Chapter 06
Traffic & Transport

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6 TRAFFIC AND TRANSPORT

6.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) has considered the potential traffic & transport impacts associated with the Construction and Operational Phases of the BusConnects Galway: Dublin Road scheme (hereafter referred to as the Proposed Development).

The chapter describes the traffic and transport impacts in accordance with the requirements of the relevant Environmental Protection Agency's (EPA) guidance on the information to be contained in EIARs (EPA 2022)[1].

The Proposed Development, as described in detail in Chapter 4 (Proposed Development Description), is a high quality multi modal corridor between the Moneenageisha Junction in the west to the Doughiska Junction in the east.

The Proposed Development includes an upgrade of the existing bus priority alongside changes to pedestrian and cycle facilities. The Proposed Development includes a substantial increase in the level of bus priority in Galway, including the provision of additional lengths of bus lane resulting in improved journey time reliability.

Throughout, the Proposed Development will be enhanced to improve the overall journey experience for bus passengers while cycle facilities will be substantially improved with segregated cycle tracks provided along the corridor with enhanced signalling for cyclists provided at junctions.

Moreover, pedestrian facilities will be upgraded, and additional signalised crossings will be provided. In addition, public realm works will be undertaken at key locations with planting and street furniture provided to enhance the pedestrian experience. The proposed treatment of the space surrounding the Lynch's/Mile Stone will follow the palette of Galway Public Realm Strategy (Galway City Council 2019) ("the strategy"). The strategy provides a palette for general upgrades across the city. Here the focus as regards implementing the strategy is on lifting the quality of streetscape and achieving a level of consistency in the design approach.

Table 6-1 summarises the changes which will be made to the existing transport environment along the corridor as a result of the Proposed Development.

Table 6-1: Summary of the Proposed Development

Total Length of Proposed Development	**3.9km**	
Bus Priority	**Existing (km)**	**Proposed Development (km)**
Bus Lanes		
Inbound	0.8km	3.9km
Outbound	2.7km	3.9km
Bus Priority through Traffic Movement		
Inbound	0.798km	3.9km

[1] https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment-reports-eiar.php

Total Length of Proposed Development	3.9km	
Bus Priority	**Existing (km)**	**Proposed Development (km)**
Outbound	2.888km	3.9km
Total Bus Priority (both directions)	48.5%	100%
Bus Measures		
Proportion of Route with Priority Measures	48.5%	100%
Cycle Facilities - Segregated		
Inbound	N/A	3.8km
Outbound	N/A	3.8km
Cyclist Facilities – Non-segregated		
Inbound	N/A	0
Outbound	N/A	0
Total Cyclist Facilities (both directions)	N/A	100%
Proportion Segregated (including Quiet Street Treatment)	0%	0%
Other Features		
Number of Traffic Signal Controlled Junctions	6	9
Number of Signal Crossings	1	2

The following drawings (listed in Table 6-2) should be read in conjunction with this chapter.

Table 6-2: Drawing Number and Description

Drawing Series Number	Description
BCGDR-BTL-GEO_GA-XX-DR-CR-00001_00013	General Arrangement
BCGDR-BTL-GEO_CS-XX-DR-CR-00001_00006	Typical Cross Sections
BCGDR-BTL-TSM_KP-XX-DR-CR-00001	Traffic Signs and Road Markings

Cumulative impacts of Traffic and Transport, together with other potential impacts, can be found in Chapter 20 (Cumulative Impacts & Environmental Interactions) of this EIAR, as well as in Volume 4 - Appendix 6.1 (Transport Modelling Report) of this EIAR.

6.1.1 Aim and Objectives of the Proposed Development

The aim of the Proposed Development is to provide enhanced walking, cycling and bus infrastructure on this key access corridor to the east of Galway City, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the works, applicable to the Traffic and Transport assessment of the Proposed Development, are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus priority measures and bus lanes to provide priority to bus movement over general traffic movements;
- Enhance the potential for cycling by providing a safe network for cycling;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;

- Enable compact growth, regeneration opportunities and more effective use of land in Galway, 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 Development has been guided by these aims and objectives, with the need for the Proposed Development described in detail in Chapter 2 (Need for the Proposed Development) of this EIAR.

6.1.1.1 People Movement

The aims and objectives outlined above are underpinned by the central concept and design philosophy of 'People Movement'. People Movement is the concept of the optimisation of roadway space and/or the prioritisation of the movement of people over the movement of vehicles along the route and through the junctions along the Proposed Development. The aim being the reduction of journey times for higher capacity modes of transport (bus, walking and cycling), which in turn provides significant efficiencies and benefits to users of the transport network and the environment.

A typical double-deck bus takes up the same road space as three standard cars but typically carries 50-100 times the number of passengers. On average, a typical double-deck bus carries approximately 60-70 passengers making the bus typically 20 times more efficient in providing people movement capacity within the equivalent spatial area of three cars. These efficiency gains can provide a significant reduction in road network congestion where the equivalent car capacity would require 50 or more vehicles based on average occupancy levels. Consequently, by prioritising the movement of bus over cars, significantly more people can be transported along the limited road space available. Similarly, cyclists and pedestrians require significantly less roadway space than general traffic users to move safely and efficiently along the route. Making space for improved pedestrian infrastructure can significantly benefit this sustainable mode and encourage greater use of this mode.

With regards to this traffic and transport chapter, People Movement is the key design philosophy, and the Proposed Development impacts (both Positive and Negative) have been assessed on that basis.

6.1.2 Iterative Design Process and Mitigation by Design

Throughout the development of the Preliminary Design for the Proposed Development there have been various design stages undertaken based on a common understanding of the maturity of the design at a given point in time. Part of this process was to ensure the environmental and transport impacts were mitigated to the greatest extent possible during design development and to enable information on potential impacts to be provided from the various Environmental Impact Assessment (EIA) and Transport Impact Assessment (TIA) disciplines back into the design process for consideration and inclusion in the proposals. This resulted in mitigation being embedded into the design process by the consideration of potential environmental impacts throughout the Preliminary Design development. A multi-tiered modelling framework, as described in Appendix 6.1 (Transport Modelling Report) in Volume 4 of this EIAR, was developed to support this iterative design process,

Figure 6-1 below illustrates this process whereby the emerging design for the Proposed Development has been tested using the transport models as part of the iteration. The transport models provided an understanding of the benefits and impacts of the proposals (mode share changes, traffic redistribution, bus performance etc.) with traffic flow information also informing other environmental disciplines (such as Air Quality, Noise and Vibration, Climate etc.) which in turn allowed feedback of potential impacts into the design process to allow for changes and in turn mitigation to be embedded in the designs. The design process included physical changes and adjustments to traffic signals including changes to staging, phasing and green times to limit traffic displacement to the greatest extent possible as well as traffic management arrangements and/or turn bans where appropriate. This ensured that any displaced traffic was kept to a

minimum and was maintained on higher capacity roads, whilst continuing to meet Proposed Development objectives along the Proposed Development.

The iterative process concluded when the design team were satisfied that the Proposed Development met its required objectives (maximising the people movement capacity of the Proposed Development) and that the environmental impacts and level of residual impacts were reduced to a minimum whilst ensuring the Proposed Development objectives remained satisfied.

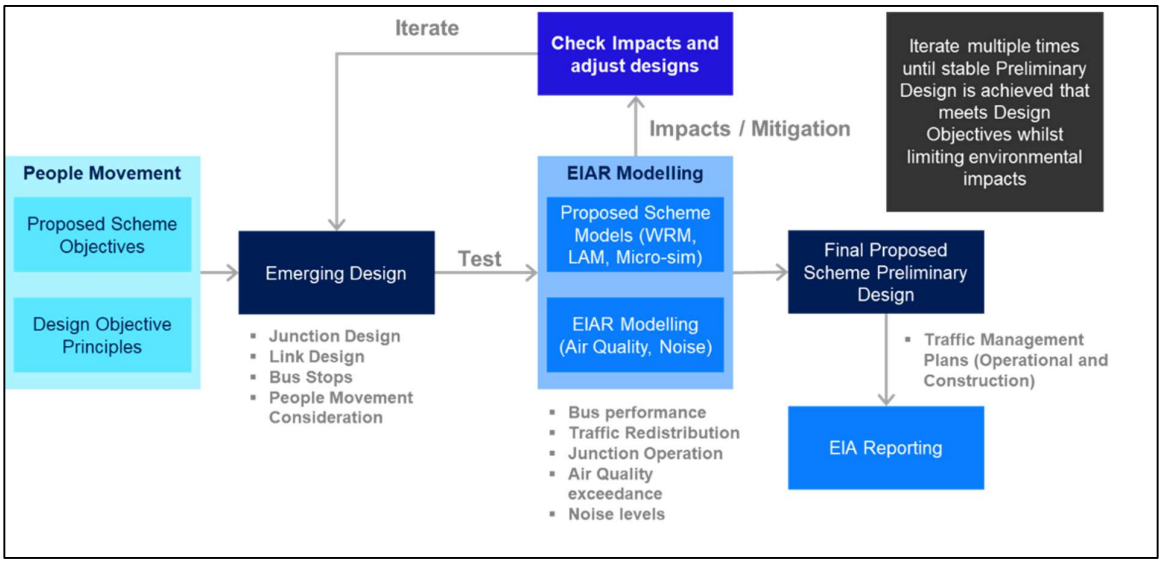

Figure 6-1: Proposed Development Impact Assessment and Design Interaction

The impacts presented in this chapter are based on the final Preliminary Design for the Proposed Development which includes the embedded mitigation developed as part of the iterative design process described above.

6.2 Guidelines

This chapter outlines the relevant transport guidelines applicable to the Proposed Development. Alignment of the Proposed Development with current guidance at all levels is an important determining factor in planning decisions. The following sections demonstrate that the Proposed Development has this alignment and thus is compliant with transport and planning guidance.

Details of the national, regional and local transport policy application to the Proposed Development are outlined in Chapter 2 (Need for the Proposed Development).

6.2.1 Traffic and Transport Assessment Guidelines

To determine the traffic and transport impact that the Proposed Development has in terms of an increase in general traffic flows on the direct and indirect study areas, a robust assessment has been undertaken, with reference to Transport Infrastructure Ireland's (TII) most recent Traffic and Transport Assessment Guidelines (TII 2014).

This document is considered best practice guidance for the assessment of transport impacts related to changes in traffic flows due to Proposed Developments and is an appropriate means of assessing the impact of general traffic trip redistribution on the surrounding road network.

According to Section 1.3 of the Traffic and Transport Assessment Guidelines (TII 2014):

'a Traffic and Transport Assessment is a comprehensive review of all the potential transport impacts of a proposed development or re-development, with an agreed plan to mitigate any adverse consequences'.

The guidelines aim to provide a framework to promote an integrated approach to development, ensuring that proposals promote more efficient use of investment in transportation infrastructure which reduces travel demand and promotes road safety and sustainable travel. The document is considered best practice guidance for the assessment of transport impacts related to changes in traffic flows due to Proposed Developments and is generally an appropriate means of assessing the traffic and transport impact of additional trips on the surrounding road network.

The Traffic Impact Assessment (TIA), in section 6.5.8 of this EIAR Chapter, follows the Traffic and Transport Assessment Guidelines and offers an impartial description of the likely impacts of the Proposed Development, outlining both its positive and negative aspects.

6.2.2 Design Manual for Urban Roads and Streets

The Design Manual for Urban Roads and Streets (DMURS) promotes an integrated street design approach within urban areas (i.e. cities, towns, and villages) focused on:

- Influence by the type of place in which the street is located; and
- Balancing the needs of all users.

A further aim of this Manual is to put well designed streets at the heart of sustainable communities to promote access by walking, cycling and public transport.

The principles, approaches and standards set out in this Manual apply to the design of all urban roads and streets (with a speed limit of 60 km/h or less), except: (a) Motorways (b) In exceptional circumstances, certain urban roads and streets with the written consent of Sanctioning Authorities.

The Manual is underpinned by a holistic design-led approach, predicated on a collaborative and consultative design process. There is specific recognition of the importance to create secure and connected places that work for all, characterised by creating new and existing streets as attractive places with high priority afforded to pedestrians and cyclists while balancing the need for appropriate vehicular access and movement.

To achieve a more place-based/integrated approach to road and street design, the following four core principles are promoted within the manual:

- Connected Networks - To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and with emphasis on more sustainable forms of transport;
- Multi-Functional Streets - The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment;
- Pedestrian Focus - The quality of the street is measured by the quality of the environment for the user hierarchy pedestrians considered first;
- Multi-disciplinary Approach - Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design; and
- The Proposed Development has been designed and assessed with reference to these guidelines.

6.2.3 Traffic Signs Manual (Chapter 8: Temporary Traffic Measures and Signs for Roadworks)

The Traffic Signs Manual (as updated) (DTTS, 2019) (Traffic Signs Manual) promotes safety, health and welfare for road workers and users. The manual details the traffic signs which may be used on roads in Ireland, including sign layout, sign symbols, the circumstances in which they are required, and the associated rules for positioning them.

Of direct relevance to the assessment of traffic and transport impacts, Chapter 7 - Road Markings outlines the function of road markings, the legalities of road markings and the application of road markings on roads

in Ireland. Chapter 8 - Temporary Traffic Measures and Signs for Roadworks outlines the application of temporary traffic management (TTM) at work sites on public roads; this chapter offers instructions and guidance to road users in relation to the use of TTM and outlines the signs to be used at roadworks.

6.2.4 Traffic Management Guidelines

The Traffic Management Guidelines (DOT, 2019) provides guidance on a number of issues including, but not limited to, traffic planning, traffic calming and management, incorporation of speed restraint measures and the provision of suitably designed facilities for public transport users and vulnerable road users.

A core component of the Guidelines is rooted in decision making and balancing priorities, including those that are in conflict with one another. The Guidelines identifies common objectives to be addressed when managing the transport network:

- Environmental improvement;
- Congestion relief;
- Capacity improvement;
- Safety;
- Accessibility;
- Economic vitality; and
- Politics.

The Proposed Development has been designed and assessed with reference to these guidelines. In addition to the above key guidelines, the Proposed Development has been designed and assessed with reference to a set of policy and guidance documents outlined in Section 6.7 of this Chapter.

6.3 Methodology

The methodology for the traffic and transport related impacts of the Proposed Development has incorporated a number of key references and inter-related stages, which have been outlined in the following Sections.

6.3.1 Study Area

The direct and indirect impacts have been considered with reference to the following study area extents, as shown in Figure 6-2:

- Direct Study Area – The Proposed Development; and
- Indirect Study Area – This is the area of influence the Proposed Development has on changing traffic volumes above a defined threshold with reference to TII's Traffic and Transport Assessment Guidelines (2014).

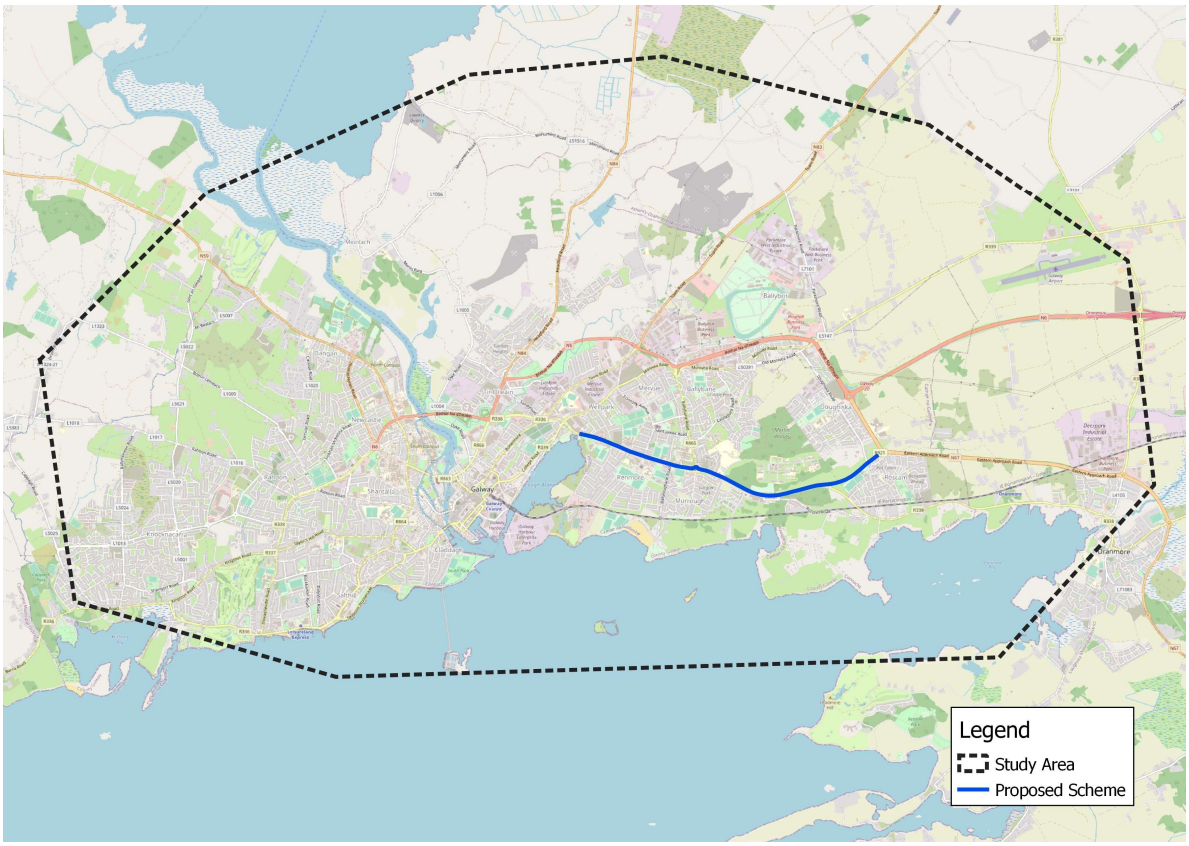

Figure 6-2: Study Area

6.3.2 Proposed Development Impact Assessment Modelling Tool

This section summarises the various transport modelling tools that have been developed and used to inform the preparation of this chapter of the EIAR. The purpose of each tool has been detailed and its use for each element of the Proposed Development has been defined.

The modelling tools that have been developed do not work in isolation but instead work as a combined modelling system driven by the NTA's Western Regional Model (WRM) as the primary source for multi-model demand and trip growth. Demand information is then passed to the cordoned Local Area Model (LAM) and a micro-simulation model which have been refined and calibrated to represent local conditions to a greater level of detail than that contained in the WRM.

In summary, there are three tiers of transport modelling which have been used to assess the Proposed Development, see Figure 6-3.

- **Tier 1 (Strategic Level):** The NTA's Western Regional Model (WRM) is the primary tool which has been used to undertake the strategic modelling of the Proposed Development and has provided the strategic multi-modal demand outputs for the proposed forecast years;
- **Tier 2 (Local Level)**: The LAM has been developed to provide a more detailed understanding of traffic movement at a local level. The LAM is a subset model created from the WRM and is a more refined road network model used to provide consistent road-based outputs to inform this chapter;
  This includes information such as road network speed data, traffic redistribution impacts the Operational Phase. The LAM also provides traffic flow information for the micro-simulation model; and
- **Tier 3 (Corridor Level)**: A micro-simulation model of the full 'end to end' corridor has been developed for the Proposed Development. The primary role of the micro-simulation model has been to support the

ongoing development of junction designs and traffic signal control strategies and to provide bus journey time information for reporting purposes.

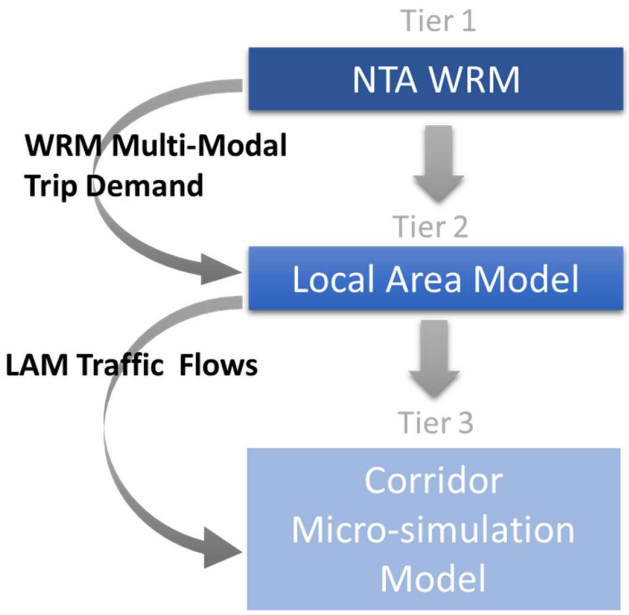

Figure 6-3: Proposed Development Modelling Hierarchy

Further detail on the transport model development process, the traffic data inputs used, the calibration, validation and forecast model development for the suite of transport models can be found in Volume 4 - Appendix 6.1 (Transport Modelling Report) of this EIAR, which accompanies this document.

6.3.3 Appraisal Method for the Assessment of Impacts

6.3.3.1 Overview

This section details the methodologies that have been used to assess the potential traffic and transport impacts of the Proposed Development during both the Construction and Operational Phases. The assessments have been carried out as follows:

- Outlining the Assessment Topics;
- Determining the Predicted Magnitude of Impacts;
- Defining the Sensitivity of the Environment; and
- Determining the Significance of Effects.

The above approach has been carried out in accordance with procedures described in the Environmental Protection Agency's (EPA) guidance on the information to be contained in EIARs (EPA 2022) and methodologies outlined in the 'Traffic and Transport Assessment Guidelines (TII 2014), using a Multi-Modal Level of Service (LoS) approach.

6.3.3.2 Outlining Transport and Traffic Assessment

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

The qualitative assessments:

- **Pedestrian Infrastructure**: The changes to the quality of the pedestrian infrastructure as a result of the Proposed Development;

- **Cycling Infrastructure**: The changes to the quality of the cycling infrastructure as a result of the Proposed Development;
- **Bus Infrastructure**: The changes to the quality of the bus infrastructure as a result of the Proposed Development; and
- **Parking / Loading**: The changes to the availability of parking and loading as a result of the Proposed Development.

The quantitative assessments, which have been undertaken using the Proposed Development modelling tools described previously:

- **People Movement**: An assessment has been carried out to determine the potential impact that the Proposed Development will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the Proposed Development 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 Development; and
- **General Traffic**: The direct and indirect impacts on general traffic using the Proposed Development and surrounding road network.

6.3.3.3 Determining the Predicted Magnitude of Impacts

The methodology used for determining the predicted magnitude of impacts has considered the traffic and transport conditions of the environment before and after the Proposed Development is in place.

The impact assessments have been carried out using the following scenarios:

- **'Do Nothing'** - The 'Do Nothing' scenario represents the current baseline traffic and transport conditions study area without the Proposed Development in place and without other GTS projects, outlined in Section 6.2. This scenario forms the reference case by which to compare the Proposed Development ('Do Something') for the qualitative assessments only;
- **'Do Minimum'** - The 'Do Minimum' scenario (Opening Year 2028, Design Year 2043) represents the likely traffic and transport conditions of the study area, including for any transportation schemes which have taken place, been approved or are planned for implementation as part of the GTS, without the Proposed Development in place. This scenario forms the reference case by which to compare the Proposed Development ('Do Something') for the quantitative assessments; and
- **'Do Something'** – The 'Do Something' scenario represents the likely traffic and transport conditions of the study area including for any transportation schemes which have taken place, been approved or are planned for implementation, with the Proposed Development in place (i.e. the Do Minimum scenario with the addition of the Proposed Development). The Do Something scenario has been broken into two phases:

    - Construction Phase (Construction Year 2026) – This phase represents the single worst-case period which will occur during the construction of the Proposed Development;
    - Operational Phase (Opening Year 2028, Design Year 2043) – This phase represents when the Proposed Development is fully operational.
    - Opening Year assessment is based on the same network as the base year plus other committed schemes;
    - Design year assessment is based in the context of the full implementation of the GTS network re-design (including the Galway City Ring Road) in both the Do Minimum and Do Something scenarios, with the Proposed Development servicing the new GTS services.

The changes between the Do Minimum and Do Something scenarios have been presented in either a positive, negative or neutral Quality of Impact as a result of the Proposed Development, depending on the assessment topic. A high, medium, low or negligible rating has been applied to each impact assessment to determine the Magnitude of Impact.

6.3.3.3.1 Level of Service Impact Assessment

To outline the changes in conditions between the Do Minimum and Do Something scenarios a Level of Service (LoS) approach has been developed for the impact assessments, where appropriate. This concept allows a straightforward comparison of two differing scenarios using a series of metrics specifically developed for this purpose.

The concept of LoS was originally developed in the United States' Transportation Research Board's (TRB) Highway Capacity Manual (HCM, 7th edition 2022). Under this concept, potential values for a performance measure are divided into six ranges, with each range assigned a letter grade ranging from "A" (highest quality) to "F" (lowest quality). LoS concepts are applied universally throughout the world, and have their basis in Highway Capacity Manual and, particularly for bus network assessments, in the Transit Capacity and Quality of Service Manual (TRB, 3rd edition 2013).

LoS concepts are not target based or rigid in their application and bespoke versions are developed to suit the particular receiving environment of the Proposed Development under consideration or the particular user problems that the Proposed Development and/or project is seeking to address. A mix of quantitative and qualitative indicators can be used and summarised as a LoS. The process enables integrated planning and decision making across all modes rather than any specific mode which can create a bias in the assessment process (e.g. focusing on Car Volume over Capacity (V/C)). It is intended that the LoS framework for the Proposed Development will provide an easily understandable summary of the impact of each assessment topic, where applied.

6.3.3.4 Defining the Sensitivity of the Environment

The impact assessment sensitivities established for the Traffic and Transport Chapter have been informed using the following data sources:

- OpenStreet / Google Maps - to identify community facilities, and open spaces within 50m of the Proposed Development; and
- The LAM (NavStreets) and Google Traffic data – to identify the capability of roads to cater for traffic volumes and existing congested junctions / road links.

The content of Table 6-3 outlines the sets of sensitivity ratings that have been applied to the impact assessments, depending on whether the assessment location is directly within the corridor, or indirectly associated with the corridor.

Table 6-3: Traffic & Transport Sensitivities

Assessment Area	Sensitivity			
	High	Medium	Low	Negligible
Proposed Development / Direct Study Area Sensitivities	Sections of the Proposed Development that are in the vicinity of community facilities such as schools or colleges, neighbourhood centres; AND currently experiencing congestion for pedestrians, cyclists, buses or general traffic	Sections of the Proposed Development that currently experience congestion for pedestrians, cyclists, buses or general traffic that have not been identified as high sensitivity	Sections of the Proposed Development near public open space, nature conservation areas, residential areas that have not been identified as medium or high sensitivity	Areas of low sensitivity to traffic flows i.e. isolated sites or areas with a high standard road network

Assessment Area	Sensitivity			
Indirect Study Area Sensitivities	Category 5: Low capacity, low operating speeds. Local and minor roads.	Category 4: High capacity, moderate operating speeds. Roads connecting between neighbourhoods.	Category 3 roads: High capacity, high operating speeds (less than Category 2). Roads connecting Category 2 roads.	Category 1: High capacity, high operating speeds. Roads connecting between major cities or urban areas.

6.3.3.5 Determining the Significance of Effects

The Significance of Effects rating has been established using Table 6-4 which was derived from Diagram 3.5 of the EPA Guidelines on EIARs. This enables the sensitivities and magnitudes of impact to determine the significance of a particular effect. For example, a section of a Proposed Development with a High sensitivity and a Long-term, Medium, Positive impact would have a potential 'Positive, Very Significant and Permanent' effect. A section of a Proposed Development with a low sensitivity and a short-term low negative impact would have a potential 'Negative, Slight and Temporary' effect.

Table 6-4: Significance of Effects Matrix for Traffic and Transport Chapter

Description Impact	Sensitivity of Existing Environment			
	High	Medium	Low	Negligible
High	Profound	Very Significant	Moderate	Slight
Medium	Very Significant	Significant	Moderate	Not Significant
Low	Moderate	Moderate	Slight	Not Significant
Negligible	Not Significant	Not Significant	Not Significant	Imperceptible

The definitions for the Significance of Effects ratings for the Proposed Development ranging from Imperceptible to Profound are outlined in Table 6-5.

Table 6-5: EIAR Impact Significances

Significance of Effects (EPA)	Typical Criteria Descriptors
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics

Potential mitigation and monitoring measures have been considered for assessments that result in a negative effect and significant or higher (i.e. significant, very significant or profound).

6.3.4 Data Collection and Collation

The assessment of the Traffic & Transport impacts of the Proposed Development has two distinct parts namely, qualitative methods which consider the physical changes to transport networks and quantitative methods which are based upon traffic modelling. The following sections describe the data collection and collation for each method of assessment.

6.3.4.1 Qualitative Assessment Data Collection

6.3.4.1.1 Site Surveys

A walkover of the route of the Proposed Development was undertaken and photographs were used to record locations of particular importance. This ensures an up-to-date record of the existing environment was used to complete the qualitative assessment. The surveys focussed on the following aspects which are relevant to the assessment:

- Provision for the movement of pedestrians, cyclists and vehicles;
- Location of, and facilities at, bus stops; and
- Existing parking and loading facilities.

These surveys were supplemented by specially commissioned aerial orthophotography along the full length of the Proposed Development.

6.3.4.1.2 Mapping Data

Two sources of mapping data have been used to inform the analysis, NavStreets and OpenStreet Map.

NavStreets is a street-level GIS dataset which covers the Republic of Ireland, including the Proposed Development area. Two sets of data from this dataset have been used to inform the EIAR:

- Road Network: Functional Class of each road link in the road network, which is a road type indicator, reflecting traffic speed and volume, as well as the importance and connectivity of the road. The Functional Class information has been used to help inform the metrics for identifying the sensitivities of roads in the indirect study area; and
- Points of Interest: NavStreets contains information on a wide range of “points of Interest”. This has been referred to when identifying sensitive community receptors, such as schools, healthcare facilities, places of worship, retail clusters, etc, when determining how sensitive a particular location is to changes in terms of traffic and transport facilities.

OSM and NavStreets have been supplemented by OpenStreet Map which is an open-source database of geographic data (i.e. Points of Interest, Land Use and Places of Worship). This has been used to further identify community facilities and open spaces in proximity to the Proposed Development.

6.3.4.2 Quantitative Assessment Data Collection

This section discusses the data collection undertaken to inform the quantitative assessment metrics set out in 6.3.3.4. Further detail can be found in Volume 4 - Appendix 6.1 (Transport Modelling Report) of this EIAR.

6.3.4.2.1 Commissioned Traffic Survey Data

A comprehensive set of traffic count surveys were undertaken for a neutral period in November 2022 when schools, colleges were in session. TII have a permanent traffic counter on the N6, within the Galway city, which gives an idea of traffic levels 365 days of the year, for several years. The Average Annual Daily Traffic (AADT) level for this location in 2022, was 21,451 vehicles. The AADT estimate for 2024 (up to the end of October 2024) is 22,922. This suggests the traffic levels haven’t changed in the time passed, (an approximate 6% increase) and thus the Traffic Impact Assessment is still based on relevant, up to date, data.

6.3.4.2.2 Junction Turning Counts (JTCs)

The JTCs are 24-hour counts broken down into 15-minute segments over a full day. All main junctions along the Proposed Development have been included and provide information on the volume, and types of vehicles, making turning movements at each location. This data is utilised within the models to ensure that the flow of vehicles through the main junctions on the network is being represented accurately. In total, 122 JTCs were collected and used for this study. The location of these are shown in the figure below.

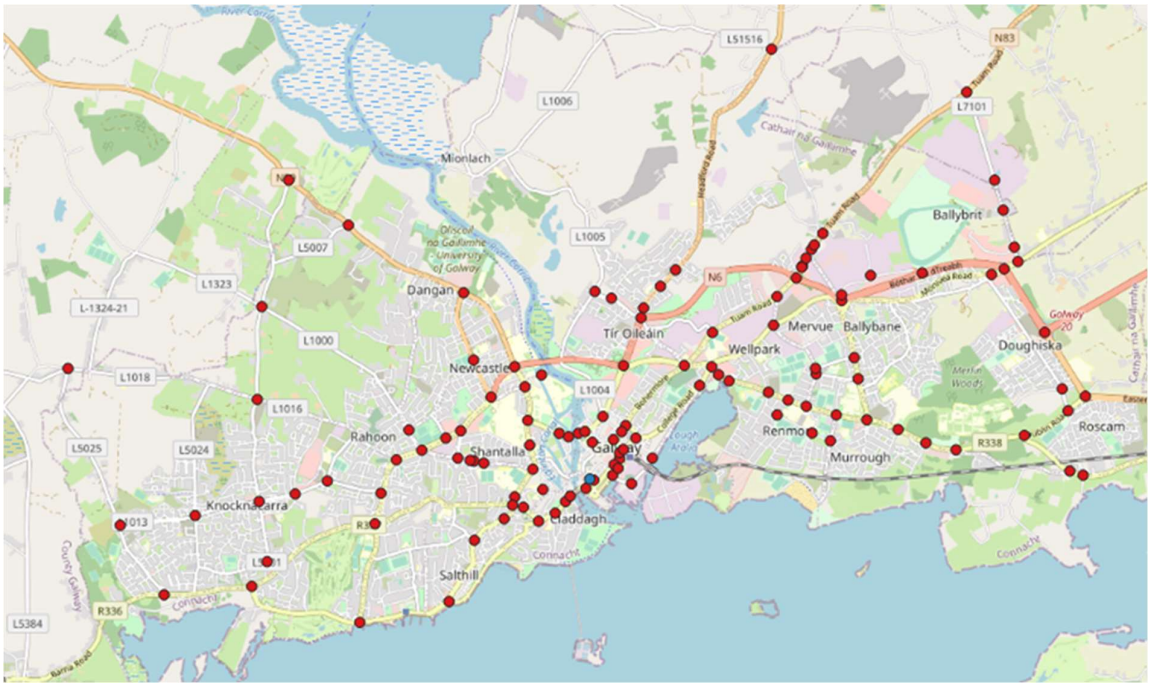

Figure 6-4:Locations of JTCs counts used in study

6.3.4.2.3 Automatic Traffic Counts (ATCs)

The ATC data provides information on:

- The daily and weekly profile of traffic along the Proposed Development; and
- Busiest time periods and locations of highest traffic demand on the network.

25 ATC locations were surveyed for an entire week (5th to 11th of November). The figure below shows the locations of these ATCs. A full summary of the collected data can be found in Volume 4 - Appendix 6.1 (Transport Modelling Report) of this EIAR.

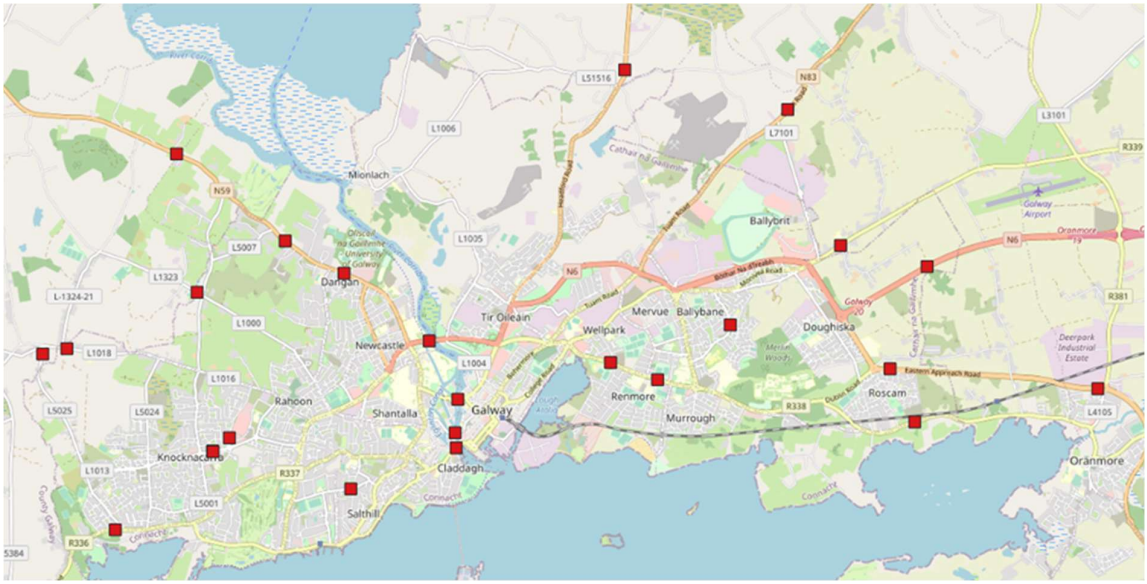

Figure 6-5:Locations of ATCs counts used in study

6.3.4.2.4 Road and Bus Journey Time Data

Bus Journey Time Data

Bus Journey time data for the Proposed Development was provided by the National Transport Authority (NTA) from the Automatic Vehicle Location (AVL) dataset used to monitor bus performance. The data provides information on bus travel time and dwell times at existing bus stops and has been used to inform the development of the transport models used to assess the impacts of the Proposed Development. The data relates to the entire month of November 2022.

TomTom Road Journey Time Data

Road Journey time data for the Proposed Development models has been sourced from "Tom Tom – Traffic Solutions", who calculate journey times using vehicle position data from GPS-enabled devices and provide this on a commercial basis to a number of different users. The NTA purchased a license to access the anonymised Custom Area Analysis dataset through the TomTom TrafficStats portal. The NTA has an agreement with TomTom to provide travel time information covering six areas of Ireland and for certain categories of road.

The data is provided in the form of a GIS shapefile and accompanying travel time database file. The shapefile contains topographical details for each road segment, which is linked to the travel time database via a unique link ID. The database file then contains average and median travel time, average and median speed, the standard deviation for speed, the number of observations and percentile speeds ranging from 5 to 95 for each link.

TomTom Data Processing

In order to compare the journey times of specific links and routes between the TomTom data and the road assignment models, the two datasets were linked. After importing both the road assignment model and TomTom networks into the GIS environment, ensuring both datasets are in the same coordinate system, the selected routes were then linked using a spatial join functionality.

Before applying the data to the models, it was checked to ensure that it was fit for purpose. The review included checks of the number of observations that form the TomTom average and median times and checks of travel times against Google Maps travel times.

The TomTom Custom Area Analysis dataset was processed to provide observed journey times against which the strategic and micro-simulation models could be validated along the Proposed Development route.

TomTom Data Application

The processed journey time data was used to validate the LAM and the micro-simulation models at an end-to-end travel time level, with intermediate segment travel times used to inform the calibration of both models. Further information about the journey time validation process can be found in Volume 4 - Appendix 6.1 (Transport Modelling Report) of this EIAR.

6.4 Baseline Environment

6.4.1 Overview

This section provides an overview of the existing traffic and transport conditions in the area surrounding the Proposed Development and is informed by desk-based research. These baseline conditions have been identified so the context of the Proposed Development and its potential impacts on the local highway and transport network can be fully understood.

In describing the baseline conditions, the Proposed Development has been divided into 2 sections, outlined in Figure 6-6 below. The extent of each section is described below:

- Section 1: East of Moneenageisha Junction to Skerritt Junction; and
- Section 2: Skerritt Junction to Doughiska Junction

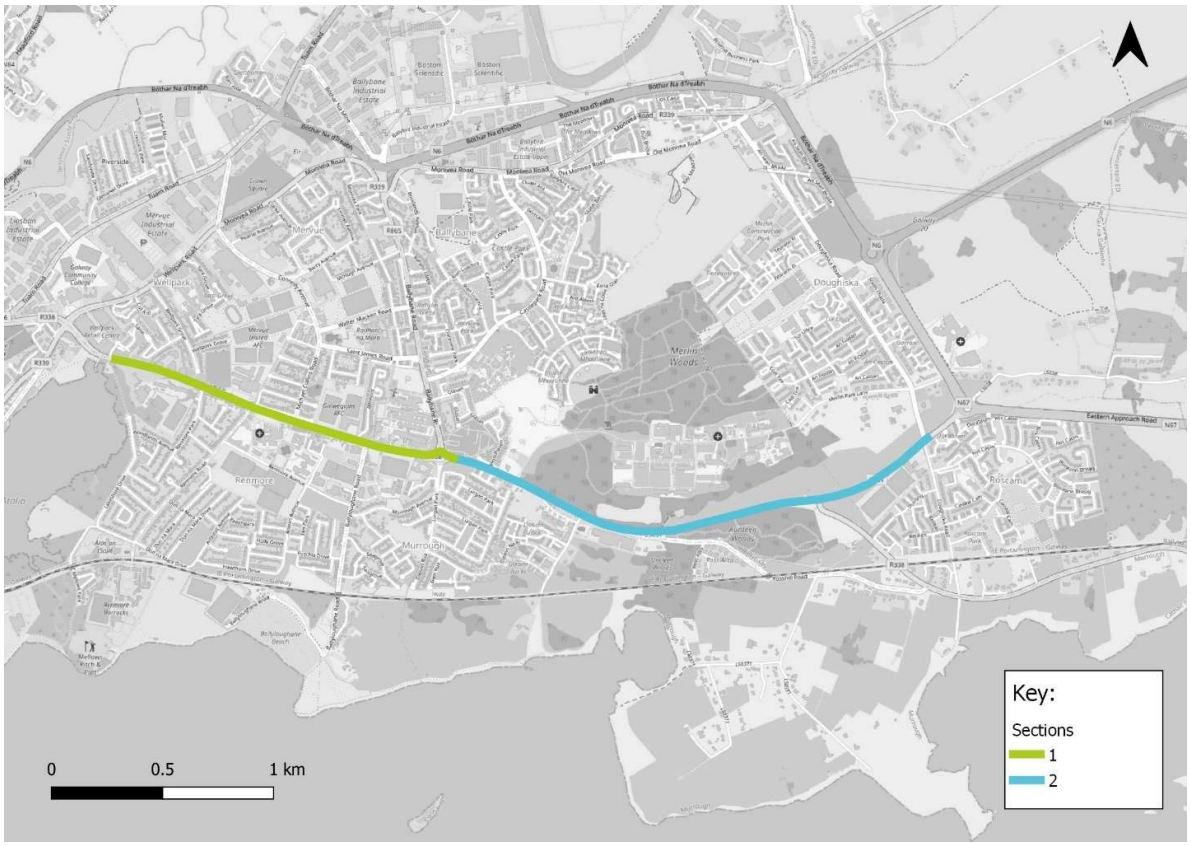

Figure 6-6:Sections of Proposed Development

6.4.1.1 Mode Share

The existing average mode share across a 24hr period for the Galway City and Oranmore area is shown in Figure 6-7 below. This data has been extracted from the WRM model, for the year 2022.

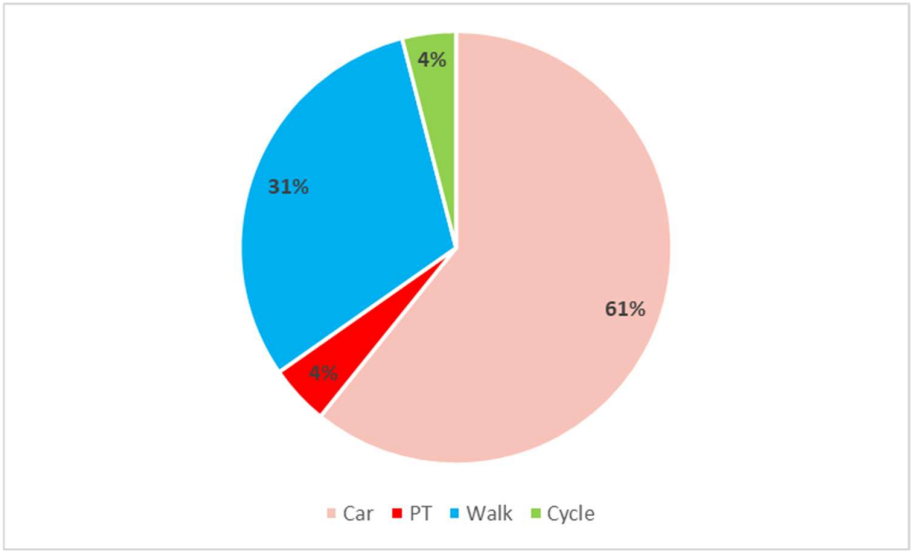

Figure 6-7: Existing Mode Share

The diagram demonstrates that car is the most common form of transport at 61% of the mode share. Walking is the second most common form of transport at 31%. While cyclists and public transport (PT) each make up 4% of the total mode share.

6.4.1.2 Existing Junction Capacity

The average capacity at key junctions during the AM peak is shown in Figure 6-8 below. The diagrams only show junctions operating with above an 85% volume over capacity (V/C) ratio. A V/C ratio above 85% suggests that a junction is approaching theoretical capacity and may experience occasional queues and delays within the hour.

Figure 6-8: Junction Capacity AM Peak

Figure 6-8 demonstrates that, in total, eight junctions are currently operating over theoretical capacity during the AM Peak Hour (>100% V/C ratio). 26 junctions are operating with a V/C ratio of between 85% and 100%.

The average capacity at key junctions during the PM peak is shown in Figure 6-9 below.

Figure 6-9: Junction Capacity PM Peak

Figure 6-9 demonstrates that a total 12 junctions are currently operating over theoretical capacity during the PM Peak Hour (>100% V/C ratio). 19 junctions are operating between 85% and 100% theoretical capacity.

6.4.1.3 Automatic Vehicle Location Journey Times

Automatic Vehicle Location (AVL) systems are required for service control of buses, communications with drivers, and the current generation of real-time information for on-street displays, websites, and mobile apps. The information recorded by AVL is also central to the tracking of operational performance by following metrics on routes such as punctuality (journey times) and stops serviced. Therefore, by taking a sample of this AVL dataset, a picture can be formed of the average journey times for various services including their reliability.

A sample was taken for a bus route in the month of November in 2022 between two stops which correspond to the start and end points of the Proposed Development.

The data was analysed for the average weekday in November 2022 for both inbound and outbound services and a profile across the 6:00 – 24:00 period was generated. Table 6-6 and Figure 6-10 show the journey times in the inbound direction.

Table 6-6: AVL Journey Time Data – Average Weekday (Inbound Services)

Time	Average Planned Running Time (min)	Average Actual Running Time (min)	25% of Buses reaching the 2nd stop within this time	75% of Buses reaching the 2nd stop within this time	95% of Buses reaching the 2nd stop within this time
05:30	8	7	6	8	9
06:00	8	9	8	9	10
06:30	9	8	7	10	11

Time	Average Planned Running Time (min)	Average Actual Running Time (min)	25% of Buses reaching the 2nd stop within this time	75% of Buses reaching the 2nd stop within this time	95% of Buses reaching the 2nd stop within this time
07:00	10	9	8	11	12
07:30	10	11	9	13	15
08:00	12	13	9	16	18
08:30	13	13	9	16	18
09:00	11	11	9	13	14
09:30	10	10	8	12	14
10:00	9	11	8	13	15
10:30	9	11	8	13	15
11:00	9	10	9	12	13
11:30	9	11	9	14	15
12:00	11	11	9	13	14
12:30	11	13	0	26	35
13:00	11	11	8	14	16
13:30	11	11	8	14	16
14:00	11	11	9	14	15
14:30	11	11	9	13	15
15:00	11	11	9	13	15
15:30	11	11	5	17	22
16:00	11	11	9	13	15
16:30	12	11	9	13	15
17:00	11	11	9	14	15
17:30	11	10	8	12	14
18:00	11	10	8	11	13
18:30	10	10	8	12	13
19:00	9	9	7	11	12
19:30	9	10	8	11	13
20:00	9	11	-4	25	35
20:30	9	9	7	11	12
21:00	8	9	5	12	15
21:30	8	8	7	10	11
22:00	8	8	4	12	14
22:30	8	7	6	9	10
23:00	7	7	3	11	14
23:30	7	6	5	7	8
24:00	7	6	5	7	8

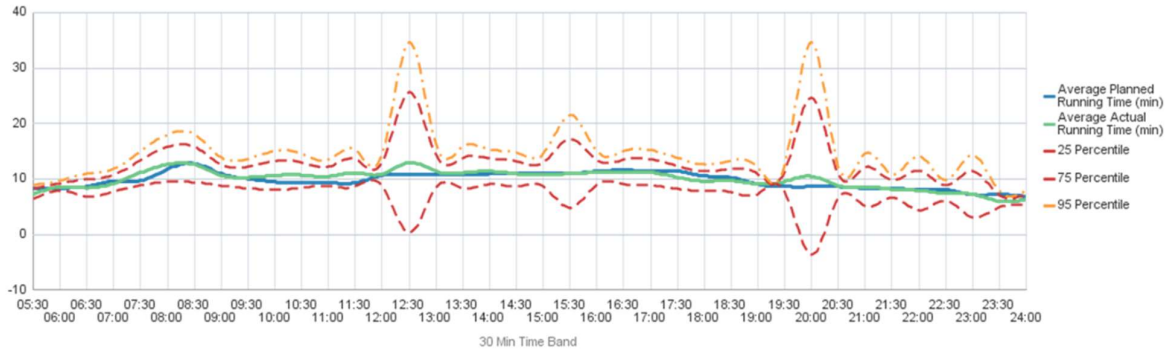

Figure 6-10: Average Weekday Bus Journey Time Profile (Inbound Services)

For the inbound services, the AVL data shows that overall actual journey times are close to the planned ones, with some degree of variability occurring around 12:30. and 20:00.

Table 6-7 and Figure 6-11 show the journey times in the outbound direction.

Table 6-7: AVL Journey Time Data – Average Weekday (Outbound Services)

Time	Average Planned Running Time (min)	Average Actual Running Time (min)	25% of Buses reaching the 2nd stop within this time	75% of Buses reaching the 2nd stop within this time	95% of Buses reaching the 2nd stop within this time
06:00	7	7	6	9	10
06:30	7	7	6	9	10
07:00	9	8	6	10	11
07:30	9	9	7	10	11
08:00	9	11	8	14	16
08:30	10	12	7	17	20
09:00	9	8	7	10	11
09:30	8	8	7	10	11
10:00	8	8	6	10	11
10:30	8	9	6	12	14
11:00	9	9	7	11	12
11:30	9	9	7	11	13
12:00	9	10	7	12	14
12:30	9	10	7	13	15
13:00	11	10	8	13	15
13:30	11	11	8	14	16
14:00	11	11	8	14	16
14:30	11	12	9	16	18
15:00	13	12	9	15	17
15:30	13	13	8	18	22
16:00	13	15	9	20	24

Time	Average Planned Running Time (min)	Average Actual Running Time (min)	25% of Buses reaching the 2nd stop within this time	75% of Buses reaching the 2nd stop within this time	95% of Buses reaching the 2nd stop within this time
16:30	15	16	10	23	27
17:00	15	14	9	18	22
17:30	14	12	9	15	17
18:00	12	10	8	12	14
18:30	10	9	8	10	11
19:00	8	9	7	10	11
19:30	8	8	7	10	11
20:00	8	9	3	16	20
20:30	8	8	7	9	10
21:00	8	8	6	9	10
21:30	8	8	5	11	13
22:00	7	8	7	9	9
22:30	7	8	4	11	13
23:00	7	7	6	8	9
23:30	7	7	6	8	9

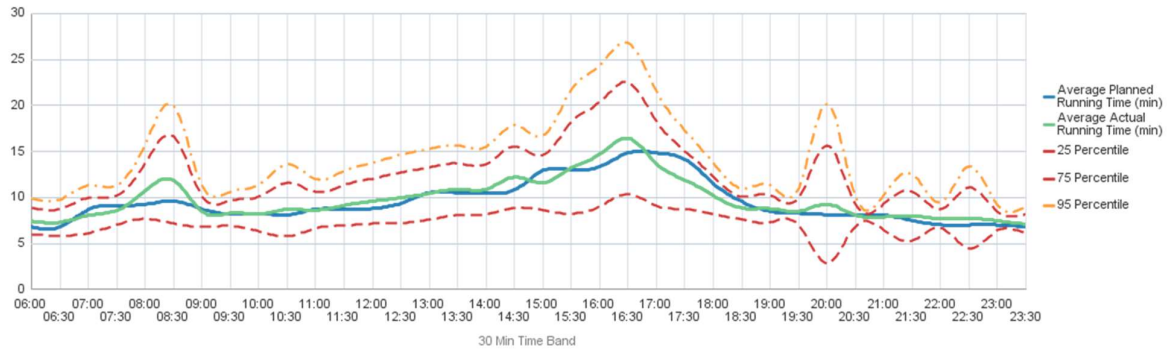

Figure 6-11: Average Weekday Bus Journey Time Profile (Outbound Services)

For the outbound services, the AVL data shows a moderate degree of variability in journey times during the morning peak and from midday onwards with the peak occurring around 16:30.

6.4.2 Section 1 – Dublin Road / Wellpark Road to Skerritt Roundabout

This Section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 1 of the Proposed Development, between Wellpark Road and Skerritt Roundabout.

6.4.2.1 Pedestrian Infrastructure

There are footpaths along both sides of the road throughout Section 1 of the Proposed Development. The footpaths are all a minimum of 1.8m wide. No streetlighting is present on the eastbound side of the road until the Dublin Road/ Woodlands Campus (Rosedale & Lakeview School) junction approximately 550 metres to the east by Wellpark Road.

There are several controlled pedestrian crossings along Section 1 which benefit from tactile paving and dropped kerbs. Controlled crossings can be found at the following locations:

- Signalised pedestrian crossing on Dublin Road, approximately 60m east of the Dublin Road/ Woodlands Campus junction;
- Signalised pedestrian crossings on all three arms of the Dublin Road / Renmore Road junction;
- Signalised pedestrian crossings on all four arms of the Dublin Road / Michael Collins Road/ Galway Hospice junction; and
- A signalised pedestrian crossing on western arm of Dublin Road of the Dublin Road/ Ballyloughane Road junction.

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs and tactile paving.

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at the junctions along Section 1 of the Proposed Development are included in Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR.

6.4.2.2 Cycling Infrastructure

There is limited cycle infrastructure along Section 1 of the Proposed Development. Cyclists are expected to share the traffic lanes in both directions, aside from a short eastbound cycle lane approximately 58 metres in length and 2.5m in width to the west of the Dublin Road / Renmore Road Junction. Cyclists have priority at the advanced stop line at the Michael Collins Road junction.

Currently there are 23 stands for TFI cycle hire, around the city.

6.4.2.3 Bus Infrastructure

6.4.2.3.1 Bus Priority Measures

There is a significant level of bus priority in place for eastbound traffic on Section 1, with approximately 765 metres of the route comprising a bus priority lane. Additionally, there is a bus lane for westbound traffic on Section 1, approximately 521 metres in length between the Renmore Road/ Dublin Road junction and to the west of Skerritt roundabout.

6.4.2.3.2 Bus Stop Facilities

There are currently eight bus stops along Section 1 of the Proposed Development. The eastbound bus stops on Dublin Road are as follows:

- Stop 522701 approximately 39 metres to the west of the Renmore Park junction - shelter with timetable information;
- Stop 524131 approximately 84 metres to the east of the Renmore Road junction – provides a shelter with timetable information;
- Stop 524141 approximately 32 metres to the west of the Belmont junction – provides a shelter with timetable information; and
- Stop 522811 approximately 83 metres to the west of the Skerritt Roundabout - shelter with timetable info and real time information.

The westbound bus stops on Dublin Road are as follows:

- Stop 522961 approximately 170 metres to the west of the Renmore Park junction - shelter with timetable info and real time information;
- Stop 524351 approximately 83 metres to the west of the Michael Collins Road junction – provides a shelter with timetable information;
- Stop 524341 approximately 39 metres to the west of the Ballyoughane Road junction - Bus flag and pole with timetable information; and

- Stop 522811 approximately 112 metres to the west of the Skerritt Roundabout - shelter with timetable info and real time information.

The main bus services which operate along Section 1 are outlined in Table 6-8.

Table 6-8: Section 1 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
51	Galway - Renmore - Gort - Shannon - Bruree - Mallow - Cork	1 hr	1 hr
52	Galway - Renmore - Balla - Castlebar - Foxford - Ballina	2.5 - 3 hours	2.5 - 3 hours
251	Galway – Renmore – Limerick - Cork	2-3 hours	3 hours
251X	Galway – Renomore – Cork	3 services	No services
350	Galway – Kinvarra – Craggagh – Doolin – Inagh – Ennis	1-3 hours	2-3 hours
64	Galway – Knock – Luga – Sligo – Bundoran – Letterkenny - Derry	4 services	4 services
402	Renmore - Galway - Shantalla - Knocknacarra	30 mins	30 mins
404	Ballybrit - Doughiska - Renmore - Galway - Eyre Square	10 mins	30 mins
409	Galway – Wellpark- Doughiska - Ballybrit	10 mins	10 mins
430	Galway – Tuam – Ballindine – Castlebar – Foxford - Ballina	2.5 – 3 hours	2.5 – 3 hours
434	Galway – Adrahan - Galway	1 service	NA
706	Galway – Renmore – Athlone – Maynooth - Dublin	4 services	4 services
706X	Galway – Renmore – Athlone – Dublin	4 services	4 services
763	Galway – Loughrea – Athlone – Kinnegad – Lucan – Dublin	2 hours	2 hours
844	Galway – Renmore – Loughrea – Portumna – Birr	30 mins	2 services
920	Loughrea – Craughwell – Galway – Shantella	1 hour	1 hour

6.4.2.4 General Traffic

Dublin Road (R338 from Wellpark Road to Skerrit Roundabout) comprises a single carriageway with one lane for westbound traffic and two lanes for eastbound traffic, including one bus lane for eastbound traffic until the Renmore Road junction. Between the Renmore Road junction and Skerritt Roundabout, Dublin Road comprises a single carriageway with one lane for eastbound traffic and two lanes for westbound traffic, one of which is a bus lane.

The existing major junction arrangements along this section are as follows:

Dublin Road/ Renmore Park Priority Junction: Dublin Road/Renmore Park is a three-arm priority junction. Renmore Park has one entry lane and one exit lane. Dublin Road has one entry lane for eastbound traffic and one entry lane for westbound traffic. A bus lane is also present for eastbound traffic. A bus stop for eastbound traffic is located approximately 30m west of the junction. A pedestrian crossing is located 60 west of the junction.

Dublin Road/ Renmore Road Signalised Junction: Dublin Road/Renmore Road is a three-arm signalised junction. Renmore Road has one entry lane and one exit lane. Dublin Road has two entry lanes for eastbound traffic, and one entry lane for westbound traffic. A bus stop for eastbound traffic is located approximately 75 metres to the east of the junction. A minor 58m cycle lane is located to the west of the junction.

Dublin Road/ Michael Collins Road Signalised Junction: Dublin Road/Michael Collins Road is a four-arm signalised junction. Michael Collins Road has two entry lanes and one exit lane. Dublin Road has two entry lanes for the eastbound movement, one for right-turning movement and one for a straight ahead and left turning movement. Dublin Road has three entry lanes for the westbound movement, one for right-turning movement and one for a straight ahead and one for a left turning movement formed of traffic merging with the bus lane. Galway Hospice forms the southern arm of the junction and has one entry lane and one exit lane. A bus stop for eastbound traffic is located approximately 45 metres to the west of the junction. Advanced stop lines for cyclists are present on the north, east and southern arms of the junction. A cycle hire facility with 14 stands is located approximately 35 metres to the east of the junction.

Dublin Road/ Galwegians RFC Priority Junction: Dublin Road/Galwegians RFC is a three-arm priority junction. Galwegians RFC has one entry lane and one exit lane. Dublin Road has one entry lane for eastbound traffic, and one entry lane for westbound traffic. A bus lane is also present for westbound traffic. A bus stop for eastbound traffic is located approximately 70 metres to the east of the junction.

Dublin Road/ Belmont Priority Junction: Dublin Road / Belmont is a three-arm priority junction. Dublin Road comprises one entry lane for eastbound traffic, and one entry for westbound traffic. A bus lane is also present for westbound traffic. Belmont is comprised of one entry and one exit lane. The Dublin Road / Belmont junction is located approximately 15 metres to the west of the Dublin Road / Ballyloughane Road signalised junction. A bus stop for eastbound traffic is located approximately three metres to the west of the junction.

Dublin Road / Ballyloughane Road Signalised Junction: Dublin Road / Ballyloughane Road is a three arm signalised junction, with signals on the western arm only. Ballyloughane Road has two entry lanes and one exit lane. Dublin Road has two entry lanes westbound traffic including traffic merging from a bus only lane, and one entry lane for eastbound traffic. There is no right turn available to Ballyloughane Road from Dublin Road. A bus stop for eastbound traffic is located approximately 42 metres to the west of the junction.

Skerritt Roundabout: Skerritt Roundabout is a four-arm priority roundabout. Each arm is comprised of two entry lanes and one exit lane, aside from the northern arm which in addition to two entry lanes has two exit lanes, one northbound and one for the eastbound turn into the Misneach development. Unsignalised crossings are provided at each arm with dropped kerbs and tactile paving. A bus stop for westbound traffic is provided approximately 50 metres to the west of the roundabout.

6.4.2.5 Parking & Loading Facilities

The private parking facilities along Section 1 impacted by the Proposed Development are outlined below.

There are 15 paid/commercial private parking spaces at the Dublin Road/ Woodlands Campus (Brothers of Charity Services) There are 18 commercial private parking spaces adjacent to the Dublin Road/ Renmore Road junction at the Duggan's Spar. Further to this, there is a bus set down parking area on Dublin Road approximately 150m east of the Dublin Road / Ballyloughane Road junction which is opposite the ATU campus.

6.4.3 Section 2 –Skerritt Roundabout – R338 Dublin Road/Doughiska Road

This Section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 2 of the Proposed Development, along Dublin Road, between Skerritt Roundabout and the R338 Dublin Road/Doughiska Road junction.

6.4.3.1 Pedestrian Infrastructure

There are footpaths and street lighting along both sides of the road throughout Section 2 of the Proposed Development. The footpaths are all a minimum of 2.0m wide and are continuous on both sides of the road.

Signal Controlled pedestrian crossings in Section 2 of the Proposed Development that benefit from tactile paving and dropped kerbs are located:

- on all three arms of the Galway Crystal junction which links to Lios an Uisce and Gleann na Ri residential areas;
- on the western arm of the Dublin Road/ Coast Road junction; and
- on all three arms (norther, southern and eastern of the Dublin Road/Doughiska Road junction.

All other crossings at priority junctions along minor roads benefit from dropped kerbs and tactile paving.

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at the junction are included in Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR.

6.4.3.2 Cycle Infrastructure

There is limited cycle infrastructure along Section 2 of the Proposed Development. Cyclists are expected to share the lane with traffic in both directions.

6.4.3.3 Bus Infrastructure

6.4.3.3.1 Bus Priority Measures

For westbound traffic, there is a continuous bus lane running between Martin Roundabout and Skerrit Roundabout.

6.4.3.3.2 Bus Stop Facilities

There are currently six bus stops along Section 2 of the Proposed Development. The eastbound bus stops are as follows:

- Stop 524151 approximately 110m to the east of Murrough Drive junction - Bus shelter with no timetable information;
- Stop 524171 approximately 110m to the west of Coast Road junction - Bus Pole only; and
- Stop 524181 approximately 45m to the west of the Doughiska Road junction - Bus pole only.

The westbound stops are as follows:

- Stop 522831 approximately 11m to the south of the Woodhaven junction - Bus shelter and timetable information;
- Stop 524331 approximately 43m to the west of Murrough Drive junction - Bus shelter and timetable information; and
- Stop 524321 approximately 50m to the west of Doughiska Road junction - Bus shelter with timetable information and live updates.

The main bus services which operate along Section 2 are outlined in Table 6-9: below.

Table 6-9: Section 2 Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
402	Renmore – Galway - Shantella	30 mins	30 mins
404	Ballybrit - Doughiska - Renmore - Galway - Eyre Square	10 mins	30 mins
409	Galway - Wellpark - Doughiska - Ballybrit	10 mins	10 mins
844	Galway - Renmore - Loughrea -Portnumna - Birr	30 mins	2 services
GM08	Westport - Renmore - Galway - Shantalla	N/A	1 service on Sunday
NG11	Ballinfoyle - Galway - Renmore - Ballina - Bangor Erris - Belmullet	N/A	1 service on Sunday

6.4.3.4 General Traffic

Dublin Road (R338 from Skerrit Roundabout to Martin Roundabout) comprises a single carriageway with two lanes for westbound traffic, including one bus lane for the entirety of the section, and one lane for eastbound traffic.

Dublin Road / Woodhaven: Dublin Road/Woodhaven is a three-arm priority junction. Woodhaven has one entry lane and one exit lane. Dublin Road has one entry lane for eastbound traffic, and one entry lane for westbound traffic. A bus lane is also present for westbound traffic. A bus stop for westbound traffic is located immediately to the south of the junction. An unsignalised pedestrian crossing is located across the northern arm of Woodhaven.

Dublin Road / Merlin Meadows: Dublin Road/Merlin Meadows is a three-arm priority junction. Merlin Meadows has two entry lanes, and one exit lane. Dublin Road has one entry lane for eastbound traffic, and two entry lanes for westbound traffic, including one short lane for right-turning traffic into Merlin Meadows. A bus lane is also present for westbound traffic.

Dublin Road / Murrough Drive: Dublin Road/Murrough Drive is a three-arm signalised junction. Murrough Drive has two entry lanes and one exit lane. Dublin Road has two entry lanes for eastbound traffic, and two entry lanes for westbound traffic, one which is merged traffic from a bus only lane. A bus stop for westbound traffic is located approximately 40 metres to the west of the junction. Signalised pedestrian crossings are located across all three arms of the junction. Advanced stop lines for cyclists are present on the south and east arms of the junction.

Dublin Road / Rosshill Road: Dublin Road / Rosshill Road is a three-arm priority junction. Rosshill Road has one entry lane and one exit lane. Dublin Road has two entry lanes for eastbound traffic and two entry lanes for westbound traffic, one which is merged traffic from a bus only lane. A bus stop for eastbound traffic is located approximately 240 metres to the west of the junction.

Dublin Road / Coast Road: Dublin Road / Coast Road is a three-arm signalised junction, with a pedestrian crossing located on Coast Road only. Coast Road has two entry lanes, with one for a right and one for a left turn, and one exit lane. Dublin Road comprises of two entry lanes both eastbound and two entry lanes for westbound traffic, one which is merged traffic from a bus only lane. A bus stop for eastbound traffic is located approximately 72 metres to the west of the junction. Advanced stop lines for cyclists are present on all arms of the junction.

Dublin Road / Doughiska Road: Dublin Road / Doughiska Road is a four-arm signalised junction. Doughiska Road north and south have two entry lanes, and one exit lane. Dublin Road has three entry lanes both eastbound traffic and westbound traffic. Pedestrian crossings are located on the northern, southern and eastern arms. The northern arm of Doughiska Road contains segregated cycle lanes on both sides of the road, approximately 33 metres to the north of the junction.

6.4.3.5 Parking & Loading Facilities

There is no parking or loading facilities along Section 2 of the Proposed Development, nor in its surrounding area.

6.5 Potential Impacts

This section presents potential impacts that may occur due to the Proposed Development, in the absence of mitigation. This informs the need for mitigation or monitoring to be proposed.

6.5.1 Characteristics of the Proposed Development

The characteristics of the Proposed Development are described in detail in Chapter 4 (Proposed Development Description).

6.5.2 Do Nothing Scenario

With regards to this chapter, the 'Do Nothing' scenario means there would be no changes to existing transport infrastructure, so infrastructure provision for buses, pedestrians and cyclists would remain the same. The streetscape would continue to be based around the movement and parking requirements of private cars instead of people. High levels of traffic are associated with discouraging pedestrian and cyclist activity and this activity would be further discouraged as traffic congestion remains the same or increases. The baseline situation of congestion and journey time reliability issues for buses would also continue, and potentially be exacerbated over time as traffic congestion increases in line with travel demand growth.

6.5.3 Do Minimum Scenario

The 'Do Minimum' scenario represents the likely traffic and transport conditions of the direct and indirect study areas **without** the Proposed Development in place. This scenario forms the reference case by which to compare the Proposed Development ('objective'). The opening year for the Proposed Development is assumed to be 2028, with a design assessment year (opening + 15 years) assumed to be 2043.

For the qualitative analysis the assessment is in relation to the conditions of the existing transport network, which have been outlined in Section 6.4 (Baseline Environment) corresponding with a 'Do Nothing' scenario. For the quantitative analysis (i.e. the transport modelling elements of the impact assessment), the 'Do Minimum' scenario is based on the 'likely' conditions of the transport network and include for any known permanent improvements or changes to the road or public transport network that have taken place, been approved or are planned for implementation. The transport schemes and demand assumptions within the Do Minimum scenario are detailed below.

6.5.3.1 Do Minimum Transport Schemes

The full list of schemes in relation to the Do Minimum scenario can be found in Volume 4 - Appendix 6.1 (Transport Modelling Report) of this EIAR. The Do Minimum network is defined for 2028 and 2043.

The transport demand changes for the 2028 and 2043 year have been included within this chapter, using travel demand forecasting from the WRM. This accounts for planned growth contained with the NPF. The NPF recognises that Galway, as one of Ireland's five biggest cities, will play an important role in driving the economy. The projected population growth within Galway City and its suburbs is expected to grow by 50-60% by 2040, or up to a total of 120,000 individuals.

6.5.4 Do Something Scenario

The Do Something scenario represents the likely conditions of the direct and indirect study area with the Proposed Development in place. The traffic and transport elements of the Proposed Development are presented in detail in Chapter 4 (Proposed Development Description) of the EIAR.

6.5.4.1 Forecast Mode Shares

Considering the Galway City and Oranmore area, the predicted morning peak hour (AM) and evening peak hour (PM) mode share in the Do Minimum compared to the Do Something 2028 and 2043 scenarios can be seen in Figure 6-12 and Figure 6-13 respectively. In 2028, car usage is forecasted to show a marginal reduction, declining from 52.7% in the 'Do Minimum' scenario to 52.4% in the 'Do Something' scenario. This coincided with a corresponding increase in public transport mode share, rising from 13.5% to 13.8%. A similar trend was observed in 2043 for the AM peak, with car mode share decreasing from 48.0% in the 'Do Minimum' scenario to 47.5% in the 'Do Something' scenario, along with an increase in public transport mode share from 15.4% to 15.8%.

Likewise, during the PM peak in 2028, private car usage is forecasted to show a slight decline from 57.4% in the 'Do Minimum' scenario to 57.1% in the 'Do Something' scenario, accompanied by a corresponding increase in public transport mode share, which rose from 11.1% to 11.4%. This pattern persists in the 2043 PM peak, with car mode share reducing from 53.3% in the 'Do Minimum' scenario to 53.0% in the 'Do Something' scenario, and public transport mode share increasing from 11.9% to 12.4%.

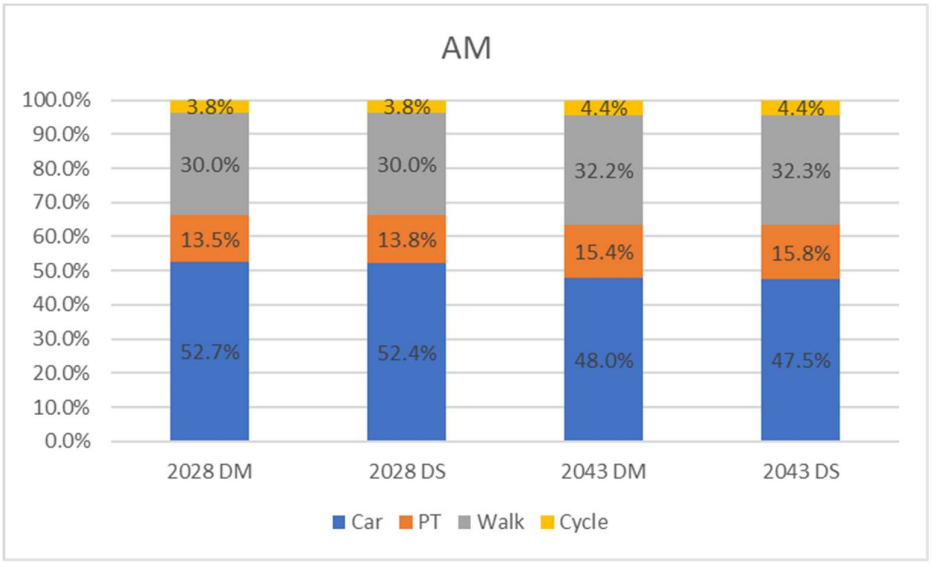

Figure 6-12: AM mode shares within Galway City & Oranmore

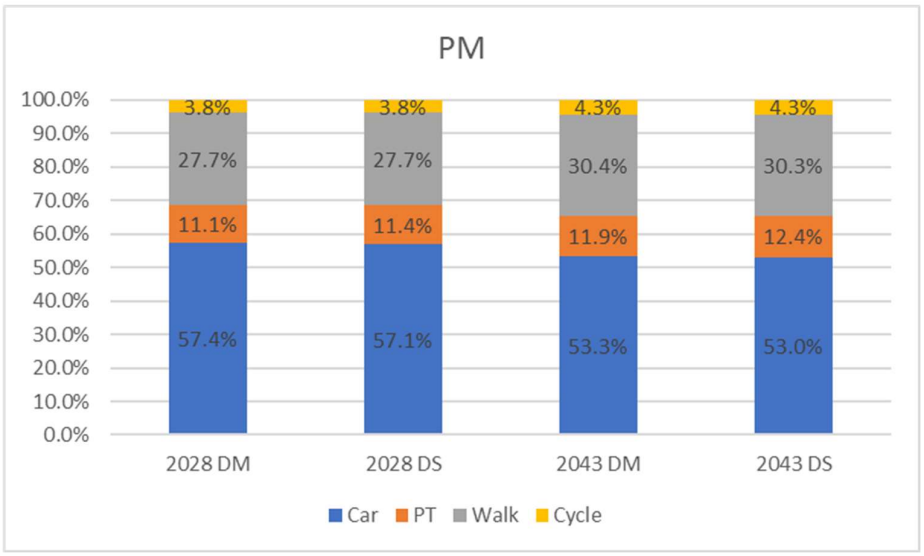

Figure 6-13: PM mode shares within Galway City & Oranmore

6.5.5 Construction Phase

This section considers the potential temporary traffic and transport impacts that construction of the Proposed Development will have on the direct and indirect study areas during the construction phase.

Chapter 5 (Construction) of the EIAR has been prepared to demonstrate the likely approach that will be taken to construct the Proposed Development. A high-level construction strategy has been prepared which provides an overview of the construction activities necessary to undertake the works, including information on a proposed Construction Compound, construction plant and equipment. This assessment, as outlined herein, provides an overview of the potential traffic and transport impacts of the Construction Phase based on the information in this strategy.

A Construction Environmental Management Plan (CEMP) has been prepared and is included as Appendix A5.1 in Volume 4 of this EIAR. The CEMP which will be updated and finalised by the appointed contractor

prior to construction commencing. The CEMP comprises the construction mitigation measures, which are set out in this EIAR, and will be updated with any additional measures which may be required by the conditions attached to An Bord Pleanála's decision. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum during the Construction Phase. 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, 5th Edition (CIRIA, 2023).

All of the content provided in the CEMP will be implemented in full by the appointed contractor and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in this EIAR.

Furthermore, the appointed contractor will be required to prepare and implement a comprehensive Construction Traffic Management Plan (CTMP). In preparing the CTMP for the proposed works, the appointed contractor will be required to give consideration where practicable to facilitate and identify opportunities for the maximum movement of people during the construction period through implementing the following hierarchy of transport mode users:

- Pedestrians;
- Cyclists;
- Public Transport; and
- General Traffic.

Access will be maintained for emergency vehicles along the Proposed Development, throughout the Construction Phase.

6.5.5.1 Description of Construction Works

The Proposed Development has been divided into the following three principal sections;

- **Section 1:** East of Moneenageisha Junction to Skerritt Junction;
- **Isolated Section:** Skerritt Junction; and
- **Section 2:** Skerritt Junction to Doughiska Road Junction.

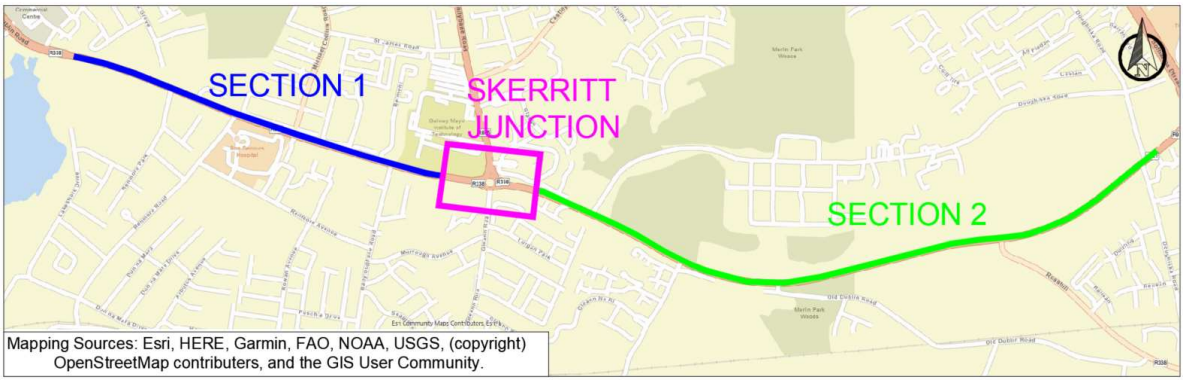

Figure 6-14: Construction Phasing

6.5.6 Construction Programme

It is expected that construction will commence in 2026, with construction works anticipated to take approximately 24 months, which could be potentially reduced with additional resources. Individual activities will have varying durations. In order to achieve the overall programme duration, working on more than one section/sub-section at any one time will be necessary. The programme has been prepared with a view to providing as much separation as practicable between sections at any given time, in order to minimise traffic

disruption and facilitate the ease of movement of sustainable modes, bus services and goods along the Proposed Development. Table 6-10 shows the estimated programme for the Proposed Development.

Table 6-10:Proposed Development Construction Programme

Section Reference	Duration (Months)	Month																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Section 1	13																								
Skerritt Junction	6																								
Section 2	11																								

6.5.6.1 Construction Route

The appointed contractor's CTMP shall include measures for managing traffic in and out of the construction compounds. Construction vehicles will be directed to access work sections via the Proposed Development and dedicated routes on the National and Regional Road Network where practicable, to minimise use of the local road network. The following national roads are expected to be used as construction vehicle access routes during the Construction Phase of the Proposed Development:

- N6;
- N59;
- N83; and
- N84.

The following regional roads are expected to be used as construction vehicle access routes during the Construction Phase of the Proposed Development:

- R336;
- R338;
- R446; and
- R865.

Potential construction vehicle access routes for the Proposed Development are shown in Figure 6-15**.**

Figure 6-15: National Roads Used for Construction

6.5.6.2 Potential Construction Impact

6.5.6.2.1 Overview

Construction of the Proposed Development has the potential to impact people's day-to-day activities along the corridor while the works are underway. Chapter 5 (Construction) of this EIAR identifies impactful activities, considers their effect, and identifies mitigation measures to reduce or remove their impact insofar as practicably possible.

For the majority of the works associated with the Proposed Development, it is envisaged that normal working hours will be followed. In specific circumstances, such as road crossings or road resurfacing, the works will be carried out at night.

For construction activities on or adjacent to public roads, all works will be undertaken in accordance with DOT's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks' and associated guidance. Chapter 5 (Construction) of the EIAR contains temporary traffic management proposals for the Proposed Development. These proposals maintain safe distances between road users and road workers, depending on the type of construction activities taking place and existing site constraints. Temporary diversions, and in some instances temporary road closures, may be required where a safe distance cannot be maintained to undertake works necessary to complete the Proposed Development. All road closures and diversions will be determined by Galway City Council. The need for temporary access restrictions will be confirmed with residents and businesses prior to their implementation.

6.5.6.2.2 Pedestrian and Cyclist Provisions

As described in Chapter 5 (Construction) of the EIAR, pedestrians will be temporarily impacted by construction activities along the Proposed Development The measures set out in Section 8.2.8 of the Traffic Signs Manual will be implemented, wherever practicable, to ensure the safety of all road users, in particular pedestrians (including able-bodied pedestrians, wheel-chair users, mobility impaired pedestrians, pushchair users) and cyclists. Therefore, where footpaths or cycle tracks are affected by construction, a safe route will be provided past the work area, and where practicable, provisions for matching existing facilities for pedestrians and cyclists will be made.

6.5.6.2.3 Public Transport Provisions

Existing public transport routes and bus stops (where possible, providing temporary facilities maybe required in agreement with bus providers) will be maintained throughout the duration of the Construction Phase of the Proposed Development (notwithstanding potential for occasional road closures / diversions noted in the Chapter 5 and in Table 6-11 below). Wherever practicable, bus services will be prioritised over general traffic. However, the temporary closure of sections of existing dedicated bus lanes will be required to facilitate the construction of new bus priority infrastructure that is being developed as part of the Proposed Development. Some existing bus stop locations will need to be temporarily relocated to accommodate the works. In such cases, bus stops will be safely accessible to all users and all temporary impacts on bus services will be determined in consultation with GCC and the service providers.

6.5.6.2.4 Parking and Access

When roads and streets are being upgraded, there will be some temporary disruption / alterations to on street and off-street parking provision, and access to premises in certain locations along the Proposed Development. Local arrangements will be made on a case-by-case basis to maintain continued access to homes and businesses affected by the works, at all times, where practicable. Details regarding temporary access provisions will be discussed with homes and businesses prior to construction starting in the area. The duration of the works will vary from property to property, but access and egress will be maintained at all times, except for short durations to facilitate tie ins of services and road alignments.

6.5.6.2.5 General Traffic

The roads and streets along the Proposed Development, will remain open to general traffic wherever practicable during the Construction Phase; however, lane closures, road closures and diversions will be necessary to facilitate construction of the works.

These measures will be minimised wherever possible, they are likely to be short lived and only required for limited activities. Where necessary, road closures and diversions will take into consideration the impact on road users, residents, businesses, etc. Road closures and diversions will be carried out with regard to the Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks). All road closures and diversions will be determined by Galway City Council, in consultation with An Garda Síochána, as necessary. Access will be maintained for emergency vehicles along the Proposed Development, throughout the Construction Phase.

Table 6-11: Road Closures, Lane Closures and Diversions

Section Ref.	Estimated Construction Duration	Traffic Management Provision
Section 1	13	- One lane of traffic in each direction will be maintained along the Dublin Road - Phased lane closures as required (i.e. lane narrowing or realignment of lanes) to facilitate the works.
Skerritt Junction	6	- Phased lane closures as required, such as lane narrowing or single lane closure, to facilitate the works (i.e. demolition of central island of roundabout and traffic islands, utilities / cable duct laying works, installation of kerb / tracks, etc.).
Section 2	11	- One lane of traffic in each direction will be maintained along the Dublin Road - Phased lane closures as required (i.e. lane narrowing or realignment of lanes) to facilitate the works.

Two-way traffic will generally be maintained along the Proposed Development, however in circumstances where there is not sufficient road width to allow two-way traffic (e.g. reduced lane width), single lane traffic controlled by a stop / go system of temporary traffic lights will be implemented with priority provided to traffic travelling towards the City Centre during the morning and reversed during the afternoon where appropriate. Lane closures and route diversions will supplement this system if traffic volumes are heavy. Delays may occur outside of the AM and PM peaks, for example as a result of vehicles accessing the works.

For most of the Proposed Development the existing carriageway width is sufficient to maintain full width two-way traffic throughout the works. However, where the carriageway width is restricted, at various sections throughout the Proposed Development the construction works will be split into traffic management stages as described below.

The existing carriageway layout will be maintained along the Proposed Development to facilitate existing traffic flows, where practicable, however at active construction works areas, the carriageway layout will be modified to provide sufficient space for construction works to be undertaken. The active construction works areas will be dictated by the construction programme. The traffic will be split into three traffic management stages (Stage A to Stage C) to facilitate the works.

Stage A: Traffic management will be implemented by means of narrowing the existing lanes and carrying public transport and general traffic to 3.0m.

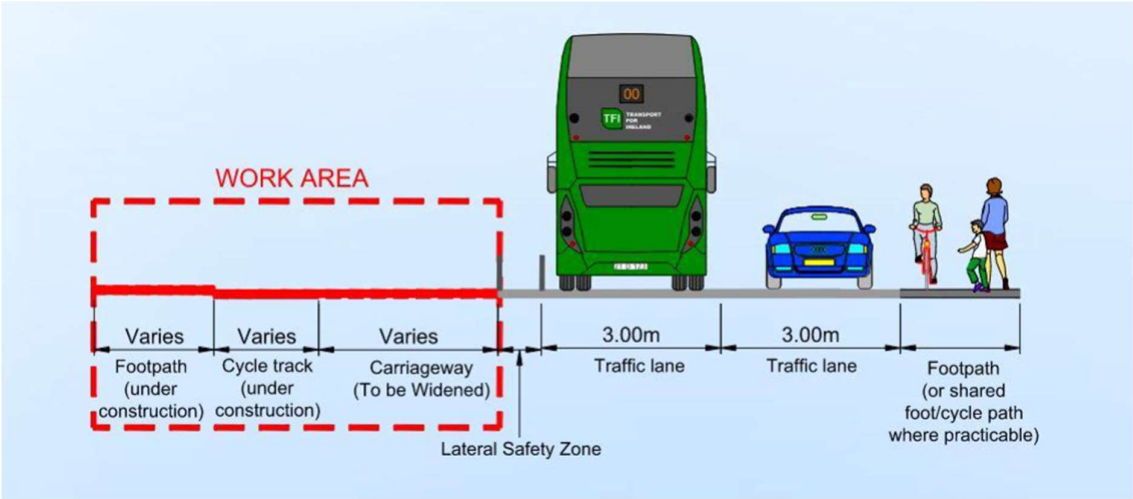

Figure 6-16: Work Area – Stage A

Stage B: Public transport, general traffic, pedestrians, and cyclists will be transferred to the opposite side of the carriageway to facilitate Stage B works. This stage will include the same methodology as outlined in Stage A.

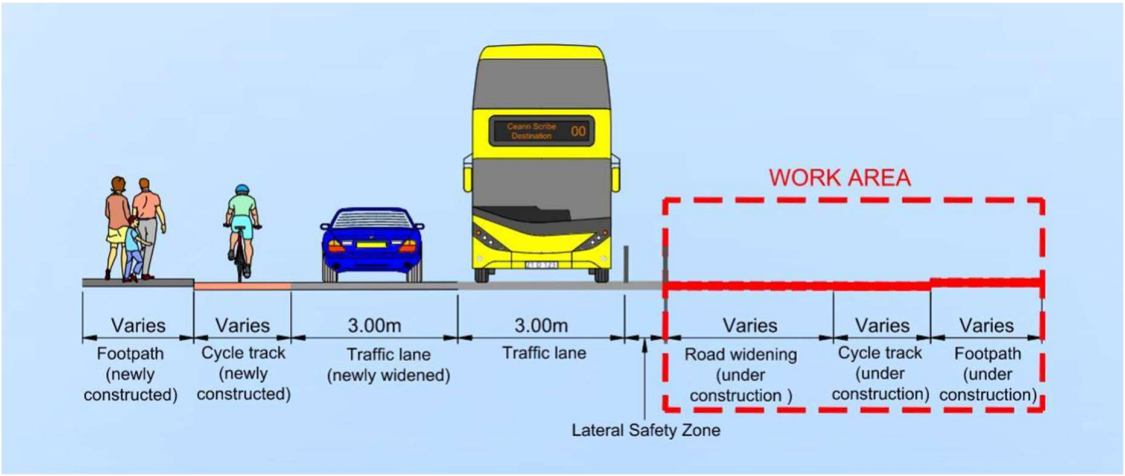

Figure 6-17: Work Area – Stage B

Stage C: Stage C will entail completion of the proposed final road surfacing. To maintain traffic movement at this stage, lane closures, road closures, or diversions will be implemented, as appropriate.

6.5.6.2.6 Construction Traffic Generation

Traffic will be generated during the Construction Phase of the Proposed Development. Construction traffic can be expected to comprise of trips for the following purposes:

- Journeys by construction personnel to and from the Proposed Development;
- Delivery and removal of materials to and from the Proposed Development:
  - Clearance of existing material and waste;
  - Deliveries of construction material; and
  - Removal of construction waste material.

In order to assess a reasonable worst-case Construction Phase impact scenario, an estimate of construction plant and equipment that will be necessary to construct the Proposed Development has been prepared. The

estimated peak daily numbers of principal items of plant and equipment working within a section is indicated in Table 6-12. It should be noted that these are peak daily numbers.

Table 6-12: Estimated Peak Daily Plant and Equipment Numbers

Plant/Equipment	Section 1	Skerritt Junction	Section 2
Lorry	6	3	6
Backhoe Mounted Hydraulic Breaker	2	1	2
8t Excavator	2	1	2
13t (Rubber Wheeled) Excavator	1	1	1
16t (Rubber Wheeled) Excavator	2	1	2
6t Dumper	2	2	2
Road Planer	1	1	1
Road Sweeper	1	1	1
Asphalt Paver	1	1	1
Asphalt Roller	1	1	1
3t Roller	1	1	1
Mini Digger	2	1	2
Vibratory Roller	1	1	1
Total	**23**	**16**	**23**

Construction vehicle movements will be managed during the periods of 07:00 to 09:00 and 17:00 to 19:00 weekdays to minimise the impact of construction related traffic on peak-hour general traffic.

Night-time, Saturday and Sunday working will be required during certain periods to minimise the impact on road traffic movements during the daytime, for example at busy road junctions and in commercial areas, and for such works as pavement / road surfacing. The planning of such works will take consideration of sensitive receptors, in particular any nearby residential areas.

6.5.6.2.7 Site Operatives

It is anticipated that there will be a construction workforce of approximately 50 personnel directly employed across the Proposed Development, rising to 70 personnel at peak construction. In addition, it is anticipated that there will be significant indirect employment supported by the Proposed Development, for example: in logistical support companies, material and plant suppliers, traffic management companies and in the local service industry.

The appointed contractor will prepare a Construction Stage Mobility Management Plan (CSMMP) which will be developed prior to construction to actively discourage personnel from using private vehicles to travel to site. The CSMMP will promote the use of public transport, cycling and walking by personnel. Private parking at the Construction Compound will be limited. Vehicle-sharing will be encouraged, subject to public health guidelines, where travel by private vehicle is a necessity e.g. for transporting heavy equipment. A combination of CSMMP measures, as well as work shift patterns, means that fewer than 10 trips by private vehicle are envisaged to and from site during peak periods.

Typical work hours are envisaged between 07:00 and 19:00 on weekdays (excluding Bank and Public Holidays). This includes standard delivery hours to the construction sites and a half hour to prepare site at each end (i.e. giving 11 hours working on weekdays: 07:30 to 18:30).

6.5.6.2.8 Construction Phase Summary

Given that the above impacts are minimal and comfortably below the thresholds set out in TII's Guidelines for Transport Assessments, it is considered appropriate to define the general potential traffic impacts of the Construction Phase as negligible and having a Not Significant and Temporary effect. Therefore, no further analysis is required for the purpose of this assessment.

It should be noted that further detail on the restrictions to construction vehicle movements during the peak periods of the day will be contained within the appointed contractor's CTMP prior to construction.

The contents of Table 6-13present a summary of the potential impacts of the Proposed Development during Construction Phase.

Table 6-13: Summary of Construction Phase Impacts

Assessment Topic	Description of Effect	Potential Impact / Significance of Effect
Walking	Restrictions to pedestrians along Proposed Development.	Negative, Slight and Temporary
Cycling	Restrictions to cyclists along Proposed Development	Negative, Slight and Temporary
Bus	Restrictions to public transport along Proposed Development.	Negative, Slight and Temporary
Parking and Loading	Restrictions to parking / loading along Proposed Development.	Negative, Slight and Temporary
General Traffic	Restrictions to general traffic along Proposed Development	Negative, Moderate and Temporary
Construction Traffic	Restrictions to construction traffic along Proposed Development	Negative, Slight and Temporary

6.5.7 Operational Phase

The impact assessment for the Operational Phase has been outlined in terms of a qualitative (walking, cycling, bus infrastructure and parking / loading) and quantitative (bus journey times / reliability, general traffic and people movement) impact analysis, which are outlined in the following sections.

6.5.7.1 Qualitative Assessment Methodology

The structure of the qualitative assessment is consistent with the Baseline Environment (Section 6.4) and Chapter 4 (Proposed Development Description), whereby the Proposed Development has been split into 2 sections. This has allowed for a more detailed analysis of the quality of the infrastructure proposals per section. The approach for each qualitative assessment is outlined below.

6.5.7.1.1 Pedestrian Infrastructure

The impacts to the quality of the Pedestrian Infrastructure as a result of the Proposed Development have been considered with reference to any changes to the existing pedestrian facilities along footpaths and crossing locations. Reference has been made to the overall changes along the full length of the Proposed Development and the impact assessment primarily focuses only on the pedestrian facilities at junctions to provide a direct comparison between the Do Minimum and Do Something scenarios.

Where the Proposed Development introduces a change to a junction layout, the impact on pedestrians has been assessed using a set of criteria which has been derived from guidance listed in the references section of this report (Section 6.2). The contents of Table 6-14 outline the assessment criteria for each junction.

Table 6-14: Pedestrian Junction Assessment Criteria

Aspect	Indicator
Routing	Are pedestrian crossings (signalised or uncontrolled) available on all arms?
Directness	Where crossings are available, do they offer direct movements which do not require diversions (two-stage) or staggered crossings i.e., no or little delay required for pedestrians to cross in one direct movement?
Vehicular Speeds	Are there measures in place to promote low vehicular speeds, such as minimally sized corner radii and narrow lane widths?
Accessibility	Where crossings exist, are there adequate tactile paving, dropped kerbs and road markings for pedestrians (including able-bodied, wheelchair users, mobility impaired and pushchairs)?
Widths	Are there adequate footpath and crossing widths in accordance with national standards?

The LoS rating demonstrated in Table 6-15: has been applied to each junction for both the Do Minimum and Do Something scenarios based on whether the above indicators have been met.

Table 6-15: Pedestrian Junction Assessment LoS

LoS	Indicators Met (of Total of 5)
A	5
B	4
C	3
D	2
E	1
F	0

When comparing the Do Minimum (without Proposed Development) and Do Something (with Proposed Development) pedestrian infrastructure, the terms (high, medium, low or negligible) outlined in Table 6-16: have been used to describe the impact, based on the changes in the Qualitative Pedestrian LoS rating.

Table 6-16: Description of Impact for Pedestrian Qualitative Assessment

Magnitude of Impact	Change in LoS Rating
High	3 to 4
Medium	2
Low	1
Negligible	0

To establish the Significance of Effect for the impacts of the Pedestrian Infrastructure, as a result of the Proposed Development, a sensitivity rating has been applied to each junction in accordance with the methodology set out in Section 6.3.3.

6.5.7.1.2 Cycling Infrastructure

The impacts to the quality of the cycling infrastructure as a result of the Proposed Development have been considered with reference to the changes in physical provision for cyclists provided during the Do Minimum and Do Something scenarios. The Quality of Service (QoS) evaluation criteria contained in the NTA's National Cycle Manual's (2011), has been adapted for use in assessing the cycling qualitative impact along the Proposed Development. The refined cycling facilities criteria are as follows:

- **Segregation:** a measure of the separation between vehicular traffic and cycling facilities;

- **Number of adjacent cyclists / width:** the capacity for cycling two abreast and / or overtaking ('2+1' accommodates two abreast plus one overtaking); and
- **Junction Treatment:** a measure of the treatment of cyclist traffic at existing junctions.

The contents of Table 6-17 outline the assessment criteria with reference to the corresponding LoS ratings.

Table 6-17: Cycling Assessment Criteria

LoS	Segregation	No. of adjacent cyclists/width		Junction treatment
A+	High degree of separation. Minimal delay	2+1	2.5m	Cyclists get green signal priority at signalised junctions / has priority across uncontrolled junctions
A	Well separated at mid-link with some conflict at intersections	1+1	2.0m	Toucan crossings at signalised junctions for cyclists along CBC / Protected junctions not already classified as A+ for junction treatment
B	On-road cycle lanes or carriageway designated as 'quiet cycle routes'	1+1	1.75m	Cyclists share green time with general traffic and cycle lanes continue through the junction, for junctions not already classified as A or A+ for junction treatment
C	Bicycle share traffic or bus lanes	1+0	1.25m	Cyclists share green time with general traffic with cycle facilities (advanced stacking locations / cycle lanes) available up to the junction but don't continue through
D	No specific bicycle facilities	1+0	0.75m	No specific bicycle facilities

When comparing the Do Minimum and Do Something scenarios for cyclists, the terms outlined in Table 6-18 have been used to describe the impact, based on the changes in the Qualitative Cycling LoS rating.

Table 6-18: Description of Impact for Cycling Qualitative Assessment

Magnitude of Impact	Change in LoS Rating
High	3 to 4
Medium	2
Low	1
Negligible	0

To establish the Significance of Effect for the impacts of the cycling infrastructure, as a result of the Proposed Development, a sensitivity rating has been applied to each assessed section in accordance with the methodology set out in Section 6.3.3.

6.5.7.1.3 Bus Infrastructure

The implementation of the Proposed Development will result in changes in the quality of bus infrastructure provision along the route, including dedicated bus lanes and bus stop upgrades / relocations. Improvement in bus priority measures will reduce the interaction between buses and general traffic and reduce the likelihood of delays.

The qualitative impact assessment has been undertaken based on the following factors:

- Provision of bus lanes and associated bus priority measures;
- Pedestrian Accessibility;
- Bus stop provision; and
- Changes to the existing bus stop facilities:
  - Real-time information;
  - Timetable information;
  - Shelters;
  - Seating;
  - Accessible kerbs; and
  - Removal of indented drop off areas, where appropriate.

The magnitude of impact of the Proposed Development, applied to the qualitative review of the above factors, is set out in Table 6-19

Table 6-19: Magnitude of Impact for Bus Users Qualitative Assessment

Impact	Description of Impact / Proposed Changes
High positive	Significant benefit for bus users with no disbenefits
Medium positive	Positive impact for bus stop users with benefits outweighing any minor disbenefits.
Low positive	Slight benefit for users with benefits outweighing any disbenefits.
Negligible impact	Marginal impact to user buses where any benefits or disbenefits are offset.
Low negative	Slight negative impact for users with disbenefits marginally outweighing benefits.
Medium negative	Negative impact for bus users with benefits not outweighing any disbenefits.
High negative	Complete removal of provision.

To establish the Significance of Effect for the impacts of the bus infrastructure, as a result of the Proposed Development, a sensitivity rating has been applied to each assessed section in accordance with the methodology set out in section 6.3.3.

6.5.7.1.4 Parking and Loading

The impacts of the Proposed Development on parking and loading provision have been assessed through a comparison of the availability of spaces or lengths of bay in the with and without Proposed Development scenarios. The assessment has taken the parking information and considers the impact of any changes on the general availability of parking and loading in the vicinity of the Proposed Development.

This qualitative assessment has also considered nearby parking, which is defined as alternative parking locations along side roads within 200–250m of the Proposed Development.

Significance ratings for the impacts of any changes in parking provision have been generated for each specific instance of change and for each section of the Proposed Development. The ratings are based upon professional judgement and experience and consider:

- The magnitude of change in parking availability;
- The availability of alternative parking; and
- Nearby land uses, such as businesses.

Note that the parking and loading assessment has been undertaken as a qualitative analysis based on the above criteria and does not generate a resulting LoS rating.

6.5.7.2 Section 1 – Dublin Road / Wellpark Road to Dublin Road Skerritt Roundabout

6.5.7.2.1 Pedestrian Infrastructure Changes

The key infrastructural changes to the pedestrian link along Section 1 of the Proposed Development are the following:

- Raised junction treatments added to the majority of minor arms/ accesses at unsignalised junctions, reducing vehicle speeds;
- Existing footpath widened adjacent to the Connaught Hotel access;
- Upgrade of the eastern and western pelican crossings to toucan crossings at the Dublin Road/ Renmore Road signalised junction;
- Upgrade of the eastern and western pelican crossings to toucan crossings at the Dublin Road/ Michael Collins Road signalised junction;
- Addition of a northern arm at the Dublin Road/ Ballyloughane Road signalised junction to connect to Belmont;
- Proposed toucan crossing approximately 150m west of the Skerrit Roundabout junction; and
- Upgrade of Skerritt Roundabout to a four-arm signalised junction, with signals on all arms.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 1 of the Proposed Development are summarised in Table 6-20 along with the accompanying sensitivity for each junction and the resultant significance of effect. A detailed breakdown of the assessment at each junction can be found in Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR.

Table 6-20: Section 1 – Significance of Effects for Pedestrian Impact during Operational Phase

Junctions	Do Minimum LoS	Do Something LoS	Impact	Sensitivity	Significance of Effect
Dublin Road/ Woodlands Campus	D	B	Medium	Medium	Positive Significant and Long-Term
Dublin Road/ Renmore Park	C	B	Low	High	Positive Moderate and Long-Term
Dublin Road/ Access to Connaught Hotel	C	B	Low	Medium	Positive Moderate and Long-Term
Dublin Road/ Renmore Road	B	A	Low	High	Positive Moderate and Long-Term
Dublin Road/ Michael Collins Road	B	A	Low	Medium	Positive Moderate and Long-Term
Dublin Road/ Ballyloughane Road	B	A	Low	Medium	Positive Moderate and Long-Term
Dublin Road/ Skerritt Roundabout	C	A	Medium	Medium	Positive Significant and Long-Term
Section Summary	C	A	Medium	Medium	Positive, Significant and Long-term

The contents of Table 6-20 demonstrate that the Proposed Development will have a Positive, Significant and Long-term impact on the quality of the pedestrian infrastructure along the Dublin Road / Wellpark Road to Skerritt Roundabout during the Operational Phase.

The LoS during the Do Minimum scenario ranges between D and B, with four of the seven impacted junctions along this section given the low C/D ratings. These ratings have been determined using the previously referenced assessment criteria set out in Table 6-15. The LoS will improve to an A rating at four of the impacted junctions, a B rating at three of the impacted junctions, in the Do Something scenario. This is a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing

locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footpath and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be **Positive, Significant and Long-term effect** to the quality of the pedestrian infrastructure along Section 1 of the Proposed Development, during the Operational Phase. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR.

6.5.7.2.2 Cycling Infrastructure

The following section sets out the qualitative impacts on the cycling receptor for Section 1 of the Proposed Development. The results are summarised in Table 6-21 along with the accompanying sensitivity for each section and the resultant significance of impact.

The key cycling improvements along Section 1 of the Proposed Development can be summarised as follows:

- 2m two-way segregated cycle tracks on each side of the road between the start of the Proposed Development and the R338 Dublin Road/Access Road to Belmont/Ballyloughane Road junction;
- A section of 2m two-way segregated cycle tracks on the same side of the road between the R338 Dublin Road/Access Road to Belmont/Ballyloughane Road junction and Skerrit Roundabout; and
- Proposed toucan crossing approximately 150m west of the Skerrit Roundabout junction.

The contents of Table 6-21 outline the cycling qualitative assessment along Section 1 of the Proposed Development, which sets out the overall Do Minimum LoS and the Do Something LoS and the description of impact. Please refer to Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR which outlines in further detail the methodology behind each LoS rating given to the Do Minimum and Do Something scenarios.

Table 6-21: Section 1 – Cycling Impact during Operational Phase

Route	Do Minimum LoS	Do Something LoS	Impact	Sensitivity	Significance of Effect
R338 Dublin Road/ Brothers of Charity to R338 Dublin Road /Connaught Hotel	D	A	High	High	Positive Profound and Long-term
R338 Dublin Road /Connaught Hotel to R338 Dublin Road to /Michael Collins Road	C	A	Medium	High	Positive Very Significant and Long-term
R338 Dublin Road to /Michael Collins Road to R338 Dublin Road/Belmont/Ballyloughane Road	D	A	High	Medium	Positive, Very Significant and Long-term
R338 Dublin Road/Belmont/Ballyloughane Road to Skerritt Roundabout	D	A	High	Medium	Positive, Very Significant and Long-term
Section Summary	D	A	High	Medium	Positive, Very Significant and Long-term

The contents of Table 6-21 demonstrate that the Proposed Development will have a **Positive, Very Significant and Long-Term effect** on the cycling environment along Section 1 of the Proposed Development.

The Do Minimum Los has been determined using the previously referenced assessment criteria set out in Table 6-17. The LoS rating of the cycling facilities will improve from D in the Do Minimum for three of the impacted routes and C in the Do Minimum for one of the routes, to A in the Do Something along the entirety of Section 1 of the Proposed Development. This is a result of improved cycling infrastructure as part of the Proposed Development, including priority at both signalised and unsignalised junctions.

The findings of the cycling assessment fully align with the objectives applicable to the Traffic and Transport assessment of the Proposed Development, to 'Enhance the potential for cycling by providing a safe network for cycling'. The NTA's I Cycle Design Manual (2023) states, that in relation to cyclist hierarchy of provision, traffic reduction is a priority, before the provision of segregated cycle lanes to create an attractive environment for cyclists. The Proposed Development is designed to reduce traffic significantly and therefore aligns with this hierarchy.

6.5.7.3 Bus Infrastructure

The proposed changes to the bus stop infrastructure along Section 1 of the Proposed Development are outlined in Table 6-22 below.

Table 6-22: Changes in Bus Infrastructure

Inbound / Outbound	Bus Stop Name / No.	Chainage	Location	Retained / Relocated / Removed / New	Existing Facilties	Proposed Facilities	Reason for moving / locating stop
Outbound	Proposed new stop	0+010	50m southeast of the Sáilín Road/ Dublin Road junction	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	Catchment of eastbound passengers from Wellpark Centre
Inbound	Brothers of Charity No. 522961	0+185	50m west of Brothers of Charity entrance	Retained	Bus Shelter, Seating, RTPI	Bus shelter with seating & facilities to incorporate RTPI	N/A
Outbound	Renmore Park No. 522701	0+320	30m north-west of Renmore Park/ Dublin Road junction	Retained	Bus Shelter, Seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Outbound	Glenina Heights No. 524131	0+675	75m east of the Renmore Road/ Dublin Road junction	Retained	Bus Shelter, Seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Inbound	Glenina Heights, No. 524351	0+750	60mwest of the Galway Hospice/ Dublin Road junction	Retained	Bus Shelter, Seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A

Inbound / Outbound	Bus Stop Name / No.	Chainage	Location	Retained / Relocated / Removed / New	Existing Facilties	Proposed Facilities	Reason for moving / locating stop
Outbound	Galwegians RFC No. 524141	1+035	30m west of Belmont/ Dublin Road junction	Retained	Bus Shelter, No seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Inbound	Dublin Road (Dawn Dairies) No. 524341	1+075	50m west of the Ballyoughane Road/ Dublin Rod junction	Retained	Bus Stop, Pole, Pater timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Inbound	Proposed new stop	1+240	115m east of the Ballyoughane Road/ Dublin Rod junction	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	Enhanced bus services provided from intercity routes and private operators/ Catchment of westbound passengers from ATU Galway City
Inbound	Proposed new stop	1+270	125m east of the Ballyoughane Road/ Dublin Rod junction	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	Enhanced bus services provided from intercity routes and private operators / Catchment of westbound passengers from ATU Galway City
Inbound	GMIT No. 522811	1+310	75m west of Galway Garda Regional & Divisional HQ acess	Retained	Bus shelter, No seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Outbound	Proposed new stop	1+320	120m west of Skerrit Roundabout	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	Enhanced bus services provided from intercity routes and private operators/ Catchment of westbound passengers from ATU Galway City

Inbound / Outbound	Bus Stop Name / No.	Chainage	Location	Retained / Relocated / Removed / New	Existing Facilties	Proposed Facilities	Reason for moving / locating stop
Outbound	Proposed new stop	1+350	100m west of Skerrit Roundabout	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	Enhanced bus services provided from intercity routes and private operators/ Catchment of westbound passengers from ATU Galway City
Outbound	GMIT No. 522811	1+400	85m west of Skerrit Roundabout	Retained	Bus Shelter, Seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A

The contents of Table 6-22 indicate that there are considerable improvements to the bus stop facilities along Section 1 of the Proposed Development with the provision of shelters, seating, the facilities to incorporate real-time passenger information, and accessible kerbs throughout. These improvements and the provision and layout of five new bus stops is considered to better serve the existing and future passenger catchment. This is assessed as providing an overall **Positive, Moderate and Long-term effect** for bus passengers.

6.5.7.4 Parking & Loading

There is no on-street parking or loading bays present in this sub-section and no changes are going to be made in this matter at the Proposed Development.

However, the Proposed Development will impact on existing private parking and loading along Section 1of the Proposed Development. The contents of Table 6-23: present a summary of the proposed changes along Section 1 of the Proposed Development.

Table 6-23: Section 1 – Overall Changes In Parking / Loading Spaces

Location	Parking Type	Chainage	Do Minimum	Do Something	Change
Dublin Road	Paid Commercial	0+ 065	15	13	-2
		0+580	18	10	-8
	Bus Set Down	1+275	1 bay	4 bays (2 spaces)	3
Total			34	27	-7

Overall, there are approximately 34 current parking spaces affected along Section 1 of the Proposed Development. Under the proposals, 7 parking / loading spaces will be lost, all paid for/commercial spaces. It is noted that these are all private parking spaces, and other parking spaces for each location are available. In addition, an increase in 3 bus set down bays will be provided.

The changes are considered to have a **Negative, Slight and Long-term effect** overall, due to the number of spaces lost, compared to the spaces available privately. This effect is considered acceptable in the

context of the aim of the Proposed Development, to provide enhanced walking, cycling and bus infrastructure on this key access corridor. In addition to this, reducing parking within the city centre links with national and regional policy requirements to shift away from private car use as a form of traffic demand management, and help meet Ireland's climate action target.

6.5.7.5 Section 2 – Skerritt Roundabout – R338 Dublin Road/Doughiska Road

6.5.7.5.1 Pedestrian Infrastructure Changes

The key infrastructural changes to the pedestrian link along Section 2 of the Proposed Development are the following:

- Raised junction treatments added to the majority of minor arms/ accesses at unsignalised junctions, reducing vehicle speeds;
- Extended/ additional footpaths to a minimum of 2m wide across the whole section;
- Existing footpath widened adjacent to the Connaught Hotel access;
- Upgrade of the Dublin Road/ Merlin Meadows junction to a four-arm signalised junction, with signals on three arms.
- Upgrade of the Dublin Road/ Rosshill Road junction to a three-arm signalised junction, with signals on all arms.
- Upgrade of signalised crossings on all arms of the Dublin Road/ Coast Road junction to toucan crossings; and
- Upgrade of signalised crossings on all arms of the Dublin Road/ Merlin Park Lane junction to toucan crossings.

The assessment of the qualitative impacts on the pedestrian infrastructure for Section 2 of the Proposed Development is summarised in Table 6-24 along with the accompanying sensitivity for each junction and the resultant significance of impact.

Table 6-24: Section 2 – Significance of Effects for Pedestrian Impact during Operational Phase

Junctions	Do Minimum LoS	Do Something LoS	Impact	Sensitivity	Significance of Effect
Dublin Road/ Woodhaven	C	B	Low	Low	Positive Slight and Long-term
Dublin Road/ Merlin Meadows	F	A	High	Medium	Positive Very Significant and Long-Term
Dublin Road/ Merlin Park Lane	C	A	Medium	Low	Positive Moderate and Long-Term
Dublin Road/ Rosshill Road	D	A	Medium	Low	Positive Moderate and Long-Term
Dublin Road/ Coast Road	C	A	Medium	Low	Positive Moderate and Long-Term
Dublin Road/Doughiska Road	C	A	Medium	Medium	Positive Significant and Long-Term
Section Summary	C	A	Medium	Low	Positive Moderate and Long-Term

The contents of Table 6-24 demonstrate that the Proposed Development will have a Positive, Moderate and Long-term impact on the quality of the pedestrian infrastructure at junctions between Skerritt Roundabout and Martin Roundabout.

The LoS during the Do Minimum scenario ranges between C and F, with one of the six impacted junctions along this section given the low F rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 6-15. The LoS will improve to an A rating at five of the

impacted junctions, and a B rating at one of the impacted junctions, in the Do Something scenario. This is a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footpath and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be **Positive, Significant and Long-term effect** to the quality of the pedestrian infrastructure along Section 2 of the Proposed Development, during the Operational Phase. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in Appendix 6.2 (Impact Assessments) in Volume 4 of this EIAR.

6.5.7.5.2 Cycling Infrastructure

The key cycling improvements along Section 2 of the Proposed Development can be summarised as follows:

- 2m two-way segregated cycle tracks on each side of the road between Skerritt Roundabout and the R336 Dublin Road/Coast Road junction;
- 2m two-way segregated cycle tracks on the same side of the road between the R338 Dublin Road/Coast Road junction and the R338 Dublin Road/Doughiska Road junction; and
- Off-shoot segregated westbound cycle lane on the R338 Dublin Road, linking to Coast Road.

The contents of Table 6-25 outline the cycling qualitative assessment along Section 2 of the Proposed Development, with reference to the accompanying sensitivity for each section and the resultant Significance of Impact.

Table 6-25: Cycling Impact during Operational Phase

Route	Do Minimum LoS	Do Something LoS	Impact	Sensitivity	Significance of Effect
Skerritt Roundabout to Merlin Park Hospital Access	D	A	High	Medium	Positive Very Significant and Long-term
Merlin Park Hospital Access/ to R338 Dublin Road/Rosshill Road	C	A	Medium	Low	Positive Moderate and Long-term
R338 Dublin Road/Rosshill Road to R338 Dublin Road/Doughiska Road	C	A	Medium	Low	Positive Moderate and Long-term
Section Summary	C	A	Medium	Medium	Positive Significant and Long-term

The contents of Table 6-25 that the Proposed Development will have a **Positive, Significant and Long-term effect** on the cycling environment along Section 2 of the Proposed Development.

The Do Minimum Los has been determined using the previously referenced assessment criteria set out in Table 6-17. The LoS rating of the cycling facilities will improve from D in one of the impacted routes and C on two of the impacted routes in the Do Minimum to A in the Do Something along the entirety of Section 2 of the Proposed Development. This is a result of improved safety for cyclists associated with the Proposed Development.

The findings of the cycling assessment fully align with the objective of the Proposed Development, applicable to the Traffic and Transport assessment of the Proposed Development, to 'Enhance the potential for cycling by providing a safe network for cycling.'

6.5.7.5.3 Bus Infrastructure

The proposed changes to the bus stop infrastructure along Section 2 of the Proposed Development are outlined in Table 6-26 below.

Table 6-26: Changes in Bus Infrastructure

Inbound / Outbound	Bus Stop Name / No.	Chainage	Location	Retained / Relocated / Removed / New	Existing Facilities	Proposed Facilities	Reason for moving / locating stop
Inbound	Dublin Road (Opp. Woodhaven) No. 522831	1+705	30m west of Merlin Gate/ Dublin Road junction	Retained	Bus Shelter, No seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Outbound	Proposed new stop	1+790	30m west of entrance to Merlin Park University Hospital	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	New bus stop to correspond with westbound bus stop/due to enhances number of services.
Inbound	Dublin Road (Kingsvalley Hotel) No. 524331	2+100	50m west of Merlin Park Lane/ Dublin Road junction	Retained	Bus shelter, Seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A
Outbound	Galway Crystal No. 524151	2+135	100m east of Merlin Park Lane/ Dublin Road junction	Relocated 120m west, opposite existing westbound stop	Bus shelter, No seating, Paper timetable	Bus shelter with seating & facilities to incorporate RTPI	Closer to existing pedestrian crossing
Outbound	Coast Road Junction No. 524171	3+350	70m west of Coast Road/ Dublin Road Junction	Relocated 125m east of the existing stop	Bus Pole, No paper timetable	Bus shelter with seating & facilities to incorporate RTPI	Moved away from private property entrance/ better alignment with new pedestrian crossings
Inbound	Proposed new stop	3+350	50m east of Coast Road/ Dublin Road junction	New	N/A	Bus shelter with seating & facilities to incorporate RTPI	There is a 1.6km distance between current westbound stops/ alignment with new pedestrian crossings
Inbound	Dublin Road (Castlegar Complex) No. 524321	3+720	60m west of Doughiska Road/ Dublin	Retained	Bus Shelter, Seating, RTPI	Bus shelter with seating & facilities to	N/A

Inbound / Outbound	Bus Stop Name / No.	Chainage	Location	Retained / Relocated / Removed / New	Existing Facilities	Proposed Facilities	Reason for moving / locating stop
			Road junction			incorporate RTPI	
Outbound	Castlegar GAA Club No. 524181	3+760	40m west of Doughiska Road/ Dublin Road junction	Retained	Bus Pole, No paper timetable	Bus shelter with seating & facilities to incorporate RTPI	N/A

Table 6-26 indicates that there are improvements to the bus stop facilities with the provision of shelters, seating, the facilities to accommodate real-time passenger information and accessible kerbs throughout. There will be an addition of two new bus stops and two existing bus stops will be relocated to better align with new pedestrian crossing facilities. It is considered that the layout of the new and relocated bus stops will better serve existing and future passenger catchment. This is assessed as providing an overall **Positive, Moderate and Long-term effect** for bus passengers.

6.5.7.5.4 Parking & Loading

There are no parking spaces along Section 2 of the Proposed Development which will be impacted.

6.5.8 Quantitative Analysis

This quantitative assessment has been prepared with reference to the modelling outputs obtained from the three-tiered modelling approach outlined in Section 6.3.2 The following assessment topics have been considered:

People Movement:
- Peak Hour People Movement along the Proposed Development;
- People Movement by Bus; and
- Bus Boarding.

Bus Network Performance Indicators:
- Bus Journey Times; and
- Bus Journey Time Reliability.

General Traffic Network Performance Indicators:
- Junction Capacity Outputs on the Direct Study Area; and
- Redistributed flows and Junction Capacity Outputs on the Indirect Study Area.

6.5.8.1 People Movement Assessment

6.5.8.1.1 Overview

In order to understand the benefit of the Proposed Development with regards to the Movement of People following the implementation of the proposed infrastructure measures, a quantitative People Movement assessment has been undertaken using outputs from the NTA WRM and LAM and comparing the Do Minimum and Do Something peak hour scenarios for each forecast year (2028, 2043).

The assessment of People Movement includes the following metrics:

- The average number of people moved by each transport mode (i.e., Car, Bus, Walking and Cycling) along the corridor in the eastbound and westbound direction. This metric is compared for the Do

Minimum and Do Something scenarios in the AM and PM peak hours for each forecast year (2028, 2043). This metric provides an estimate of the modal share changes along the route as a result of the Proposed Development measures; and

- People Movement by Bus:
  - AM and PM peak hour Bus Passenger Loadings along the Proposed Development for each forecast year (2028, 2043); and
  - Total Passengers Boarding Buses on bus routes that use any part of the Proposed Development for each forecast year (2028, 2043).

6.5.8.1.2 Peak Hour People Movement along the Proposed Development

To determine the impact that the Proposed Development has on modal share in the study area as a result of its implementation, the weighted average number of people moved by each mode (Car, Bus, Active Modes) has been extracted from the WRM / LAM. The analysis compares the Do Minimum and Do Something scenarios both in the eastbound and westbound direction in the AM and PM peak hours (8-9am, 5-6pm) for each forecast year (2028, 2043).

As outlined previously, the same demographic assumptions (population, employment levels) are included in both the Do Minimum and Do Something scenarios. The bus network and frequency assumptions are also the same in both scenarios and are in line with the network proposals. The Do Something scenario will facilitate opportunities to increase bus network capacity operating along the corridor due to the extensive priority provided.

In addition to this, the significant segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Development will further maximise the movement of people travelling sustainably along the corridor and will therefore cater for higher levels of future population and employment growth. In the absence of the delivery of the Proposed Development, growth along this key corridor would continue to contribute to increased congestion and operational issues on the road network. The Proposed Development delivers a reliable alternative to car-based travel that can support future sustainable growth and provide a positive contribution towards reducing carbon emissions.

The contents of Table 6-27 and Table 6-28 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in both directions during the AM Peak Hour. The results indicate a 7% (westbound) and 4% (eastbound) increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6-27 Mode Shift of 2028 AM Peak Hour: Westbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Westbound	AM	General Traffic	817	64%	854	63%	36	4%
		Public Transport	418	32%	455	33%	37	9%
		Walking	35	3%	36	3%	0	1%
		Cycling	16	1%	17	1%	1	7%
		Sustainable Modes Total	470	36%	508	37%	38	8%

Table 6-28 Mode Shift of 2028 AM Peak Hour: Eastbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Eastbound	AM	General Traffic	669	75%	616	73%	-53	-8%
		Public Transport	197	22%	206	24%	9	4%
		Walking	19	2%	19	2%	0	-1%
		Cycling	6	1%	6	1%	0	8%
		Sustainable Modes Total	222	25%	231	27%	9	4%

The contents of Table 6-29 and Table 6-30 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in both directions during the PM Peak Hour. The results indicate a 7% (westbound) and 20% (eastbound) increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6-29: Mode Shift of 2028 PM Peak Hour: Westbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Westbound	PM	General Traffic	665	78%	631	76%	-34	-5%
		Public Transport	162	19%	174	21%	12	7%
		Walking	20	2%	20	2%	0	2%
		Cycling	9	1%	10	1%	1	7%
		Sustainable Modes Total	191	22%	204	24%	13	7%

Table 6-30: Mode Shift of 2028 PM Peak Hour: Eastbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Eastbound	PM	General Traffic	801	72%	824	69%	23	3%
		Public Transport	270	24%	330	28%	60	22%
		Walking	23	2%	23	2%	0	-1%
		Cycling	12	1%	12	1%	0	3%
		Sustainable Modes Total	305	28%	365	31%	60	20%

The contents of Table 6-31 and Table 6-32 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in both directions during the AM Peak Hour. The results indicate a 9% (westbound) and 2% (eastbound) increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6-31: Mode Shift of 2043 AM Peak Hour: Westbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Westbound	AM	General Traffic	636	48%	629	46%	-7	-1%
		Public Transport	591	45%	651	48%	59	10%
		Walking	55	4%	57	4%	1	2%
		Cycling	30	2%	32	2%	2	7%
		Sustainable Modes Total	677	52%	739	54%	62	9%

Table 6-32: Mode Shift of 2043 AM Peak Hour: Eastbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Eastbound	AM	General Traffic	523	65%	571	67%	48	9%
		Public Transport	244	30%	251	29%	7	3%
		Walking	27	3%	27	3%	0	-1%
		Cycling	8	1%	9	1%	1	7%
		Sustainable Modes Total	279	35%	286	33%	7	2%

The contents of Table 6-33 and Table 6-34 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in both directions during the PM Peak Hour. The results indicate a 6% (westbound) and 23% (eastbound) increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6-33: Mode Shift of 2043 PM Peak Hour: Westbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Westbound	PM	General Traffic	556	68%	580	68%	24	4%
		Public Transport	216	27%	231	27%	14	7%
		Walking	28	3%	28	3%	0	0%

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
		Cycling	12	2%	13	2%	1	4%
		Sustainable Modes Total	257	32%	272	32%	15	6%

Table 6-34: Mode Shift of 2043 PM Peak Hour: Eastbound

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trip	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Eastbound	PM	General Traffic	866	68%	874	64%	8	1%
		Public Transport	342	27%	434	32%	92	27%
		Walking	36	3%	36	3%	0	0%
		Cycling	20	2%	21	2%	1	5%
		Sustainable Modes Total	398	32%	491	36%	93	23%

6.5.8.1.3 People Movement – Conclusions

In summary, the People Movement Assessment above has shown increases in sustainable modes in both 2028 and 2043 as a result of the Proposed Development. For public transport, we see the biggest increases in the eastbound direction along the corridor, particularly in the PM, given the volume of flows which use the corridor to exit the city and given there is no existing bus lane in this direction. As such, we see a bigger impact for public transport numbers in this direction, compared with the westbound, which already has a good coverage of bus lane. Despite the general growth in traffic levels between 2028 and 2043, traffic along the corridor is generally either reducing or increasing at marginal levels and any increases in general traffic are related to minor levels of traffic redistribution. Sustainable modes on the other hand see an increase between 2028 and 2043. This shows that car trips – unlike public transport, walking and cycling - do not grow in line with population. Therefore, the Proposed Development is providing a substantial opportunity for growth of sustainable modes whilst it discourages car usage along the corridor.

6.5.8.1.4 People Movement – Significance of Impact

The significance of impact for the movement of People by sustainable modes with the Proposed Development in place has been appraised qualitatively, taking into account the changes in mode share, demand changes by mode along the Proposed Development as well as bus usage presented above.

The Proposed Development has been adjudged to deliver a **Positive, Significant and Long-term impact** in terms of People Movement by sustainable modes. The Proposed Development can be shown to deliver significant improvements in people movement by sustainable modes along the Proposed Development corridor, particularly by bus, with reductions in car mode share due to the enhanced sustainable mode provision.

6.5.8.2 People Movement by Bus

The following section presents the WRM demand outputs for People Movement by Bus in terms of passenger loadings along the corridor. The results indicate that the improvements in bus priority

infrastructure with the Proposed Development in place show a substantial increase in Bus patronage during the peak hours.

Figure 6-18 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the westbound direction in 2028.

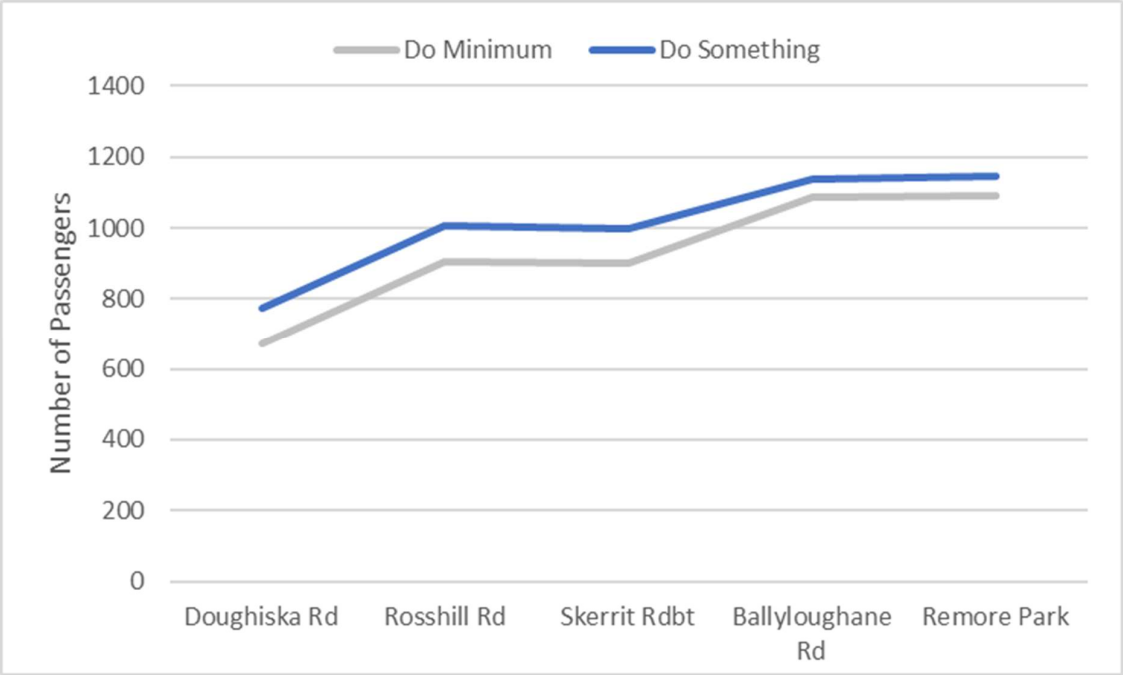

Figure 6-18: 2028 AM Peak Hour Passenger Volume along Proposed Development (westbound direction)

The figure above shows higher levels of bus passenger loadings along the Proposed Development. The volume of passengers reaches its peak near Ballyloughane Road with an approx. volume of 1,140 passengers in the AM Peak hour, compared to approximately 1,080 in the Do Minimum scenario.

Figure 6-19 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the eastbound direction in 2028.

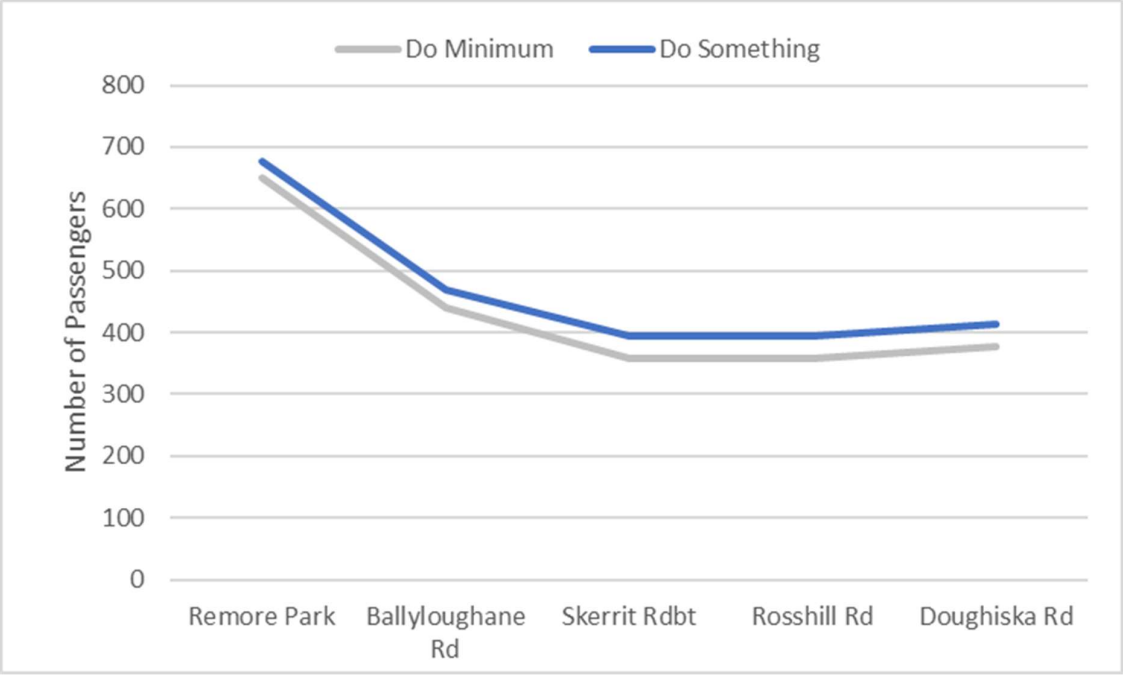

Figure 6-19: 2028 AM Peak Hour Passenger Volume along Proposed Development (eastbound direction)

The figure above shows higher levels of bus passenger loadings along the Proposed Development. The volume of passengers is at its peak at Renmore Park, with an approx. volume of 680 passengers in the AM Peak hour, compared to approximately 650 in the Do Minimum scenario.

Figure 6-18 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the westbound direction in 2028.

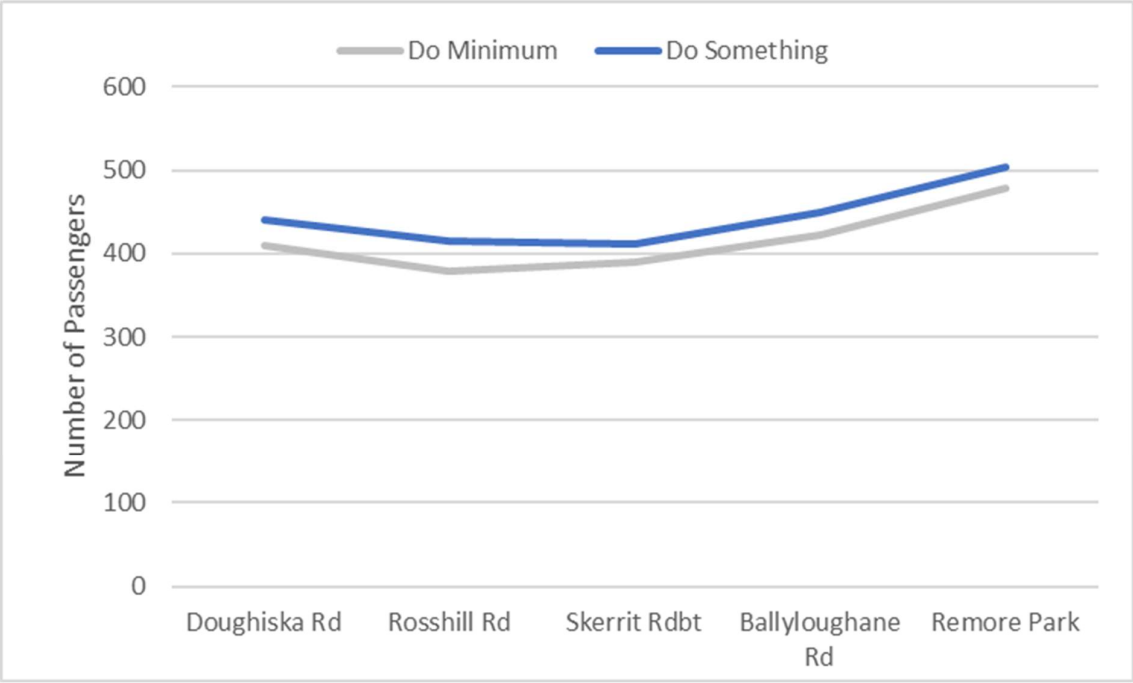

Figure 6-20: 2028 PM Peak Hour Passenger Volume along Proposed Development (westbound direction)

The figure above shows higher levels of bus passenger loadings along the Proposed Development. The volume of passengers reaches its peak near Renmore Park with an approx. volume of 500 passengers in the PM Peak hour, compared to approximately 480 in the Do Minimum scenario.

Figure 6-19 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the eastbound direction in 2028.

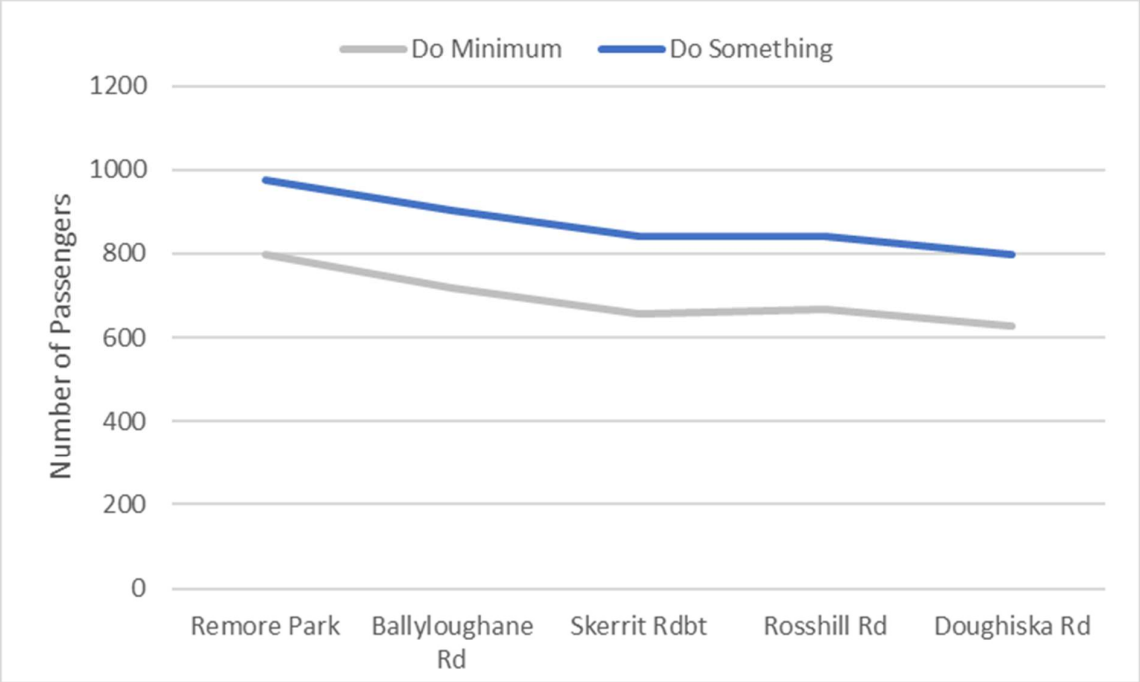

Figure 6-21: 2028 PM Peak Hour Passenger Volume along Proposed Development (eastbound direction)

The figure above shows higher levels of bus passenger loadings along the Proposed Development. The volume of passengers is at its peak at Renmore Park, with an approx. volume of 980 passengers in the PM Peak hour, compared to approximately 800 in the Do Minimum scenario.

6.5.8.2.1 Bus Boardings

An additional assessment has been undertaken to compare the Do Minimum and Do Something total passengers boarding on bus routes that use any part of the Proposed Development in both 2028 and 2043 forecast years. The results for the 2028 Opening Year scenario are indicated in Table 6-35:

Table 6-35: 2028 Peak Hour Bus Boardings on Routes using the Proposed Development

Time Period	Do Minimum (no. of boardings)	Do Something (no. of boardings)	Difference in no. of boardings	Difference (%)
AM	1264	1402	138	11%
PM	1139	1354	215	19%

The contents of Table 6-35: show that there will be a 11% increase in people boarding bus routes which use the Proposed Development during the AM Peak Hour. This represents an addition of 138 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 19% increase in people boarding bus routes which use the Proposed Development, representing an additional 215 passengers.

The comparison results for the 2043 Design Year scenario are indicated in Table 6-36:

Table 6-36: 2043 Peak Hour Bus Boardings on Routes using the Proposed Development

Time Period	Do Minimum (no. of boardings)	Do Something (no. of boardings)	Difference in no. of boardings	Difference (%)
AM	1788	1992	204	11%
PM	1383	1709	326	24%

The contents of Table 6-36: show that there will be an 11% increase in people boarding bus routes which use the Proposed Development during the AM Peak Hour. This represents an addition of 204 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 24% increase in people boarding bus routes which use the Proposed Development, representing an additional 326 passengers.

6.5.8.3 Operational Impacts for Bus Users

6.5.8.3.1 Overview

The impacts of the Proposed Development for Bus Users have been assessed based on journey times and reliability metrics extracted from the micro-simulation model of the Proposed Development corridor.

Due to the stochastic nature of the micro-simulation software, model outputs based on the average of 10 simulation seed runs (minimum of 5 recommended as per Transport for London (2021) Traffic Modelling Guidelines[2]) have been calculated between the point of entry and exit to the Proposed Development and compared against the corresponding Do Minimum scenarios.

6.5.8.3.2 Bus Journey Time and Reliability changes as a result of the Proposed Development

To give an overview of how the Proposed Development will impact on bus journey times along the Proposed Development, outputs for all services combined, for the entire length of the Proposed Development only, have been extracted from the model.

Eastbound Direction

Average journey times for all eastbound services in the 2028 Opening Year can be seen in Table 6-37: Bus Average Journey Times (All Eastbound Services).

Table 6-37: Bus Average Journey Times (All Eastbound Services)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	25.4	16.0	- 9.4	-37%
2028 PM	29.4	17.4	- 12.0	-40%

Additional information regarding the range of journey times (minimum, maximum and average) for all eastbound services combined in the Do Minimum and Do Something can be seen in Table 6-38: , Figure 6-22: and Figure 6-23: below. The minimum, maximum and average journey times are represented as a

[2] https://content.tfl.gov.uk/traffic-modelling-guidelines.pdf

dot in the graphs for buses in each scenario. A larger range of journey times are an indication of lower levels of reliability in a given scenario.

Table 6-38: Range of Journey Times (Eastbound Services)

Peak Hour	Do Minimum			Do Something		
	MIN	MAX	AVG	MIN	MAX	AVG
2028 AM	24.2	25.4	26.7	15.4	16.0	16.8
2028 PM	26.5	29.4	33.7	16.8	17.4	18.3

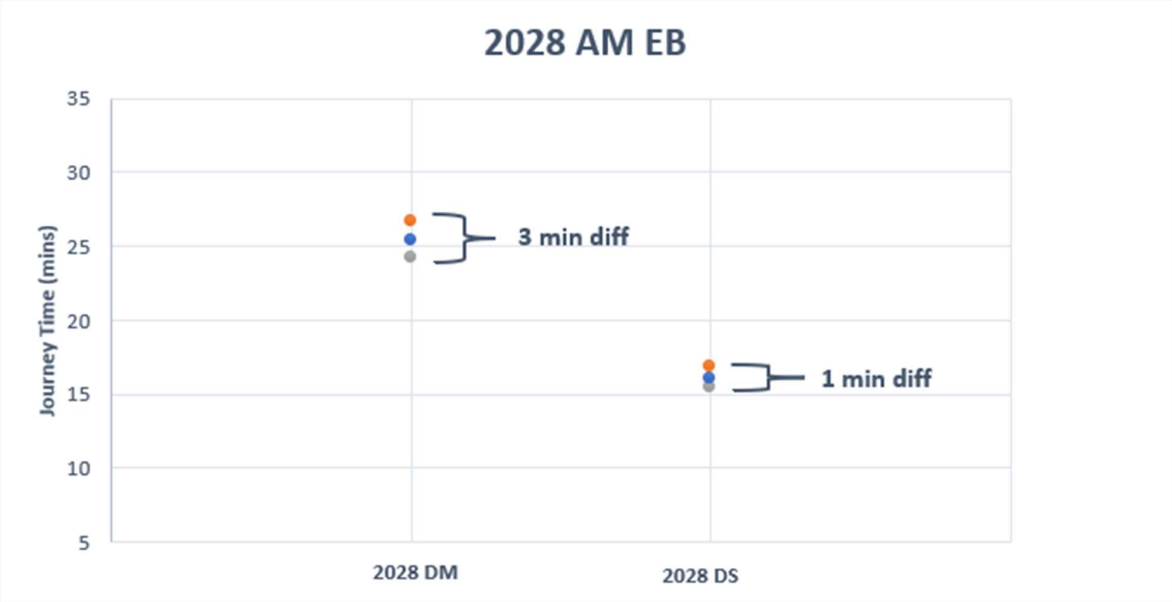

Figure 6-22: AM Bus Journey Times (Eastbound Services)

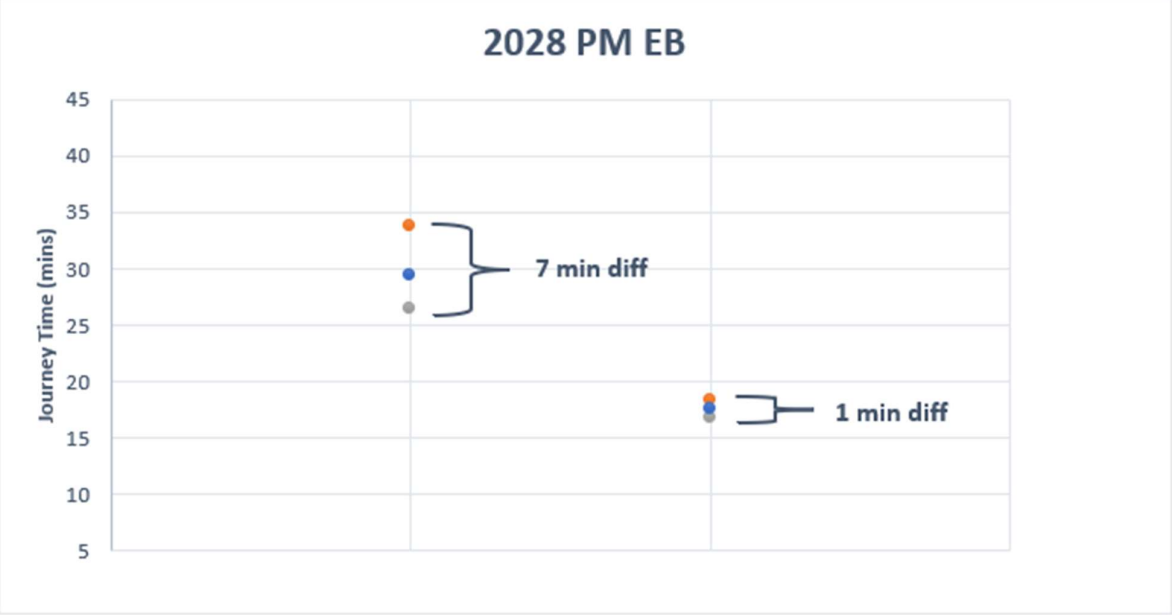

Figure 6-23: PM Bus Journey Times (Eastbound Services)

Based on the results presented above, the Proposed Development will deliver average journey time savings for eastbound bus passengers of up to 9 minutes (37%) in 2028 during the AM peak hour and 12 minutes (40%) in the PM peak hour. Furthermore, results presented in Figure 6-22 and Figure 6-23 suggest an improvement in bus journey time reliability across both morning and evening peak hour scenarios as indicated by the reduced ranges of journey times achieved with the max and min journey times focused much closer to the average journey times in the Do Something scenario with the Proposed Development in place compared to the more dispersed range in the Do Minimum scenario.

Note that the variation in journey times shown above are based on one set of predicted flows for the Do Minimum and Do Something scenario. Traffic flows fluctuate daily which would mean that the variation in journey times would be much greater in the Do Minimum with any increases in traffic flows compared to the protection of journey time reliability provided by the bus priority measures that comprise the Proposed Development.

Westbound Direction

Average journey times for all westbound services in the 2028 Opening Year can be seen in Table 6-39: .

Table 6-39: Bus Average Journey Times (All Westbound Services)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	17.1	12.1	- 5.0	-29%
2028 PM	23.1	17.1	- 6.0	-26%

Additional information regarding the range of journey times (minimum, maximum and average) for all westbound services combined in the Do Minimum and Do Something can be seen in Table 6-40.

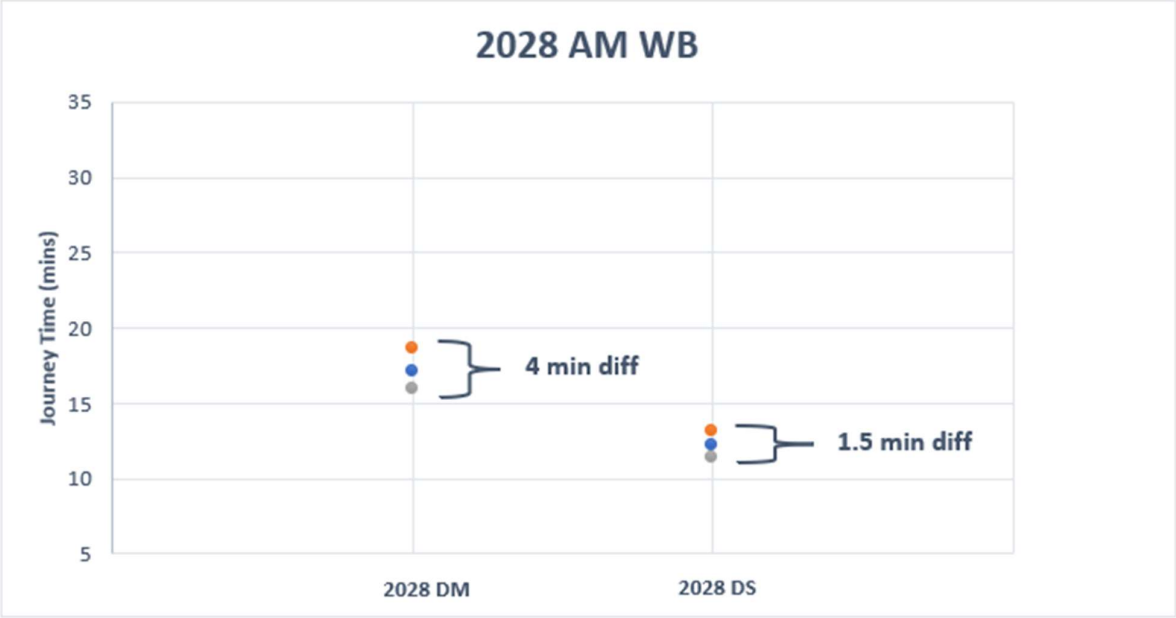

Figure 6-24: and Figure 6-25: The minimum, maximum and average journey times are represented as a dot in the graphs for buses in each scenario. A larger range of journey times are an indication of lower levels of reliability.

Table 6-40: Range of Journey Times (Westbound Services)

Peak Hour	Do Minimum			Do Something		
	MIN	MAX	AVG	MIN	MAX	AVG
2028 AM	15.9	17.1	18.6	11.4	12.1	13.1
2028 PM	21.7	23.1	24.7	16.3	17.1	18.0

Figure 6-24: AM Bus Journey Times (Westbound Services)

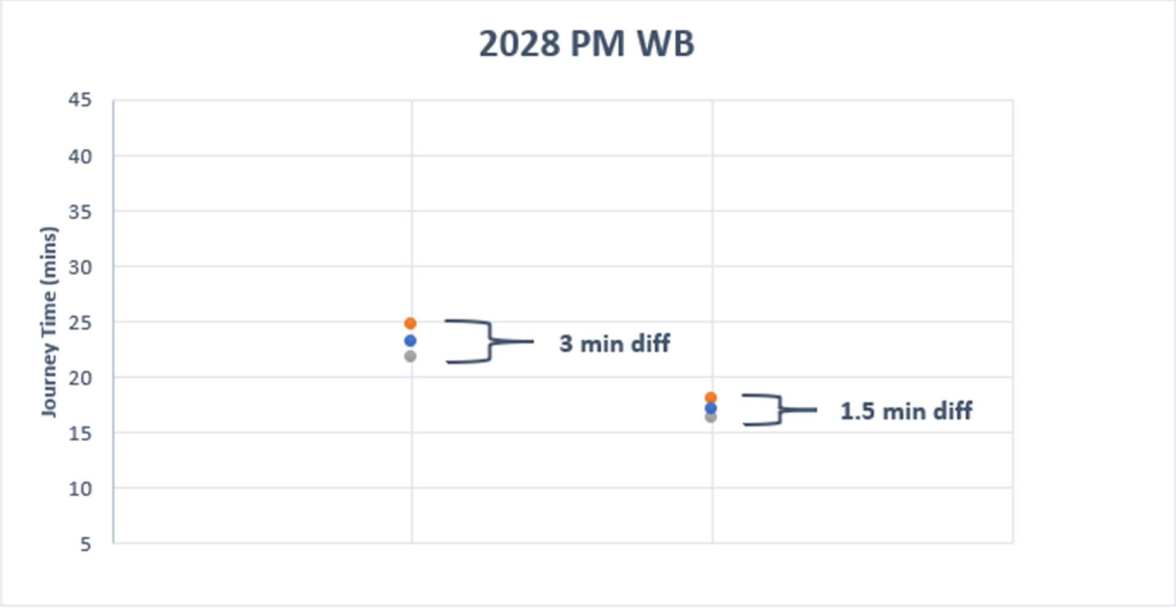

Figure 6-25: PM Bus Journey Times (Westbound Services)

Based on the results presented in above, the Proposed Development will deliver average journey time savings for westbound bus passengers of 5 minutes (29%) in 2028 during the AM peak hour and 6 minutes

(26%) in the PM peak hour. Furthermore, results presented in Figure 6-26 and Figure 6-27 suggest a slight improvement in bus journey time reliability across both morning and evening peak hour scenarios as indicated by the reduced ranges of variability of journey times achieved. The maximum and minimum journey times are closer to the average journey times in the Do Something scenario with the Proposed Development in place compared to the journey times in Do Minimum scenario.

Note that the variation in journey times shown above are based on one set of predicted flows for the Do Minimum and Do Something scenario. Traffic flows fluctuate daily which would mean that the variation in journey times would be much greater in the Do Minimum with any increases in traffic flows compared to the protection of journey time reliability provided by the bus priority measures that comprise the Proposed Development.

6.5.8.4 General Traffic Assessment

6.5.8.4.1 Overview

The Proposed Development aims to provide an attractive alternative to the private car and promote a modal shift to public transport, walking and cycling. It is, however, recognised that there will be an overall reduction in operational capacity for general traffic along the direct study area given the proposed changes to the road layout and the rebalancing of priority to walking, cycling and bus. This reduction in operational capacity for general traffic along the Proposed Development will likely create some level of trip redistribution onto the surrounding road network.

It should be noted that the Do Minimum and Do Something scenarios assume that travel behaviour will remain broadly consistent over time and that car demand, used for this assessment, represents a reasonable worst-case scenario. It is possible that societal trends in the medium to long term may reduce car demand further due to the ongoing changes to travel behaviours and further shifts towards sustainable travel, flexibility in working arrangements brought on following COVID-19, and delayed car ownership trends that are emerging.

The assessment also assumes that goods vehicles (HGVs and LGVs) continue to grow in line with forecasted population growth and economic activity with patterns of travel remaining the same. It should be noted that the 2023 Climate Action Plan (CAP) (DCCAE 2023) includes reference to DTTAS's Ireland's Road Haulage Strategy 2022–2031 (RHS) (2023) which will seek to further integrate smart technologies in logistics management and may include the regulation of delivery times as far as practicable to off-peak periods to limit traffic congestion in urban areas. Ireland's Road Haulage Strategy 2022–2031 (Department of Transport, 2022) outlines measures to manage the increase in delivery and servicing requirements as the population grows. These measures may include the development of consolidation centres to limit the number of 'last-mile' trips made by larger goods vehicles with plans for higher use of smaller electric vans or cargo bikes for 'last-mile' deliveries in urban areas.

As proposals for the above are at a pre-planning stage, it was not possible to account for them in the assessments and a worst-case assessment has been undertaken based on continued growth in goods traffic.

The purpose of this section is to assess the overall impact that any redistributed general traffic will have on both the direct and indirect study areas. It should be noted that the impacts presented in this chapter are based on the final Preliminary Design for the Proposed Development which includes embedded mitigation to limit environmental and traffic and transport impacts to a minimal level as part of the iterative design development work described previously above.

6.5.8.4.2 Significance of the General Traffic Impact

To determine the impact that the Proposed Development has in terms of general traffic redistribution on the direct and indirect study areas, the LAM Opening Year 2028 model results have been used to identify the difference in general traffic flows between the Do Minimum and Do Something scenarios and the associated

level of traffic flow difference as a result of the Proposed Development. The assessment has been considered with reference to both the reductions and increases in general traffic flows along road links.

Significance of a Reduction in General Traffic: For this assessment, the reductions in general traffic flows have been described as a positive impact to the environment. The significance of this positive impact is outlined by the contents of Table 6-41: .

Table 6-41: Significance of the Reduction in General Traffic Flows

Significance of Positive Impact	Description of Impact / Proposed Changes in Two-Way Hourly Traffic Flows
Profound	< -1,000
Very Significant	-1,000 to -800
Significant	-800 to -400
Moderate	-400 to -300
Slight	-300 to -100
Not Significant	> -100
Profound	< -1,000

The majority of instances where a reduction in general traffic flow occurs are located along or adjacent to the Proposed Development (i.e. the direct study area), where there are proposed measures to improve priority for bus, cycle and walking facilities.

Significance of an Increase in General Traffic: To determine the impact that the Proposed Development has in terms of an increase in general traffic flows on the direct and indirect study areas, a robust assessment has been undertaken, with reference to TII's Traffic and Transport Assessment Guidelines (2014).

This document is considered best practice guidance for the assessment of transport impacts related to changes in traffic flows due to proposed developments and is an appropriate means of assessing the impact of general traffic trip redistribution on the surrounding road network.

Figure 6-26: is a snapshot from the guidance which outlines "Advisory Thresholds for Traffic and Transport Assessment Where National Roads are Affected".

Where applications affect national roads a Transport Assessment should be requested if the thresholds in Table 2.2, below, are exceeded.

Table 2.2 Advisory Thresholds for Traffic and Transport Assessment Where National Roads are Affected

Vehicle Movements	*100 trips in / out combined in the peak hours for the proposed development*
	Development traffic exceeds 10% of turning movements at junctions with and on National Roads.
	Development traffic exceeds 5% of turning movements at junctions with National Roads if location has potential to become congested or sensitive.

Traffic and Transport Assessment Guidelines PE-PDV-02045 May 2014, TII Publications

Figure 6-26: Extract from the Traffic and Transport Assessment Guidelines (PE-PDV-02045, May 2014)

The basis of the guidance is to assess the impacts of additional trips that have been generated as part of a new development (for example, a new housing estate etc.). Noting that the guidance relates to National Roads only, for the purpose of this assessment, the principles of the guidance have been adapted for the assessment of the Proposed Development. This has been achieved by extending the threshold to cover all road types in the vicinity of the Proposed Development, not only National Roads. This ensures a robust and

rigorous assessment is undertaken and that potential impacts on more localised or residential streets have been captured as part of the assessment.

The impact assessment of increases to the general traffic flows has used the following thresholds based on the above guidelines:

- Local / Regional Roads: Traffic redistribution results in an increase above 100 combined flows (i.e. in a two-way direction) along residential, local and regional roads in the vicinity of the Proposed Development in the AM and PM peak hours;
  - The threshold aligns with an approximate 1 vehicle per minute increase per direction on any given road. This is a very low level of traffic increase on any road type and ensures that a robust assessment of the impacts of redistributed traffic has been undertaken.
- National Roads: Traffic exceeds 5% of the combined turning flows at major junctions with/ on/or with national roads in the AM and PM peak hours as a result of traffic redistribution comparing the Do Minimum to the Do Something scenario with the Proposed Development in place.
  - The guidelines indicate that a 10% threshold may be used, however, to ensure a rigorous assessment in this instance the lower 5% threshold for turning movements has been utilised.

Where road links have been identified as experiencing additional general traffic flow increases which exceed the above thresholds, a further assessment has been undertaken by way of a traffic capacity analysis on the associated junctions along the affected links.

6.5.8.4.3 General Traffic Flow Difference – AM Peak Hour

Figure 6-27 illustrates the difference in traffic flows on the road links in the AM Peak Hour for the 2028 Opening Year. Please see Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR for the full LAM outputs.

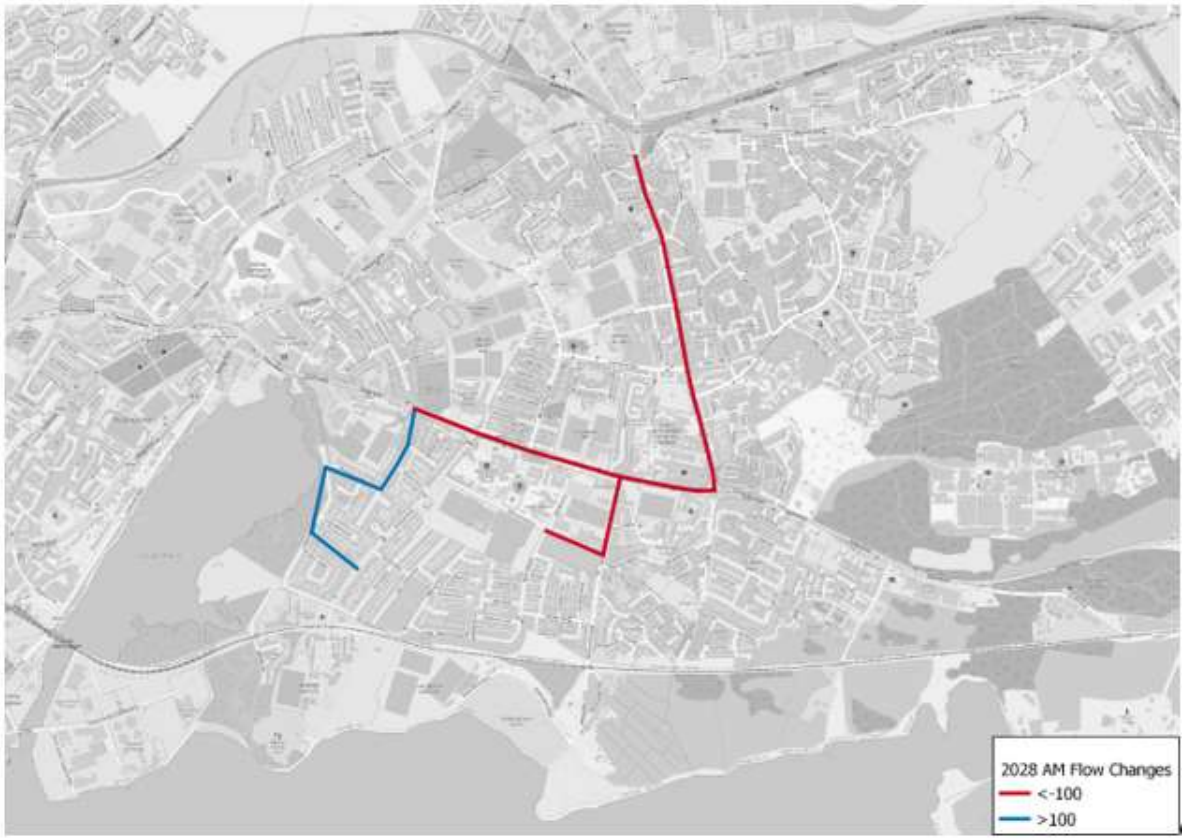

Figure 6-27: Figure 6-27: Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2028 Opening Year

Reductions in General Traffic: The LAM indicates that, during the 2028 Opening Year scenario, there are reductions in general traffic noted along the Proposed Development during the AM Peak Hour, as illustrated by the red lines which indicate where a reduction of at least -100 combined traffic flows occurs.

The key reductions in traffic flows during the AM Peak Hour are outlined in Table 6-42

Table 6-42 Road Links that Experience a Reduction of ≥100 Combined Flows (AM Peak Hour, 2028)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference (PCU)
BALLYBANE ROAD	1,294	1,052	-242
BALLYLOUGHANE ROAD	689	437	-252
DUBLIN ROAD	1,690	1,362	-328
RENMORE AVENUE	540	374	-166

The contents of Table 6-42 demonstrate that there is a reduction of between -166 and -328 general traffic flows along the direct study area during the AM Peak Hour, which is attributed to the Proposed Development and the associated modal shift as a result of its implementation. This reduction in general traffic flow averages at -247 across all road links, which is determined as an overall Positive, Slight and Long-term effect on the direct study area, in accordance with Table 6-41. The most significant effect occurs on the Dublin Road, which is the main corridor of the Proposed Development.

Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the blue lines in Figure 6-27.

These road links have been identified as experiencing traffic volumes above the additional traffic threshold and therefore require further analysis. The road links and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6-43:

Table 6-43: Road Links where the 100 Flow Additional Threshold is Exceeded (2028, AM Peak Hour)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference (PCU)
LAKESHORE DRIVE	78	183	105
RENMORE PARK	167	367	200
WOODLANDS AVENUE	78	183	105

The table above outlines the additional traffic on the key road links varies between 105 and 200 combined flows during the AM Peak Hour. Further junction capacity assessment has been undertaken along these road links to determine whether the above road links have the capacity to cater for the additional traffic volumes as a result of the Proposed Development.

Operational capacity outputs have been extracted from the LAM at the associated junctions along the subject road links to determine whether there is reserve capacity to facilitate the uplift in traffic. The results are presented in terms of the significance of the impact to the V / C ratio for each junction based on its sensitivity and magnitude of impact.

It should be noted that the worst performing arm of the junction has been used for the purpose of the assessment to ensure a conservative impact assessment is undertaken.

6.5.8.4.4 National Roads – 5% Threshold Impact Assessment (AM Peak Hour)

On the basis of the assessment methodology specifically for national roads, whereby traffic exceeding 5% of the combined turning flows at junctions on or with national roads as a result of traffic redistribution associated with the Proposed Development, the junctions and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6-44: .

Table 6-44: National Road Links where the 5% Additional Traffic Threshold is Exceeded (AM Peak Hour)

Junction	Total Do Minimum Turning Flows (PCU)	Total Do Something Turning Flows (PCU)	Turning Flow Difference (PCU)	Percentage Difference
N6 Headford Road Shopping Centre Junction	4084	4084	0	0.0%
N6 Headford Road Junction	2984	3007	23	0.8%
N6 Tuam Road Junction	2983	3048	66	2.2%
Ballybrit Business Park Junction	3597	3599	1	0.0%
N6 Briarhill Junction	4204	4228	24	0.6%
Coolagh Roundabout	2709	2756	46	1.7%

Junction	Total Do Minimum Turning Flows (PCU)	Total Do Something Turning Flows (PCU)	Turning Flow Difference (PCU)	Percentage Difference
Upgraded Martin Roundabout	1517	1558	41	2.7%

The contents of Table 6-45 demonstrate that the redistributed traffic from the Proposed Development will have a less than 5% impact on turning flows at all junctions along the N6 (between the Coolagh roundabout and the Quincentenary Bridge) and N67. The biggest increase observed is at the upgraded Martin roundabout junction, which sees a 2.7% increase in the AM peak, in the opening year.

6.5.8.4.5 General Traffic Flow Difference – PM Peak Hour

Figure 6-28: illustrates the difference in traffic flows on the road links in the PM Peak Hour for the 2028 Opening Year. Please see Volume 4 - Appendix 6.2 (Impact Assessments) of this EIAR for the full LAM outputs.

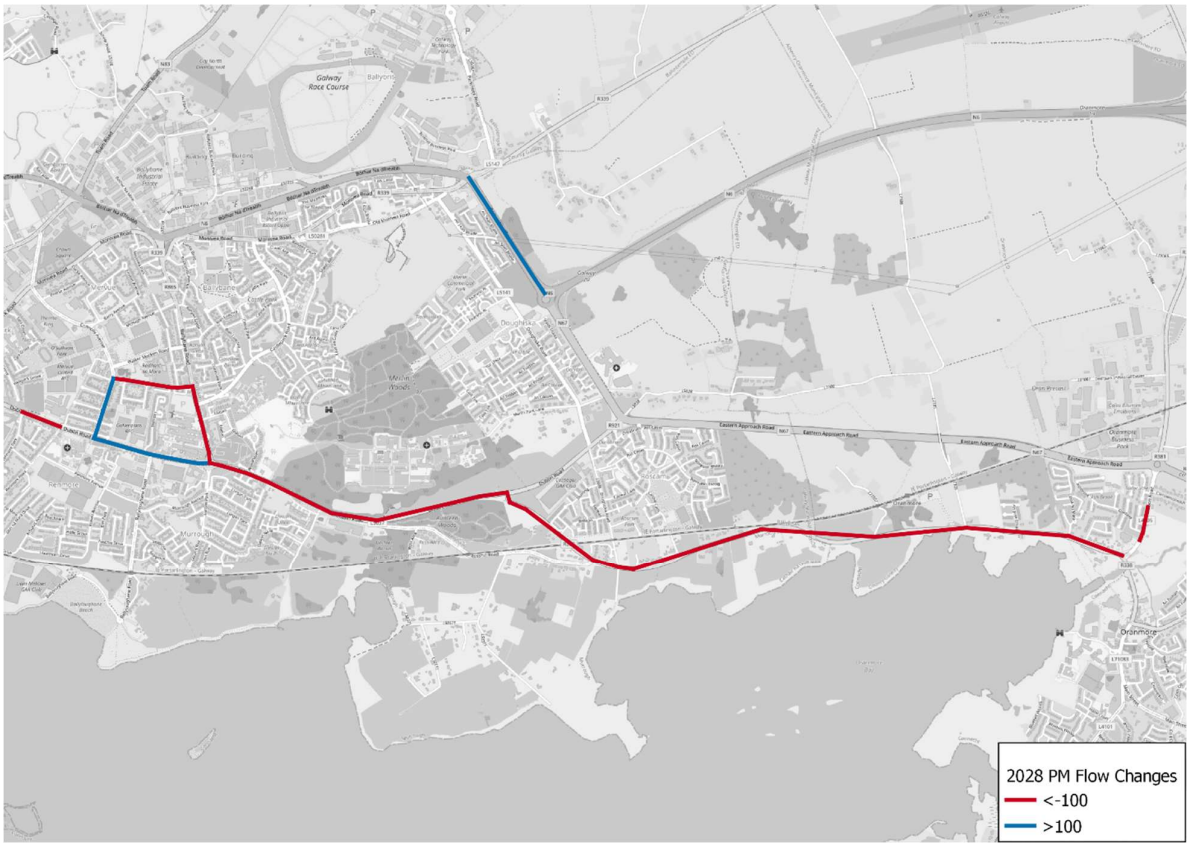

Figure 6-28: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak Hour, 2028 Opening Year

Reductions in General Traffic: The LAM indicates that, during the 2028 Opening Year scenario, there are reductions in general traffic noted along the Proposed Development during the AM Peak Hour, as illustrated by the red lines which indicate where a reduction of at least -100 combined traffic flows occurs.

The key reductions in traffic flows during the AM Peak Hour are outlined in Table 6-45.

Table 6-45: Road Links that Experience a Reduction of ≥100 Combined Flows (PM Peak Hour, 2028)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference (PCU)
BALLYBANE ROAD	1,052	774	-279
COAST ROAD	897	731	-165
DUBLIN ROAD (EAST)	1,838	1,538	-300
ST JAMES ROAD	463	299	-164
STATION ROAD	1,044	934	-110

The contents of Table 6-45 demonstrate that there is a reduction of between -110 and -300 general traffic flows along the direct study area during the PM Peak Hour, which is attributed to the Proposed Development and the associated modal shift as a result of its implementation. This reduction in general traffic flow averages at -203 across all road links, which is determined as an overall **Positive, Slight and Long-term effect** on the direct study area, in accordance with Table 6-41. The most significant effect occurs on the Dublin Road, which is the main corridor of the Proposed Development.

Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the blue lines in Figure 6-28. These road links have been identified as experiencing traffic volumes above the additional traffic threshold and therefore require further analysis. The road links and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6-46:

Table 6-46: Road Links where the 100 Flow Additional Threshold is Exceeded (2028, PM Peak Hour)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference (PCU)
DUBLIN ROAD (WEST)	1,332	1,453	120
MICHAEL COLLINS ROAD	422	612	190
N6	1,749	1,852	103

The table above outlines the additional traffic on the key road links varies between 103 and 190 combined flows during the AM Peak Hour. Further junction capacity assessment has been undertaken along these road links to determine whether the above road links have the capacity to cater for the additional traffic volumes as a result of the Proposed Development.

Operational capacity outputs have been extracted from the LAM at the associated junctions along the subject road links to determine whether there is reserve capacity to facilitate the uplift in traffic. The results are presented in terms of the significance of the impact to the V / C ratio for each junction based on its sensitivity and magnitude of impact.

It should be noted that the worst performing arm of the junction has been used for the purpose of the assessment to ensure a conservative impact assessment is undertaken.

6.5.8.4.6 National Roads – 5% Threshold Impact Assessment (PM Peak Hour)

On the basis of the assessment methodology specifically for national roads, whereby traffic exceeding 5% of the combined turning flows at junctions on or with national roads as a result of traffic redistribution associated with the Proposed Development, the junctions and associated flow difference between the Do Minimum and Do Something scenarios during the PM Peak Hour are outlined in Table 6-47:

Table 6-47: National Road Links where the 5% Additional Traffic Threshold is Exceeded (PM Peak Hour)

Junction	Total Do Minimum Turning Flows (PCU)	Total Do Something Turning Flows (PCU)	Turning Flow Difference (PCU)	Percentage Difference
N6 Headford Road Shopping Centre Junction	4477	4423	-54	-1.2%
N6 Headford Road Junction	3052	3069	17	0.6%
N6 Tuam Road Junction	3308	3251	-57	-1.7%
Ballybrit Business Park Junction	3518	3536	18	0.5%
N6 Briarhill Junction	4717	4845	129	2.7%
Coolagh Roundabout	3575	3622	47	1.3%
Upgraded Martin Roundabout	2359	2416	57	2.4%

The contents of Table 6-47 demonstrate that the redistributed traffic from the Proposed Development will have a less than 5% impact on turning flows at all junctions along the N6 (between the Coolagh roundabout and the Quincentenary Bridge) and N67. The biggest increase observed is at the N6 Briarhill junction, which sees a 2.7% increase in the AM peak, in the opening year.

6.5.8.4.7 General Traffic Impact Assessment Methodology

Following the above threshold assessment, the following three-step approach has been undertaken to determine the impact and Significance of Effect as a result of the redistributed general traffic associated with the Proposed Development:

Step 1 - Determination of Junction Sensitivity: Where road links experience additional traffic volumes of above the proposed thresholds, a review has been undertaken of its associated junctions using the following categories:

- **High Sensitivity (Category 5)** – Roads that cater for a lower volume of traffic than Category 4 with a lower speed limit (30km/h);
- **Medium Sensitivity (Category 4)** – Roads that can cater for a high volume of traffic with a moderate speed limit (30km/h – 50km/h), connecting neighbourhoods;
- **Low Sensitivity (Category 3)** – Roads that interconnect Category 2 type roads with a lower level of mobility than national roads; and
- **Negligible Sensitivity (Category 1 and Category 2)** – Roads that can cater for a high volume of traffic with a high speed limit (100km/h - 120km/h), between major metropolitan cities, i.e. national primary and secondary roads.

The above sensitivities / categories establish the characteristics of the surrounding road network impacted by the Proposed Development. The road link characteristics of the major arm of a junction has been used to determine the junction sensitivity. This has allowed for the identification of where more sensitive locations, in particular Category 5 roads / junctions, are impacted.

Step 2 – Determination of the Magnitude of Impact using Junction Analysis: To understand the magnitude impact of the redistributed traffic, operational capacities have been extracted from the LAM.

The capacity of junctions within the LAM are expressed in terms of Volume to Capacity ratios (V / C ratios). The V / C ratios represent the operational efficiency for each arm of a junction. For the purpose of this EIAR,

operational capacity outputs of a junction have been identified with reference to the busiest arm which experiences the maximum V/C ratio.

A V / C ratio of below 85% indicates that a junction is operating well, with spare capacity, with traffic not experiencing queuing or delays throughout the hour. A value of 85% to 100% indicates that the junction is approaching its theoretical capacity with traffic possibly experiencing occasional queues and delays within the hour. A value of over 100% indicates that a junction is operating above its theoretical capacity and traffic experiences queues and delays regularly within the hour. The junctions have been described in the ranges outlined in Table 6-48: .

Table 6-48: Junction Volume / Capacity Ranges

V/C Ratio	Traffic Condition
≤85%	A junction is operating well within theoretical capacity.
85% - 100%	A junction is approaching theoretical capacity and may experience occasional queues and delays within the hour.
≥100%	A junction is operating above its theoretical capacity and experiences queues and delays quite regularly within the hour.

When comparing the V / C ratios during the Do Minimum and Do Something scenarios for the key junctions, the terms outlined in Table 6-49: have been used to describe the impact.

Table 6-49: Magnitude of Impact for Redistributed Traffic

		Do Something		
		≤85%	85% - 100%	>100%
Do Minimum	≤85%	Negligible	Low Negative	High Negative
	85% - 100%	Low Positive	Negligible	Medium Negative
	>100%	Medium Positive	Low Positive	Negligible

The changes in V / C ratios between the Do Minimum and Do Something scenarios result in either a positive, negative, or neutral magnitude of impact.

Step 3 – Determination of Significance of Effects: The magnitude of impact has been combined with the sensitivity of the road link to determine the Significance of Effect using the matrix shown in Table 6-4 which is based upon the EPA Guidelines on EIAR. The significance of effect has been assigned as positive or negative in instances where the effect is Slight or higher.

Potential mitigation measures have been considered at junctions where the Significance of Effect is predicted to be Significant or higher. At junctions where a moderate effect or lower is predicted, further consideration has not been undertaken as moderate effects represent that which effects the 'character of the environment in a manner that is consistent with existing and emerging baseline trends' (as per Table 6-5).

The above analysis was carried out on the following scenarios:

- 2028 Opening Year – Do Minimum vs Do Something – AM Peak Hour;
- 2043 Design Year (Opening Year + 15 Years) – Do Minimum vs Do Something – AM Peak Hour;
- 2028 Opening Year – Do Minimum vs Do Something – PM Peak Hour; and
- 2043 Design Year (Opening Year + 15 Years) – Do Minimum vs Do Something – PM Peak Hour.

The AM and PM Peak Hour flows are modelled as occurring between 08:00 to 09:00 and 17:00 to 18:00 respectively. The interpeak periods have not been analysed for this impact assessment as the AM and PM Peak Hour flows present an overall worst-case scenario.

6.5.8.4.8 General Traffic Impact Assessment (2028, AM Peak Period)

The contents of Table 6-50: outline the V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2028 Opening Year and the resultant magnitude of impact and significance of effect at each junction.

Table 6-50: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), AM Peak, 2028

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
LAKESHORE DRIVE / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE ROAD / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
LAKESHORE DRIVE / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 1	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 2	High	✓			✓			Negligible	Not Significant
DUBLIN ROAD / RENMORE PARK	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / BELMONT	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / REMORE ROAD	Low		✓				✓	Medium	Negative Moderate
MICHAEL COLLINS ROAD / SAINT JAMES ROAD	Medium	✓			✓			Negligible	Not Significant
DUBLIN ROAD / BALLYLOUGHANE ROAD	Low	✓			✓			Negligible	Not Significant
BALLYBRIT SHOPPING CENTRE JUNCTION	Negligible			✓			✓	Negligible	Imperceptible

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
DUBLIN ROAD / MICHAEL COLLINS ROAD	Low		✓				✓	Medium	Negative Moderate
MARTIN ROUNDABOUT (UPGRADED)	Negligible	✓			✓			Negligible	Imperceptible
SKERRITT ROUNDABOUT (DUBLIN ROAD)	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / MERLIN PARK	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / ROSSHILL ROAD	Low	✓				✓		Low	Negative Slight
DUBLIN ROAD / COAST ROAD	Low		✓			✓		Negligible	Not Significant
DUBLIN ROAD / DOUGHISKA ROAD	Low			✓			✓	Negligible	Not Significant
COOLAGH ROUNDABOUT	Negligible		✓			✓		Negligible	Imperceptible
DUBLIN ROAD / COLLEGE ROAD	Low			✓			✓	Negligible	Not Significant

The results of the junction analysis illustrated in Table 6-50 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the AM Peak Hour in the 2028 Opening Year, and that the Proposed Development will have a negligible impact on the majority of assessed local / regional road links within the indirect study area.

Capacity issues are noted at the following junctions:

- **Ballybrit Shopping Centre Junction (on the N6)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Skerritt Roundabout (Upgraded to Signalised Junction in DS scenario)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Merlin Park** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Doughiska Road** – operates above 100% during both the Do Minimum and Do Something scenarios; and
- **Dublin Road / College Road** – operates above 100% during both the Do Minimum and Do Something scenarios.

The junctions listed above operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios, therefore, the impact is considered to be negligible with a Not Significant and Long-term effect.

Capacity issues are also noted at the following junctions:

- **Dublin Road / Michael Collins Road** – operates between 85% and 100% in the Do Minimum and above 100% during the Do Something scenario;

Combining the road sensitivity with the magnitude of impact determines that the significance of effects of the redistributed traffic as a result of the Proposed Development at the remaining junctions results in a **Not Significant and Long-term effect** at 15 junctions and **Imperceptible and Long-term** at three junctions. At one junction, a **Negative, Slight and Long-term** effect is predicted. At two junctions a **Negative, Moderate and Long-term effect** is predicted. Further assessment into mitigation measures is therefore not considered necessary for any junctions in the AM Peak Hour of the 2028 Opening Year.

6.5.8.4.9 General Traffic Impact Assessment (2028, PM Peak Period)

The contents of Table 6-51: outline the V / C ratios at the key local / regional road junctions in the PM Peak Hour for the 2028 Opening Year and the resultant magnitude of impact and significance of effect at each junction.

Table 6-51: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), PM Peak, 2028

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
LAKESHORE DRIVE / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE ROAD / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
LAKESHORE DRIVE / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 1	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 2	High	✓			✓			Negligible	Not Significant
DUBLIN ROAD / RENMORE PARK	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / BELMONT	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / REMORE ROAD	Low			✓			✓	Negligible	Not Significant
MICHAEL COLLINS ROAD / SAINT JAMES ROAD	Medium	✓			✓			Negligible	Not Significant

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
DUBLIN ROAD / BALLYLOUGHANE ROAD	Low	✓			✓			Negligible	Not Significant
COOLAGH ROUNDABOUT	Negligible	✓			✓			Negligible	Imperceptible
BALLYBRIT SHOPPING CENTRE JUNCTION	Negligible			✓			✓	Negligible	Imperceptible
DUBLIN ROAD / MICHAEL COLLINS ROAD	Low	✓				✓		Low	Negative Slight
MARTIN ROUNDABOUT (UPGRADED)	Negligible	✓			✓			Negligible	Imperceptible
SKERRITT ROUNDABOUT (DUBLIN ROAD)	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / MERLIN PARK	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / ROSSHILL ROAD	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / COAST ROAD	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / DOUGHISKA ROAD	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / COLLEGE ROAD	Low			✓			✓	Negligible	Not Significant

The results of the junction analysis illustrated in Table 6-51 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the PM Peak Hour in the 2028 Opening Year, and that the Proposed Development will have a negligible impact on the majority of assessed local / regional road links within the indirect study area.

Capacity issues are noted at the following junctions:

- **Ballybrit Shopping Centre Junction (on the N6)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Skerrit Roundabout (Upgraded to Signalised Junction in DS scenario)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Renmore Road** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Doughiska Road** – operates above 100% during both the Do Minimum and Do Something scenarios; and

- **Dublin Road / College Road** – operates above 100% during both the Do Minimum and Do Something scenarios.

The junctions listed above operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios, therefore, the impact is considered to be negligible with a Not Significant and Long-term effect.

Combining the road sensitivity with the magnitude of impact determines that the significance of effects of the redistributed traffic as a result of the Proposed Development at the remaining junctions, results in a **Not Significant and Long-term** effect at 17 junctions and **Imperceptible and Long-term** at three junctions. At one junction, a **Negative, Slight and Long-term effect** is predicted. Further assessment into mitigation measures is therefore not considered necessary for any junctions in the PM Peak Hour of the 2028 Opening Year.

6.5.8.4.10 General Traffic Impact Assessment (2043, AM Peak Period)

The contents of Table 6-52: outline the V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2043 Design Year and the resultant magnitude of impact and significance of effect at each junction.

Table 6-52: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), AM Peak, 2043

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
LAKESHORE DRIVE / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE ROAD / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
LAKESHORE DRIVE / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 1	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 2	High	✓			✓			Negligible	Not Significant
DUBLIN ROAD / RENMORE PARK	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / BELMONT	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / REMORE ROAD	Low		✓				✓	Medium	Negative Moderate

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
MICHAEL COLLINS ROAD / SAINT JAMES ROAD	Medium	✓			✓			Negligible	Not Significant
DUBLIN ROAD / BALLYLOUGHANE ROAD	Low	✓			✓			Negligible	Not Significant
BALLYBRIT SHOPPING CENTRE JUNCTION	Negligible			✓			✓	Negligible	Imperceptible
DUBLIN ROAD / MICHAEL COLLINS ROAD	Low		✓				✓	Medium	Negative Moderate
MARTIN ROUNDABOUT (UPGRADED)	Negligible	✓					✓	High	Negative Slight
SKERRITT ROUNDABOUT (DUBLIN ROAD)	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / MERLIN PARK	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / ROSSHILL ROAD	Low	✓				✓		Low	Negative Slight
DUBLIN ROAD / COAST ROAD	Low		✓				✓	Medium	Negative Moderate
DUBLIN ROAD / DOUGHISKA ROAD	Low			✓			✓	Negligible	Not Significant
COOLAGH ROUNDABOUT	Negligible			✓			✓	Negligible	Imperceptible
DUBLIN ROAD / COLLEGE ROAD	Low			✓			✓	Negligible	Not Significant

The results of the junction analysis illustrated in Table 6-52 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the AM Peak Hour in the 2043 Design Year, and that the Proposed Development will have a negligible impact on the majority of assessed local / regional road links within the indirect study area.

Capacity issues are noted at the following junctions:

- **Ballybrit Shopping Centre Junction (on the N6)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Skerrit Roundabout (Upgraded to Signalised Junction in DS scenario)** – operates above 100% during both the Do Minimum and Do Something scenarios;

- **Dublin Road / Merlin Park** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Doughiska Road** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / College Road** – operates above 100% during both the Do Minimum and Do Something scenarios; and
- **Coolagh Roundabout** – operates above 100% during both the Do Minimum and Do Something scenarios.

The junctions listed above operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios, therefore, the impact is considered to be negligible with a Not Significant and Long-term effect.

Capacity issues are also noted at the following junctions:

- **Dublin Road / Michael Collins Road** – operates between 85% and 100% in the Do Minimum and above 100% during the Do Something scenario;
- **Dublin Road / Renmore Road** – operates between 85% and 100% in the Do Minimum and above 100% during the Do Something scenario;
- **Dublin Road / Coast Road** – operates between 85% and 100% in the Do Minimum and above 100% during the Do Something scenario; and
- **Martin Roundabout Junction (Upgraded to Signalised Junction in both scenarios)** – operates below 85% in the Do Minimum and above 100% during the Do Something scenario.

Combining the road sensitivity with the magnitude of impact determines that the significance of effects of the redistributed traffic as a result of the Proposed Development at the remaining junctions results in a **Not Significant and Long-term** effect at 14 junctions and **Imperceptible and Long-term** at two junctions. At two junctions, a **Negative, Slight and Long-term** effect is predicted. At three junctions a **Negative, Moderate and Long-term effect** is predicted. Further assessment into mitigation measures is therefore not considered necessary for any junctions in the AM Peak Hour of the 2043 Design Year.

6.5.8.4.11 General Traffic Impact Assessment (2043, PM Peak Period)

The contents of Table 6-53: outline the V / C ratios at the key local / regional road junctions in the PM Peak Hour for the 2043 Design Year and the resultant magnitude of impact and significance of effect at each junction.

Table 6-53: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), PM Peak, 2043

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
LAKESHORE DRIVE / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE ROAD / LOUGH ATALIA AVENUE	High	✓			✓			Negligible	Not Significant
LAKESHORE DRIVE / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
RENMORE PARK / WOODLANDS AVENUE	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 1	High	✓			✓			Negligible	Not Significant
RENMORE PARK / RENMORE PARK 2	High	✓			✓			Negligible	Not Significant
DUBLIN ROAD / RENMORE PARK	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / BELMONT	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / REMORE ROAD	Low			✓			✓	Negligible	Not Significant
MICHAEL COLLINS ROAD / SAINT JAMES ROAD	Medium	✓			✓			Negligible	Not Significant
SKERRITT ROUNDABOUT (DUBLIN ROAD)	Low			✓			✓	Negligible	Not Significant
DUBLIN ROAD / BALLYLOUGHANE ROAD	Low	✓			✓			Negligible	Not Significant
BALLYBRIT SHOPPING CENTRE JUNCTION	Negligible			✓			✓	Negligible	Imperceptible
DUBLIN ROAD / MICHAEL COLLINS ROAD	Low		✓			✓		Negligible	Not Significant
MARTIN ROUNDABOUT (UPGRADED)	Negligible			✓			✓	Negligible	Imperceptible
DUBLIN ROAD / MERLIN PARK	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / ROSSHILL ROAD	Low	✓			✓			Negligible	Not Significant
DUBLIN ROAD / COAST ROAD	Low		✓		✓			Negligible	Not Significant
DUBLIN ROAD / DOUGHISKA ROAD	Low			✓			✓	Negligible	Not Significant

Junction Name	Junction Sensitivity	DM Max V/C Ratio			DS Max V/C Ratio			Magnitude of Impact	Significance of Effects
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%		
COOLAGH ROUNDABOUT	Negligible		✓			✓		Negligible	Imperceptible
DUBLIN ROAD / COLLEGE ROAD	Low			✓			✓	Negligible	Not Significant

The results of the junction analysis illustrated in Table 6-53 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the AM Peak Hour in the 2028 Opening Year, and that the Proposed Development will have a negligible impact on the majority of assessed local / regional road links within the indirect study area.

Capacity issues are noted at the following junctions:

- **Ballybrit Shopping Centre Junction (on the N6)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Skerrit Roundabout (Upgraded to Signalised Junction in DS scenario)** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Renmore Road** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / Doughiska Road** – operates above 100% during both the Do Minimum and Do Something scenarios;
- **Dublin Road / College Road** – operates above 100% during both the Do Minimum and Do Something scenarios; and
- **Martin Roundabout Junction (Upgraded to Signalised Junction in both scenarios)** – operates above 100% during both the Do Minimum and Do Something scenarios.

The junctions listed above operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios, therefore, the impact is considered to be **negligible with a Not Significant and Long-term effect.**

Combining the road sensitivity with the magnitude of impact determines that the significance of effects of the redistributed traffic as a result of the Proposed Development at the remaining junctions results in a **Not Significant and Long-term effect** at 18 junctions and **Imperceptible and Long-term** at three junctions. Further assessment into mitigation measures is therefore not considered necessary for any junctions in the AM Peak Hour of the 2043 Design Year.

6.6 Mitigation and Monitoring Measures

6.6.1 Construction Phase

Chapter 5 (Construction) of this EIAR has been prepared to demonstrate the likely approach that will be taken to construct the Proposed Development, while it also provides an overview of the construction activities necessary to undertake the works, including information on proposed Construction Compounds, construction plant and equipment.

A Construction Environmental Management Plan (CEMP) has been prepared and is included as Appendix A5.1 in Volume 4 of this EIAR. The CEMP will be implemented (and developed further as required) by the appointed contractor prior to construction commencing. The CEMP comprises the construction mitigation measures, which are set out in this EIAR, and will be updated with any additional measures which may be

required by the conditions attached to An Bord Pleanála's decision. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum during the Construction Phase. 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). All of the content provided in this CEMP will be implemented in full by the appointed contractor and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in this EIAR.

A detailed Construction Traffic Management Plan has been prepared and will subsequently be updated by the appointed contractor prior to construction, including Temporary Traffic Management arrangements prepared in accordance with Chapter 8 Temporary Traffic Measures and Signs for Roadworks of the Traffic Signs Manual.

The CTMP was consulted upon with Galway City Council and includes measures to minimise the impacts associated with the Construction Phase upon the peak periods of the day. It will include imbedded mitigation measures which will assist to alleviate any negative impact as a result of the Construction Phase of the Proposed Development. The appointed contractor will also prepare and include in the CEMP a Construction Stage Mobility Management Plan (CSMMP) which will be developed prior to construction, as described in the CEMP, to actively encourage its personnel to travel to site by sustainable means.

No further mitigation measures are therefore required to be considered as part of the Proposed Development.

6.6.2 Operational Phase

Given that the Proposed Development results in a positive impact for walking, cycling, bus and people movements, mitigation and monitoring measures have not been considered for these assessments.

The design development for general traffic and parking / loading, including the measures incorporated into the Proposed Development to minimise negative impacts, have been outlined in Chapter 4 (Proposed Development Description) of this EIAR. Therefore, no Negative, Significant and Temporary or Long-term effects are predicted as a result of the Proposed Development.

As such, no mitigation measures are required to be considered as part of the Proposed Development.

6.7 Residual Impacts

With the implementation of the imbedded mitigation measures which have been included as part of the Proposed Development, there will be no residual impacts associated with the assessment topics outlined in Section 6.5.

6.8 References

Department of Transport (2019). Traffic Management Guidelines.

Department of Transport (2019). Traffic Signs Manual, as updated.

Department of Transport, Tourism and Sport (2019). Temporary Traffic Measures and Signs for Roadworks.

Department of Transport, Tourism and Sport and Department of Housing, Planning and Local Government (2019). Design Manual for Urban Roads and Streets

Department of the Environment, Climate and Communications (2018). Sustainable Development Goals National Implementation Plan 2018-2020.

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EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

NAVTEQ (2011). The NavStreets Reference Manual.

NTA (2023). Cycle Design Manual

NTA (2013). Greater Dublin Area Cycle Network Plan.

NTA (2016). Transport Strategy for the Greater Dublin Area (2016 – 2035)

TRB (7th edition, 2022) Highway Capacity Manual.

TRB (3rd edition, 2013) Transit Capacity and Quality of Service Manual.

Transport for London (2021, version 4) Traffic Modelling Guidelines.

TII (2014) Traffic and Transport Assessment Guidelines.

Galway City Council Public Realm Strategy (2019)

Ireland's Road Haulage Strategy 2022–2031 (Department of Transport, 2022)