Connects (2038)	It is proposed to install bus corridors all along Dublin Rd from Martin Roundabout to Moneenageisha Junction (about 4km long) in both directions.		**X**
New Link from Liosban to N6 (2038)			**X**
Browne Roundabout (2038)	Upgrade from a roundabout to a signalised junction		**X**
Blake Roundabout (Ballymoneen Road) (2038)	Upgrade from a roundabout to a signalised junction		**X**
Athy Roundabout (Clybaun Road) (2038)	Upgrade from a roundabout to a signalised junction		**X**
Bothar Stiofan Roundabout (2038)	Upgrade from a roundabout to a signalised junction		**X**
Gort na Bro Roundabout (2038)	Upgrade from a roundabout to a signalised junction		**X**
Deane Roundabout (2038)	Upgrade from a roundabout to a signalised junction		**X**
D'arcy (Salthill) Roundabout (2038)	Upgrade from a roundabout to a signalised junction		**X**
Joyce Roundabout (Cemetry Cross) (2038)	Upgrade from a roundabout to a signalised junction		**X**
Bus lanes (2038)	Bus lanes on Salthill Road, Doughiska Road, Parkmore Road and Tuam Road		**X**
Park and Ride	P&R Sites at Cappagh Road, Galway		**X**

Scheme (Modelling Year)	Description	Committed Scheme	GTS Scheme
(2038)	Clinic and Tuam Road.		

Cumulative traffic volumes are included in the analysis through the use of travel demand forecasting using the NTA's Western Regional Model.

20.3.2.2 Air Quality

The cumulative risk to sensitive receptors as a result of the operational phase of the Proposed Scheme and other projects listed in Appendix 20.1 of Volume 4 of this EIAR, have been considered.

As outlined in Section 20.3.1, cumulative traffic volumes are included in the analysis through the use of travel demand forecasting using the NTA's Western Regional Model. Therefore, the operational noise assessment includes for the cumulative scenario, refer to Section 7.6.2 of Chapter 7 (Air Quality) of this EIAR for the residual impacts in relation to air quality.

20.3.2.3 Climate

The cumulative risk of climate impacts due to the construction and operational phase of the Proposed Scheme, and other projects listed in Appendix 20.1 of Volume 4 of this EIAR, has been considered. The assessment methodology is described in full in Section 8.3 of Chapter 8 (Climate) of this EIAR.

Climate is affected by macro-scale carbon contribution rather than by local effects; therefore, projects need not be considered at a local level for the cumulative assessment, in line with IEMA guidance. As such, the zone of influence for the climate assessment is not limited to the study area and is considered on a national basis. The IEMA guidance suggests that should sectoral carbon budgets exist, the cumulative impacts can be assessed on that basis however, the sectoral carbon budgets have not been established at the time of writing this assessment.

The Climate Action and Low Carbon Development Act, 2021, as amended, commits to a reduction in greenhouse gas emissions such that the total amount of annual greenhouse gas emissions in the year ending on 31 December 2030 is 51 per cent less than the annual greenhouse gas emissions reported for the year ending on 31 December 2018. Policy changes will include the acceleration of the electrification of the transport system, including electric bikes, electric vehicles and electric public transport, alongside a ban on new registrations of petrol and diesel cars from 2030. In addition, there is a policy to ensure an unprecedented modal shift in all areas by a reorientation of investment to walking, cycling and public transport.

The 2038 Do Minimum and Do Something scenarios assumes a number of transport schemes to be in the traffic model including the roll out of the Galway Transport Strategy (GTS) as well as general traffic growth.

As noted above the cumulative impacts to climate are considered at a national level due to the macro-scale impacts of GHG emissions, therefore, there is potential for significant cumulative impacts to operational carbon. However, it should be noted that 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 that 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.

The Proposed Scheme is not expected to result in a significant cumulative impact to climate change vulnerability in combination with other projects due to the not significant impacts predicted for the operational phase of the Proposed Scheme.

Overall, it is considered that the cumulative residual effects as a result of the Proposed Scheme's operation is not significant.

20.3.2.4 Noise & Vibration

Predicted traffic noise levels from the Proposed Scheme have been assessed in conjunction with other developments in the Study Area that have received planning permission or have applied for planning permission to determine the cumulative noise impacts on the surrounding noise sensitive community. Developments that are already operational will have been included in the noise measurements and assessed as part of the baseline environment.

Only one planning applications has been found to be relevant from a noise point of view. The details for this application are:

- Planning registration number 20/47 (ABP: PL61.310568) for a large scale development near the Galway Railway Station

Noise levels from the development have been assessed as part of the EIAR prepared for the development. Levels were predicted to be neutral, imperceptible, and long term.

In the vicinity of the proposed development, changes in noise levels due to the Proposed Scheme are not predicted to be significant and therefore no significant cumulative noise effects are predicted from the Proposed Scheme.

Vibration levels from the Proposed Scheme are not predicted to be perceptible, and therefore no cumulative impact is predicted.

As outlined in Section 20.3.1, cumulative traffic volumes are included in the analysis through the use of travel demand forecasting using the NTA's Western Regional Model. Therefore, the operational noise assessment includes for the cumulative scenario, refer to Section 9.6.2 of Chapter 9 (Noise and Vibration) of this EIAR for the residual impacts in relation to noise.

20.3.2.5 Population

The Population assessment considered potential cumulative effects on land-take, amenity and accessibility during operation. No potential likely significant cumulative impacts on the receptors assessed in Chapter 10 (Population) of this EIAR were identified during operation.

20.3.2.6 Human Health

Cumulative effects on Human Health due to the operation of the Proposed Scheme when considered together with effects arising from other plans and projects are dealt with in relation to the factors under which human health effects might occur, particularly Traffic and Transportation, Noise and Vibration and Landscape. There is no likelihood of other significant cumulative effects arising in relation to Human Health and no need for a separate cumulative assessment of effects under this heading.

20.3.2.7 Biodiversity

No significant cumulative operational impacts on biodiversity are envisaged.

20.3.2.8 Water

This conclusion applies to the operational phase of the Scheme as no significant cumulative effects (direct and indirect) are anticipated from the projects discussed above (refer to section 20.3.1.8) and hence no additional mitigation measures are necessary or required.

20.3.2.9 Land, Soils, Geology and Hydrogeology

The operational phase of some of the proposed projects (refer to Appendix 20.1 in volume 4 of this EIAR) will increase the area of impermeable hard standing in the area which could cumulatively reduce the recharge rate. In the centre and east of the Proposed Scheme the area is underlain by a Regionally Important Aquifer. The west is underlain by a Poor Aquifer.

The areas underlying the Proposed Scheme are generally described as having a relatively low recharge and largely comprise roads which already impede recharge. Hence the impact of the Proposed Scheme is considered to be negligible on both aquifers.

As the area of the Proposed Scheme is larger than the other developments and has a negligible effect the combined effect of each proposed development with the effects of the Proposed Scheme are not likely to be any greater than negligible. Consequently, the combined effect of the Proposed Scheme in combination with each individual development is considered to be negligible. Hence the significance will be imperceptible and there are no likely significant direct or indirect cumulative impacts on land, soils, geology and hydrogeology during the operational phase.

20.3.2.10 Archaeological Cultural Heritage & Architectural Heritage

Archaeology and Cultural Heritage

All permitted and proposed projects as detailed in Appendix 20.1 of Volume 4 of this EIAR were reviewed as part of the potential cumulative impact assessment. From an archaeological and cultural heritage perspective no significant negative cumulative impacts are predicted at the Operational Phase.

Architectural Heritage

All permitted and proposed projects as detailed in Appendix 20.1 of Volume 4 of this EIAR were reviewed as part of the potential cumulative impact assessment. Four of the projects, as listed below, were identified that may result in negative cumulative impacts upon the architectural heritage resource at operation stage:

- ABP Planning Ref.: JP61.308783. Salmon Weir Pedestrian and Cycle Bridge. Construction of new pedestrian bridge to the south of the Salmon Weir Bridge and associated footpaths and plaza.
- Galway CC Planning Ref.: 19/157. Permission to demolish existing Guesthouse at No 3 Newtownsmith along with existing outbuildings. Permission to construct a new 3 Storey Mixed use building at 3 Newtownsmith.
- Galway CC Planning Ref.: 17/59. Permission for a change of use of existing shop to use as a restaurant with ancillary take away.
- Galway CC Planning Ref.: 14/18. Permission for development at Ceannt Station (a protected structure). Northern Elevation: The construction of a new 95 square metres single storey fully accessible glazed entrance building, the extension of the existing North Eastern bay platform, new 2m high boundary treatment to enclose this platform extension.

However, there would be no significant potential impacts from the Proposed Scheme in the locations where each of these projects are located. The new pedestrian bridge at Salmon Weir will facilitate the use of the vehicular bridge for the Proposed Scheme. Newtownsmith will be pedestrianised and no additional historic fabric relating to the streetscapes and the river will be lost due to both projects being carried out. In relation to Project 19/157, the historic structure located within this plot will be left in-situ and as such architectural heritage resource will not be affected. With regards to project 14/18 the proposed change to the elevation of the structure (considered in relation to the Eyre Square ACA) is very minimal and would not affect the overall character of the square when considered in tandem with the Proposed Scheme. With regards to project 14/18, the project is considered well set back from Eyre Square and the ACA and as such, would not result in an overall negative cumulative impact.

20.3.2.11 Landscape (Townscape) and Visual

Following a review of the projects included Appendix 20.1 in Volume 4 of this EIAR and as would be expected in a city centre urban environment, there are a large number of planned or permitted projects in close proximity to the proposed development, consisting of alternations to and new construction of commercial, retail, residential, institutional and infrastructural projects. All combined, these are considered to be consistent with the normal pattern of change and improvement to the city's landscape and visual environment. From a landscape and visual perspective, there are a number of infrastructure projects within the city related to the Galway Transport Strategy considered for assessment including:

- Salmon Weir Pedestrian and Cycle Bridge (JP61.308783) is to be constructed to the south of the Salmon Weir bridge. Once operational the proposed bridge will have a significant positive and permanent effects on pedestrian and cycle movement in this sensitive urban townscape setting of Galway City. Combined with the Proposed Development's pedestrianisation of Gaol Road and Newtownsmith, and public realm improvements in the area, the potential townscape and visual effects are considered to be significant, positive and permanent (see Figures 16.1.3.2, 16.1.4.2 and 16.1.5.2 in Volume 3 of this EIAR).
- The proposed N6 Galway City Ring Road, permitted An Bord Pleanála (HA07.302848), is likely to give rise to significant, very significant and profound landscape and visual effects along its route. However, as it is separated from the proposed development by an intervening distance of over 2km, with no intervisibility, potential townscape and visual cumulative effects are considered to be imperceptible during operation.

20.3.2.12 Waste & Resources

The predominant source of operational phase waste from the Proposed Scheme may arise as a result of carriageway maintenance which will be undertaken at regular intervals, or as necessary. This will primarily consist of bitumen containing material due to maintenance of carriageway pavement. The predicted impact of operational construction and demolition waste will be positive, not significant and long-term. It is therefore considered that the operational phase waste arising from the Proposed Scheme considered on combination with the types of waste arising from other developments will not give rise to likely significant cumulative effects.

20.3.2.13 Material Assets

No likely significant cumulative effects were identified for Material Assets for the Operational Phase.

20.4 Environmental Interactions

Table 20.4 sets out a matrix to indicate where interactions between different effects on different environmental factors have been addressed.

This is in line with the approach set out in the EIAR Guidelines (EPA 2022). These interactions are described briefly in Table 20.4.

Table 20.4: Environmental Interactions Matrix

Typical Inter-Relationship Matrix – Environmental Elements	Population		Human Health		Biodiversity		Land, Soils, Geology & Hydrogeology		Water		Air Quality		Climate		Noise & Vibration		Waste		Landscape(Townscape) & Visual		Cultural Heritage		Architectural Heritage		Material Assets		Traffic & Transport		Major Accidents and / or Disasters	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Population																														
Human Health																														
Biodiversity																														
Land, Soils, Geology & Hydrogeology																														
Water																														
Air Quality																														
Climate																														
Noise & Vibration																														

Typical Inter-Relationship Matrix – Environmental Elements	Population		Human Health		Biodiversity		Land, Soils, Geology & Hydrogeology		Water		Air Quality		Climate		Noise & Vibration		Waste		Landscape(Townscape) & Visual		Cultural Heritage		Architectural Heritage		Material Assets		Traffic & Transport		Major Accidents and / or Disasters	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Waste																														
Landscape(Townscape) &Visual																														
Cultural Heritage																														
Architectural Heritage																														
Material Assets																														
Traffic & Transport																														
Major Accidents and / or																														

Notes: This matrix should be read down, starting with each topic identified across the top. □□= significant interaction between. Blank cells indicate no or weak interaction. Con. = Construction phase. Op. = Operational phase.

20.4.1.1 Interactions between Population and Air Quality, Noise and Vibration and Landscape (Townscape) and Visual

Chapter 10 (Population) of this EIAR assesses impacts on amenity, which involves an assessment of the interactions between Landscape (Townscape) & Visual, Air Quality, Noise and Vibration. It therefore inherently addresses environmental interactions during both the Construction and Operational Phases. Reference should be made to Chapter 10 (Population) of this EIA for the assessments on commercial and community amenity. Visual impacts and landscape impacts on properties have been assessed in Chapter 16 (Landscape (Townscape) & Visual) of this EIAR.

20.4.1.2 Interactions between Human Health, Land, Soils, Geology & Hydrogeology, Water, and Air Quality and Noise &Vibration

The quality of the environment, including exposure to pollution and environmental hazards, is an important consideration in health protection. The Human Health assessment reported in Chapter 11 of this EIAR has considered the interaction of these environmental factors on human health.

Chapter 11 (Human Health) of this EIAR has assessed the interaction between Air Quality (Chapter 7) and Noise and Vibration (Chapter 8) and Human Health(Chapter 11) of this EIAR. Reference should be made to Chapter 11 (Human Health) for an assessment of potential health outcomes linked with these issues during the Construction and Operational Phases.

Chapter 13 (Water) of this EIAR assesses a variety of potential impacts on water including impacts on water quality and impacts on flood risk, both of which have an interaction with human health.

Chapter 14 (Land, Soils, Geology & Hydrogeology) of this EIAR assesses the potential for the excavation of contaminated ground, which can pose an environmental health hazard.

20.4.1.3 Interactions between Human Health and Landscape (Townscape) and Visual

The assessment of Human Health (Chapter 11) has an indirect interaction between Landscape (Townscape) and Visual (Chapter 16) via the assessment of amenity in Chapter 10 (Population) of this EIAR.

20.4.1.4 Interactions between Traffic & Transport and Material Assets

Material assets are resources of both natural and human origin that have intrinsic value. Chapter 18 (Material Assets) of this EIAR provides an assessment of impacts on major infrastructure and utilities and imported materials.

The chapter notes that other types of material assets are assessed in other chapters of the EIAR, for example, roads and traffic are assessed in Chapter 6 (Traffic & Transport).

20.4.1.5 Interactions between Population, Human Health, Air Quality, Noise and Vibration and, Traffic and Transport

There is significant interaction between these topics. The Traffic and Transport assessment has informed the assessments of Population, Human Health, Air Quality and Noise and Vibration. The Population assessment has considered effects on accessibility which directly interacts with Traffic and Transport. The Population assessment has also assessed effects on amenity which relate to traffic emissions of air pollution and noise, which indirectly interact with Traffic and Transport. The Human Health assessment has considered the evidence of associations with health outcomes from exposure to air pollution, traffic noise as well as changes to wider determinants of health such as traffic and transport, and access. It is considered that the key interactions for both Construction and Operational Phases, are inherently captured across Chapter 6 (Traffic & Transport), Chapter 7 (Air Quality), Chapter 9 (Noise & Vibration), Chapter 10 (Population) and Chapter 11 (Human Health) of this EIAR.

20.4.1.6 Interactions between Biodiversity, Traffic and Transport, Land, Soils, Geology and Hydrogeology; Water; and Air Quality; Noise and Vibration and, Landscape (Townscape) & Visual

The biodiversity assessment has considered the interactions between species, habitats and various other environmental issues. Specifically, there is an interaction between Traffic and Transport and mortality risk for species. There is an interaction between Water, Air Quality and Biodiversity as declines in surface water pollution and air pollution can contribute to habitat degradation. Non-native invasive plant species can be spread through soils, and also contribute to habitat degradation, meaning there is an interaction with Biodiversity. Some trees and areas of other planting will be removed during the Construction Phase as set out in in Chapter 16 (Landscape (Townscape) & Visual) of this EIAR. However, the Proposed Scheme also includes for replacement and new trees and other planting, with associated opportunities for enhancement of local biodiversity. While it will take time for new trees to establish and mature, no significant medium or long-term impact arises from the interrelationship between biodiversity and landscape and visual factors. Chapter 12 (Biodiversity) of this EIAR describes and assesses how different impacts of the Proposed Scheme on traffic, water, soils, air quality, noise and landscape may interact with biodiversity interests. Reference should be made to Chapter 12 (Biodiversity) of this EIAR to understand those interactions.

20.4.1.7 Interactions between Land, Soils, Geology and Hydrogeology and Water

There is an interaction between Chapter 14 (Land, Soils, Geology & Hydrogeology) and Chapter 13 (Water) of this EIAR. Chapter 14 (Land, Soils, Geology & Hydrogeology) assesses potential pollution of groundwater and watercourses from potential land contamination. There is therefore a potential interaction between land contamination and surface water. Surface water is interlinked with hydrogeology, so while impacts on these issues are assessed in separate chapters, there is an interrelationship. It is considered that these interactions are captured within Chapter 14 (Land, Soils, Geology & Hydrogeology) and Chapter 13 (Water) since they are intrinsic to the assessments.

20.4.1.8 Interactions between Land, Soils, Geology & Hydrogeology, Waste & Resources and Material Assets

The main interaction between these topics will be during the Construction Phase.

Chapter 18 (Material Assets) assesses the impact of imported materials, whereas Chapter 17 (Waste & Resources) assesses the use of site-won materials which can be re-used within the Proposed Scheme. There is an interaction between these issues as the amount of material to be imported will depend on the amount of material which can be recovered and re-used on-site. Chapter 14 (Land, Soils, Geology & Hydrogeology) provides an assessment of impacts on soils, including potentially contaminated land. There is an interaction between this issue and waste because the likelihood of excavated materials being suitable for use on site will depend on whether or not it is contaminated, and the type of contamination. One of the main reasons for undertaking any excavation of soils as part of the Proposed Scheme is to allow for utility diversions. The need to utility diversions is assessed in Chapter 18 (Material Assets), whereas the likelihood of encountering contaminated materials from this activity is assessed in Chapter 14 (Land, Soils, Geology & Hydrogeology).

20.4.1.9 Interactions between Water and Traffic & Transport

Chapter 13 (Water) identifies the potential impact from the interaction between traffic and transport and the water environment. It refers to traffic modelling described in Chapter 6 (Traffic & Transport) to inform the likelihood of a significant impact on pollutants and sediment from road surface run-off.

20.4.1.10 Interactions between Climate, Air Quality, Material Assets, Waste & Resources and Traffic & Transport

Chapter 8 (Climate) provides an assessment of the effects of the Proposed Scheme on greenhouse gas (GHG) emissions.

There is an interaction between Climate and Material Assets as the amount of material to be imported, and waste generated during construction of the Proposed Scheme, influences the embodied carbon footprint of the Proposed Scheme, which is assessed in Chapter 8 (Climate).

The redistribution of traffic associated with the traffic management during the operational phase (Chapter 6 (Traffic & Transport)), will also generate GHG emissions, which has informed the assessment in Chapter 8 (Climate).

20.4.1.11 Interactions between Climate and Water

The impact of climate change is considered in the flood risk assessment (Appendix 13.1 in Volume 4 of this EIAR), which is summarised in Chapter 13 (Water) and Chapter 8 (Climate). The interaction between climate change and flood risk is therefore captured in these assessments.

20.4.1.12 Interactions between Landscape (Townscape) & Visual

As an environmental factor landscape and visual considerations have natural relationships with all other environmental factors. Some are clearly 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, material assets and landscape and visual aspects. Wherever possible these potential interactions have been incorporated into the landscape and visual impact assessment presented in Chapter 16 (Landscape (Townscape) & Visual.

20.4.1.13 Risk of Major Accidents and / or Disasters and other topics

Chapter 19 (Risk of Major Accidents and / or Disasters) inherently considers several potential interactions. For example, it assesses the risk of impacts on or from utilities (interacting with Chapter 18 (Material Assets)) such as a gas mains strike. It assesses the risk of tree instability, which has an interaction between Chapter 16 (Landscape (Townscape) & Visual) and it assesses the risk of spreading invasive species which is interrelated with Chapter 12 (Biodiversity) and Chapter 14 (Land, Soils, Geology & Hydrogeology). Also related to Chapter 14 (Land, Soils, Geology & Hydrogeology) is the risk of encountering contaminated ground or materials. Chapter 19 (Risk of Major Accidents and / or Disasters) assesses the risk of extreme weather events, which are linked to Chapter 8 (Climate) and flood risk Chapter 13 (Water) and Appendix 13.1 in Volume 4 of this EIAR). The risk of a major road traffic event due to construction traffic is also assessed in Chapter 19 (Risk of Major Accidents and/or Disasters) which is an issue interrelated with Chapter 6 (Traffic and Transport) as well as Chapter 11 (Human Health). Since all identified risks have the potential to harm human health, the assessment in Chapter 19 (Risk of Major Accidents and / or Disasters) is strongly interrelated to human health.

20.5 Mitigation

20.5.1 Construction Phase

Appropriate construction planning of the Proposed Scheme and other nearby projects will mitigate potential cumulative impacts of general construction disruption on neighbouring communities.

Other major infrastructure projects could directly interface with the construction of the Proposed Scheme. Interface liaison will take place on a case-by-case basis through the GCC, as will be set out in the Construction Contract, to ensure that there is coordination between projects, that construction access locations remain unobstructed by the Proposed Scheme works and that any additional construction traffic mitigation measures required to deal with cumulative impacts are managed appropriately.

20.5.2 Operational Phase

No significant negative effects over and above those considered in the standalone assessments for the operational phase were predicted in the cumulative impact assessment. No additional mitigation measures are considered necessary.

20.6 Summary of Residual Cumulative Impacts and Environmental Interactions

This chapter has identified and assessed the likely significant cumulative effects caused by the Proposed Scheme in combination with other existing and planned projects. This section provides a summary of the main effects predicted.

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

In brief, the Proposed Scheme will provide for considerable journey time reliability for existing bus services coming into and running through the city centre while also cumulatively 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 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 the Galway Cathedral.

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.

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