Chapter 06
Traffic & Transport

Contents

6. Traffic & 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 Liffey Valley to City Centre Core Bus Corridor Scheme (hereafter referred to as the Proposed Scheme).

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. To accompany this Chapter, a Transport Impact Assessment (TIA) has been prepared. The TIA presents a comprehensive review of the traffic and transport impacts associated with the Proposed Scheme, which has informed the production of this EIAR Traffic & Transport Chapter. The TIA should be read in conjunction with this EIAR Chapter and is included as Appendix A6.1 (Transport Impact Assessment Report) in Volume 4 of this EIAR.

The Proposed Scheme, as described in detail in Chapter 4 (Proposed Scheme Description) will tie in in with the new Liffey Valley Shopping Centre Bus Interchange and Road Improvement Scheme. The Proposed Scheme will continue along Fonthill Road where it will turn left onto Coldcut Road and continue to the bridge over the M50, subsequently turning right onto Ballyfermot Road. The Proposed Scheme will travel through Ballyfermot Village and continue onto Sarsfield Road, whilst city bound general traffic will be diverted via Le Fanu Road and Kylemore Road.

The Proposed Scheme will continue along Sarsfield Road, turning right at the junction with Con Colbert Road before turning left again onto Grattan Crescent. The Proposed Scheme will then turn left onto Emmet Road and will continue along Old Kilmainham, Mount Brown, James's Street and Thomas Street. At Cornmarket, the Proposed Scheme will turn right onto High Street. At the junction with Nicholas Street and Winetavern Street the Proposed Scheme will tie into the existing traffic management regime in the City Centre.

The Proposed Scheme comprises the development of bus priority along the entire route, from Fonthill Road to High Street / Nicholas Street Junction. The design consists primarily of dedicated bus lanes in both directions where feasible, with alternative measures proposed, such as bus gates, at particularly constrained locations. Significant changes to pedestrian and cycle facilities and traffic management are also proposed as part of the Proposed Scheme.

The contents of Table 6.1 summarises the changes which will be made to the existing transport environment along the corridor as a result of the Proposed Scheme.

Table 6.1: Summary of Changes as a Result of the Proposed Scheme

Total Length of Proposed Scheme	9.2km	
Bus Priority	**Existing (km)**	**Proposed Scheme (km)**
Bus Lanes		
Inbound	2.3	6.5
Outbound	1.9	5.9
Bus Priority through Traffic Management		
Inbound	0	2.7
Outbound	0	3.3
Total Bus Priority (both directions)	4.2	18.4 (+338%)
Bus Measures		
Proportion of Route with Bus Priority Measures	22%	100%
Cycle Facilities – Segregated		
Inbound	1.4	6.4
Outbound	0.8	6.4
Cyclist Facilities – Non-segregated		
Inbound	2.9	0
Outbound	2.6	0.5
Cyclist Facilities – Overall		
Total Cyclist Facilities (both directions)	7.7	13.3 (+73%)
Proportion Segregated (including Quiet Street Treatment)	12%	72%
Other Features		
Number of Traffic Signal Controlled Junctions	23	27
Number of Signal Crossings	71	102

The Proposed Scheme, as described in Chapter 4 (Proposed Scheme Description) is supported by a series of drawings, which are contained in Volume 3 of the EIAR. The following drawings (listed in Table 6.2) should be read in conjunction with this Chapter.

Table 6.2: List of Drawings

Drawing Series Number	Description
BCIDA-ACM-GEO_GA-0007_XX_00-DR-CR-9001	General Arrangement
BCIDA-ACM-GEO_CS-0007_XX_00-DR-CR-9001	Typical Cross Sections
BCIDA-ACM-TSM_GA-0007_XX_00-DR-CR-9001	Traffic Signs and Road Markings
BCIDA-ACM-TSM_SJ-0007_XX_00-DR-TR-9001	Junction System Design

Cumulative impacts of Traffic and Transport, along with other topics, can be found in Chapter 21 (Cumulative Impacts & Environmental Interactions) of this EIAR, as well as in Appendix A6.1 (Transport Impact Assessment Report) in Volume 4 of this EIAR.

6.1.1 Aim and Objectives of the Proposed Scheme

The aim of the Proposed Scheme is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the Core Bus Corridor (CBC) Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements;
- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;

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

The planning and design of the Proposed Scheme has been guided by these aims and objectives, with the need for the Proposed Scheme described in detail in Chapter 2 (Need for the Proposed Scheme) 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 Scheme. The aim being the reduction of journey times for higher person carrying capacity modes (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 per vehicle. 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 buses 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 and segregated cycle tracks can significantly benefit these sustainable modes and encourage greater use of these modes.

With regards to this Traffic and Transport Chapter, People Movement is the key design philosophy and the Proposed Scheme impacts (both positive and negative) have been assessed on this basis.

6.1.1.2 Preliminary Design Guidelines

To support the 'People Movement' led approach to the design of the Proposed Scheme, the Preliminary Design Guidance Booklet for BusConnects Core Bus Corridors (PDGB) (National Transport Authority (NTA) 2021) (refer to Appendix A4.1 in Volume 4 of this EIAR) was developed. This guidance document was prepared to ensure that a consistent design approach was taken across the CBC Infrastructure Works and that the objectives of the project are achieved. A 'People Movement' led design involves the prioritisation of people movement, focusing on maximising the throughput of sustainable modes (i.e. walking, cycling and bus modes) in advance of the consideration and management of general vehicular traffic (private car) at junctions.

In support of this approach, a project specific People Movement at Signals Calculator (PMSC) was developed. The PMSC was applied at the initial design development stage, to provide an initial estimate of green time allocation for all movements at a typical junction, on the basis that sustainable mode movements should be accommodated foremost to maximise people movement with the remaining green time allocated to general traffic movements. The calculations were underpinned by:

- The number of buses required to be accommodated along the Proposed Scheme, as per the BusConnects Network Re-design proposals;

- The provision of a high Level of Service for cyclists at each junction along the Proposed Scheme; and
- The pedestrian crossing width and crossing timing requirements based on the provision of a high Level of Service for pedestrians at each junction along the Proposed Scheme.

The outputs of the calculator provided an initial estimate of the green times and vehicle capacity movements based on inputs and assumptions for each junction along the Proposed Scheme. The calculator provided an estimate of the People Movement for the junction in question (by mode) and was used to adjust proposals with a view to maximising the total person throughput at each junction along the Proposed Scheme during the iterative design process, described further below in Section 6.2.3. Details on the development of junction designs along the Proposed Scheme are included in Appendix A6.3 (Junction Design Report) in Volume 4 of this EIAR.

The People Movement Calculation and the identification of available general traffic capacity from this initial exercise was enhanced further by the Proposed Scheme Transport Models described in Section 6.2.3.

6.1.2 Iterative Design Process and Mitigation by Design

Throughout the development of the Preliminary Design for the Proposed Scheme 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 (described in Section 6.2.3) was developed to support this iterative design process.

Diagram 6.1 illustrates the process whereby the emerging design for the Proposed Scheme 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 (e.g. cycle lane widening) 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 scheme objectives along the Proposed Scheme.

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

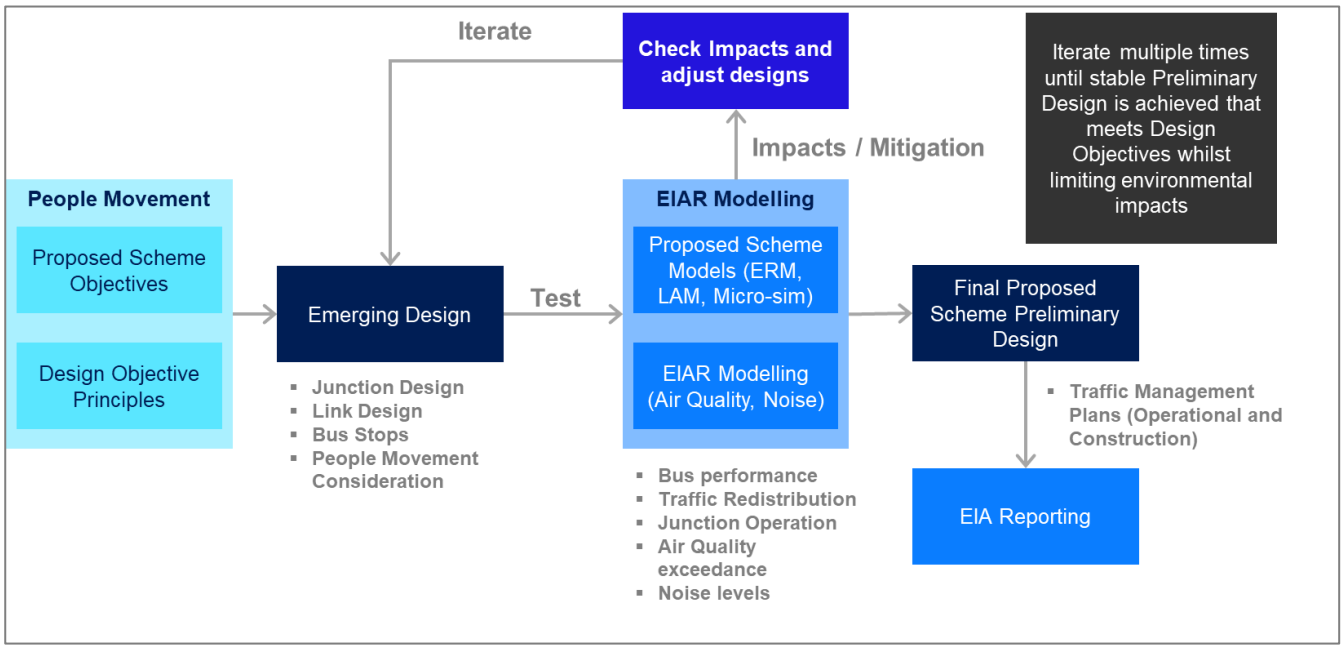


Diagram 6.1 Proposed Scheme Impact Assessment and Design Interaction

The impacts presented in this Chapter are based on the Preliminary Design for the Proposed Scheme which includes the embedded mitigation developed as part of the iterative design process.

6.2 Methodology

The methodology for the traffic and transport related impacts of the Proposed Scheme has incorporated a number of key references and inter-related stages, which are outlined in the following sections.

6.2.1 Study Area

The direct and indirect impacts have been considered with reference to the following study area extents (as shown in Diagram 6.2):

- **Direct Study Area:** The Proposed Scheme (i.e. the transport network within the red line boundary); and
- **Indirect Study Area:** This is the area of influence the Proposed Scheme has on changing traffic volumes above a defined threshold with reference to Transport Infrastructure Ireland's (TII) Traffic and Transport Assessment Guidelines (May 2014) (see Section 6.2.3 for further details on the threshold applied in relation to traffic volume changes used in the definition of the indirect study area).

Diagram 6.2: Proposed Scheme Direct and Indirect Study Area

6.2.2 Relevant Guidelines, Policy and Legislation

The policies and legislation which are applicable to the Traffic & Transport Chapter are detailed in Chapter 2 (Need for the Proposed Scheme) of the EIAR and in Appendix A6.1 (Transport Impact Assessment Report) in Volume 4 of this EIAR. The specific traffic and transport guidelines which have informed this Chapter are detailed in turn.

6.2.2.1 Traffic and Transport Assessment Guidelines

To determine the traffic and transport impact that the Proposed Scheme 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 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 TIA, which supports this EIAR Chapter, follows the Traffic and Transport Assessment Guidelines and offers an impartial description of the likely impacts of the Proposed Scheme, outlining both its positive and negative aspects.

6.2.2.2 Design Manual for Urban Roads and Streets

The Design Manual for Urban Roads and Streets (DMURS) (Department of Transport, Tourism and Sport (DTTAS) 2019) 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 60km/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; and
- Multi-disciplinary Approach – Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

The Proposed Scheme has been designed and assessed with reference to these guidelines.

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

The Traffic Signs Manual (Department of Transport (DoT) 2019) 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.

6.2.2.4 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:

- Environment Improvement;
- Congestion Relief;
- Capacity Improvement;
- Safety;
- Accessibility;
- Economic Vitality; and
- Politics.

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

6.2.3 Proposed Scheme Impact Assessment Modelling Tools

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

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

In summary, there are four tiers of transport modelling which have been used to assess the impacts of the Proposed Scheme:

- **Tier 1 (Strategic Level):** The NTA's East Regional Model (ERM) is the primary tool which has been used to undertake the strategic modelling of the Proposed Scheme and has provided the strategic multi-modal demand outputs for the proposed forecast years;

- **Tier 2 (Local Level):** A Local Area Model (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 ERM and contains a more refined road network model used to provide consistent road-based outputs to inform the TIA, EIA and junction design models. This includes information such as road network speed data and traffic redistribution impacts for the Operational Phase. The LAM also provides traffic flow information for the micro-simulation model and junction design models and has been used to support junction design and traffic management plan testing;
- **Tier 3 (Corridor Level):** A micro-simulation model of the full 'end to end' corridor has been developed for the Proposed Scheme. 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 the determination of benefits of the Proposed Scheme; and
- **Tier 4 (Junction Level):** Local junction models have been developed, for each junction along the Proposed Scheme to support local junction design development. These models are informed by the outputs from the above modelling tiers, as well as the junction designs which are, as discussed above, based on people movement prioritisation.

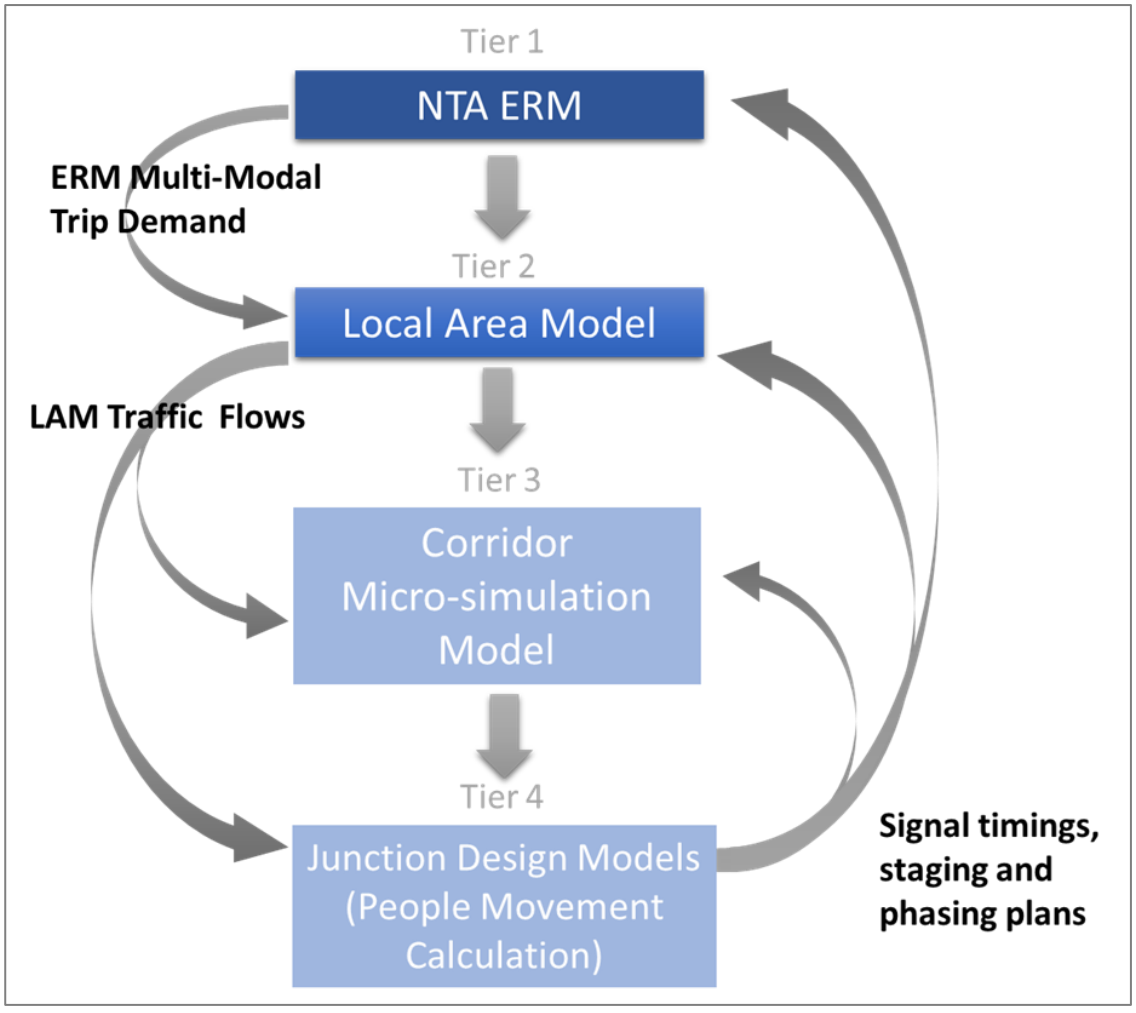


Diagram 6.3: Proposed Scheme Modelling Hierarchy

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 Appendix A6.2 (Transport Modelling Report) and Appendix A6.3 (Junction Design Report) in Volume 4 of this EIAR.

6.2.4 Appraisal Method for the Assessment of Impacts

6.2.4.1 Overview

This section details the methodologies that have been used to assess the potential traffic and transport impacts of the Proposed Scheme 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 Guidelines on the information to be Contained in Environmental Impact Assessment Reports (EPA 2022) and methodologies outlined in the Traffic and Transport Assessment Guidelines (TII 2014), using a Multi-Modal Level of Service (LoS) approach.

6.2.4.2 Outlining the Assessment Topics

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

6.2.4.3 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 Scheme 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 of the direct and indirect study areas **without** the Proposed Scheme in place and other GDA Strategy projects, which has been outlined in Section 6.3 (Baseline Environment). This scenario forms the reference case by which to compare the Proposed Scheme ('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 direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, **without** the Proposed Scheme in place. This scenario forms the reference case by which to compare the Proposed Scheme ('Do Something') for the quantitative assessments. Further detail on the Proposed Scheme and demand assumptions within this scenario are included further below in Section 6.2.3.
- **'Do Something'** – The 'Do Something' scenario represents the likely traffic and transport conditions of the direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, **with** the Proposed Scheme in place (i.e. the Do Minimum scenario with the addition of the Proposed Scheme). The Do Something scenario has been broken into two phases:
    - Construction Phase (Construction Year 2024) – This phase represents the single worst-case period which will occur during the construction of the Proposed Scheme.
    - Operational Phase (Opening Year 2028, Design Year 2043) – This phase represents when the Proposed Scheme is fully operational.

The assessment of changes between the Do Minimum and Do Something scenarios have been presented in either a positive, negative or neutral magnitude of impact as a result of the Proposed Scheme, 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. Refer to Section 6.4 for further information on the methodology in applying these ratings for each assessment.

6.2.4.3.1 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 (TRB 2000). 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 2003).

LoS concepts are not target based or rigid in their application and bespoke versions are developed to suit the particular receiving environment of the scheme under consideration or the particular user problems that the scheme 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 Scheme will provide an easily understandable summary of the impact of each assessment topic, where applied.

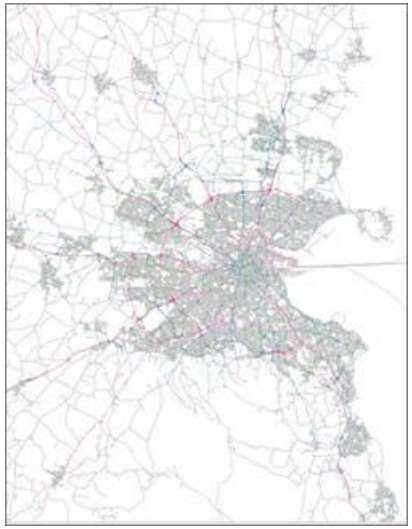
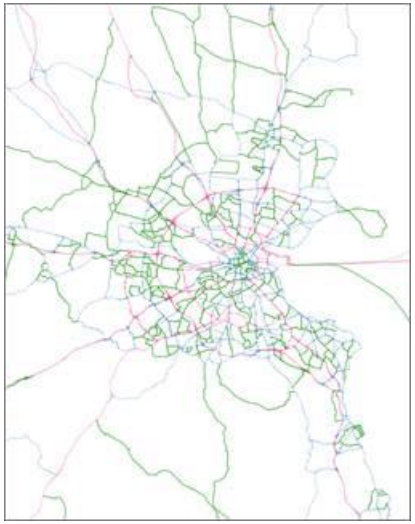
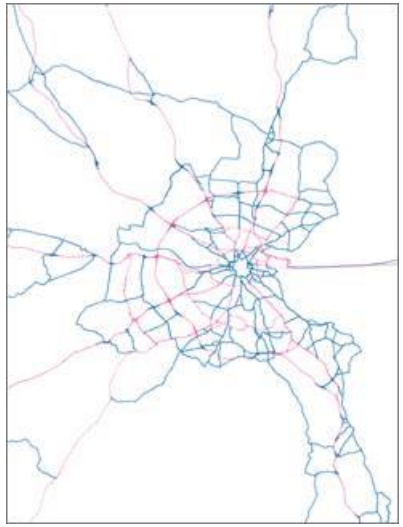
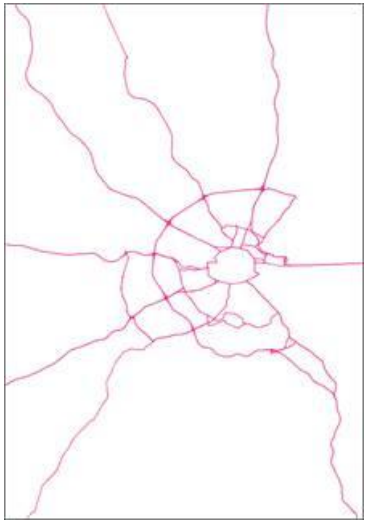
6.2.4.4 Defining the Sensitivity of the Environment

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

- OpenStreet Map – to identify community facilities, and open spaces within 50m of the Proposed Scheme; 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 two sets of sensitivity ratings that have been applied to the impact assessments, depending on whether the assessment location is within the direct or indirect study area.

Table 6.3: BusConnects EIAR Sensitivities

Assessment Area	Sensitivity			
	High	Medium	Low	Negligible
Proposed Scheme / Direct Study Area Sensitivities	Sections of the Proposed Scheme 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 Scheme that currently experience congestion for pedestrians, cyclists, buses or general traffic that have not been identified as high sensitivity	Sections of the Proposed Scheme 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
Indirect Study Area Sensitivities	Category 5: Low capacity, low operating speeds. Local and minor roads. (Shown in grey) 	Category 4: High capacity, moderate operating speeds. Roads connecting between neighbourhoods. (Shown in green) 	Category 3 roads: High capacity, high operating speeds (less than Category 2). Roads connecting Category 2 roads. (Shown in blue) 	Category 1: High capacity, high operating speeds. Roads connecting between major cities or urban areas; and Category 2: Roads connecting Category 1 roads, enabling high capacity through and between cities (Shown in red) 

6.2.4.5 Determining the Significance of Effects

The Significance of Effects rating has been established using Table 6.4, which was derived from Figure 3.4 of the EPA Guidelines on EIARs (EPA 2022). This enables the sensitivities and magnitudes of impact to determine the significance of a particular impact. For example, a section of a Proposed Scheme with a high sensitivity and a long-term medium positive impact would have a predicted 'Positive, Significant and Permanent' impact. A section of a Proposed Scheme with a low sensitivity and a short-term low negative impact would have a predicted 'Negative, Slight and Temporary' impact.

Table 6.4: Significance of Effects Matrix for Traffic and Transport Chapter

		Sensitivity of Existing Environment			
		High	Medium	Low	Negligible
Description Impact	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 Scheme 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 impact of significant or higher (i.e. significant, very significant or profound).

6.2.5 Data Collection and Collation

The assessment of the Traffic and Transport impacts of the Proposed Scheme 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.

6.2.5.1 Qualitative Assessment Data Collection

This Section discusses the data collection undertaken to inform the qualitative assessment metrics set out in Section 6.4.6.2.

6.2.5.1.1 Site Surveys

A walkover of the route of the Proposed Scheme 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 Scheme.

6.2.5.1.2 Mapping Data

Three sources of mapping data have been used to inform the analysis, Ordnance Survey Mapping (OSM), NavStreets and OpenStreet Map.

OSM is created by Ordnance Survey Ireland which provides detailed mapping for a variety of uses. For the Traffic and Transport Chapter, OSM has been used to establish accurate road naming and the location of physical road features.

NavStreets is a street-level GIS dataset which covers the Republic of Ireland, including the Greater Dublin 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.
- 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 Scheme.

6.2.5.2 Quantitative Assessment Data Collection

This Section discusses the data collection undertaken to inform the quantitative assessment metrics set out in Section 6.4.6.3. Further detail can be found in Appendix A6.2 (Transport Modelling Report) in Volume 4 of this EIAR.

6.2.5.2.1 Existing Data Review (Gap Analysis)

A review of existing traffic survey data available for the area of interest was undertaken from the following sources:

- NTA Traffic Count Database: A mixture of Automatic Traffic Counts (ATC) and Junction Turning Counts (JTC) from previous studies covering a range of years; and
- TII Counters: Permanent TII ATCs located on national strategic roads across the network with data publicly available online.

The NTA, Dublin City Council and the other Local Authorities undertake periodic counts within their administrative areas in connection with their own local schemes. These surveys are conducted throughout the year and a limited set of data was available within the area of the Proposed Scheme.

Information on bus passenger volumes was already available and included in the modelling process as part of the ERM base model calibration and validation, which includes the annual canal and M50 cordon counts as well as ticketing data.

6.2.5.2.2 Commissioned Traffic Survey Data

Due to the scale of the CBC Infrastructure Works, the Proposed Scheme required a full set of consistent updated traffic counts for a neutral period e.g. November / February when schools, colleges were in session. Traffic surveys were undertaken in November 2019 and February 2020 (Pre-COVID) with the surveyed counts used as inputs to the model calibration and validation process of the strategic model and micro-simulation model. The two types of counts used in the study are Junction Turning Counts (JTCs) and Automatic Traffic Counts (ATCs).

6.2.5.2.2.1 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 Scheme 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.

6.2.5.2.2.2 Automatic Traffic Counts (ATCs)

The ATC data provides information on:

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

The ATCs were taken for an entire week. A summary of the collected data can be found in Appendix A6.1 (Transport Impact Assessment Report) in Volume 4 of this EIAR.

6.2.5.2.3 Road and Bus Journey Time Data

6.2.5.2.3.1 Bus Journey Time Data

Bus Journey Time data for the Proposed Scheme was provided by the 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 Scheme.

6.2.5.2.3.2 TomTom Road Journey Time Data

Road journey time data for the Proposed Scheme models has been sourced from TomTom, 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 Traffic Stats portal. The NTA has an agreement with TomTom to provide travel time information covering six areas of Ireland and for certain categories of road.

Data is provided based on the area specified by the agreement; however, the date and time range of the data can be specified by the user. For the development of the strategic model and micro-simulation models the following query on the data was applied:

- 2019 weekdays (Monday to Thursday) from mid-January until end of November, excluding all bank holidays and days close to those dates.

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.

6.2.5.2.3.3 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 Scheme route.

6.2.5.2.3.4 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 Appendix A6.2 (Transport Modelling Report) in Volume 4 of this EIAR.

6.3 Baseline Environment

6.3.1 Overview

This section provides an overview of the existing traffic and transport conditions within the redline boundary of the Proposed Scheme. The baseline conditions have been informed by several site visits of the local environment, comprehensive traffic surveys, and a desktop review of the most recent aerial photography.

Overall, cycling infrastructure provision on the corridor currently consists of 47% cycle priority inbound (15% segregated cycle tracks and 32% non-segregated cycle lanes) and 37% cycle priority outbound (9% segregated cycle tracks and 28% non-segregated cycle lanes).

Bus services along the Proposed Scheme currently operate within a constrained and congested environment, with 21% priority outbound and 25% priority inbound on the corridor in the form of bus lanes. An examination of Automatic Vehicle Location (AVL, collected by the NTA) data indicates that the current standard deviation for journey times of buses on the corridor is 12 minutes. With any further increases in traffic levels, these issues are expected to be exacerbated. While impacting upon bus passengers, longer and less reliable bus services also require operators to use additional buses to maintain headways to fill gaps created in the timetable. Aligned to this, the remaining sections of unprioritised bus network can lead to bunching of buses which, in turn, means stops can become overcrowded, creating delays in boarding and alighting and the imbalanced use of bus capacity.

In describing the baseline conditions, the Proposed Scheme has been divided into three sections. These sections are outlined as follows and are illustrated in Figure 6.1, Figure 6.2a and Figure 6.2b in Volume 3 of this EIAR:

- Section 1: Liffey Valley to Le Fanu Road;
- Section 2: Le Fanu Road to Sarsfield Road; and
- Section 3: Sarsfield Road to City Centre

6.3.2 Section 1 – Liffey Valley to Le Fanu Road

This Section of the Chapter outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 1 of the Proposed Scheme, Liffey Valley to Le Fanu Road.

This Section commences at the four-arm Fonthill Road junction, adjacent to McDonald's. The route comprises 2.9km of Fonthill Road, R833 Coldcut Road, and R833 Ballyfermot Road, finishing at R833 Ballyfermot Road / Le Fanu Road Junction.

6.3.2.1 Pedestrian Infrastructure

Footpaths are provided on both sides of the carriageway along Fonthill Road, R833 Coldcut Road and R833 Ballyfermot Road, with the exception of the southern side of the R833 Coldcut Road / Kennelsfort Road Upper / R833 Ballyfermot Road three-arm signalised junction, where the footpath is routed through the adjacent residential road. Street lighting is provided on both sides of the carriageway between Liffey Valley and Le Fanu Road.

The footpaths vary in width along this section of the Proposed Scheme and there are a number of pinch points below the minimum width of 1.8m. For example, the existing footpath tapers into the cycle lane before abruptly merging into a shared surface pedestrian / cycle way across the M50 Motorway at the eastern side of the R833 Coldcut Road / M50 Motorway Bridge.

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

- The four-arm Fonthill Road / Fonthill Road Roundabout has signalised crossings on both the eastern and western arms. Both crossings are staggered with pedestrian refuge islands, which include guard rails, to allow pedestrians to cross in stages;
- The three-arm R833 Coldcut Road / Fonthill Road signalised junction provides crossings on the northern and eastern arms. The northern and eastern arm crossings are staggered due to the slip lanes on the northeastern and northwestern arms; the traffic islands allow pedestrians to cross in stages. The traffic islands do not have guard rails;
- The three-arm R833 Coldcut Road / Cloverhill Road signalised junction provides two crossings on the eastern and southern arms. Both crossings are staggered with pedestrian refuge islands, which include guard rails, to allow pedestrians to cross in stages;
- The three-arm R833 Coldcut Road / R833 Ballyfermot Road / R833 Kennelsfort Road Upper signalised junction provides crossings on the northern and western arms. The crossings are staggered due to slip lanes on the northwestern arms and southwestern arms; the traffic islands allow pedestrians to cross in stages. The crossings do not have guard rails;
- A pelican crossing across R833 Ballyfermot Road, adjacent to C&F Quadrant Ltd. The crossing is staggered with pedestrian refuge islands, which include guard rails, to allow pedestrians to cross in stages;
- The three-arm R833 Ballyfermot Road / Cherry Orchard signalised junction provides direct crossings on the southern and eastern arms arm. Each crossing provides a pedestrian refuge island, which does not have guard rails;
- The three-arm R833 Ballyfermot Road / Cleggan Park Junction provides a direct signalised crossing on the western arm and a raised table on the northern arm;
- The three-arm R833 Ballyfermot Road / R833 Blackditch Drive Junction provides one direct signalised crossing on the western arm with a pedestrian refuge island, which does not have guard rail;
- The three-arm R833 Ballyfermot Road / Clifden Road Junction provides a direct signalised crossing on the southern arm;
- The three-arm R833 Ballyfermot Road / Drumfinn Road Junction provides two direct signalised crossings on the northern and western arm. The western arm has a pedestrian refuge island, which does not have guard rails;
- A pelican crossing across R833 Ballyfermot Road, adjacent to Homesavers Ltd. The crossing provides a direct signalised crossing; and
- The four-arm R833 Ballyfermot Road / Le Fanu Road Junction provides a direct signalised crossing on each arm. Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs.

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The locations of the pedestrian crossings are illustrated in Figure 6.3a in Volume 3 of this EIAR.

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 1 of the Proposed Scheme is included in Appendix A6.4.1 (Pedestrian Infrastructure Assessment).

6.3.2.2 Cycling Infrastructure

Cycle facilities are provided along most of the length of Section 1 of the Proposed Scheme, comprising of cycle tracks, cycle lanes (including advisory lanes), and combined bus and cycle lanes.

Between Liffey Valley Shopping Centre and the R833 Coldcut Road / Fonthill Road Junction, a two-way cycle track exists along the south-western carriageway of Fonthill Road. At the Fonthill Road / Fonthill Road Junction, two-way cycle tracks provide links to the north and north-east of the junction. Shared facilities and toucan crossings are provided at the eastern and western arms of Fonthill Road / Fonthill Road Roundabout.

Along R833 Coldcut Road, eastbound cycling facilities are intermittent. An eastbound combined bus and cycle lane terminates approximately 150m west of the R833 Coldcut Road / Fonthill Road Junction, from here there are no eastbound cycle facilities until approximately 110m east of the M50 Motorway Bridge. At this point, a combined bus and cycle lane commences for approximately 150m. The combined bus and cycle lane is in operation 24 hours a day. As the combined bus and cycle lane terminates, an eastbound cycle track commences and stretches for approximately 140m. Approximately 35m from the approach of the R833 Coldcut Road / R833 Ballyfermot Road / Kennelsfort Road Upper Junction, an eastbound advisory cycle lane (those which general traffic are permitted to enter) is available.

Along R833 Ballyfermot Road, eastbound cycling facilities consist of cycle lanes, combined bus and cycle lanes and cycle tracks. Approximately 20m south of R833 Coldcut Road / R833 Ballyfermot Road / Kennelsfort Road Upper Junction, an advisory eastbound cycle lane merges with a combined bus and cycle lane for approximately 210m. The combined bus and cycle lane is in operation from Monday to Saturday between the hours of 07:00hrs and 19:00hrs. As the bus lane terminates, an advisory cycle lane commences and is available for approximately 340m, of which 250m falls within a combined bus and cycle lane, extending to the east of the R833 Ballyfermot Road / Cherry Orchard Industrial Estate (Lidl) Junction. At this point, the combined bus and cycle lane continues until approximately 60m east of the R833 Ballyfermot Road / Blackditch Road Junction. An eastbound cycle lane / cycle track is available on adjacent service roads and terminates approximately 185m west of the R833 Ballyfermot Road / Le Fanu Road Junction.

Along R833 Ballyfermot Road in the westbound direction, a cycle lane / cycle track is available on adjacent service roads for approximately 680m. The cycle lane / cycle track commences approximately 200m west of the R833 Ballyfermot Road / Le Fanu Road Junction and extends to approximately 20m west of the R833 Ballyfermot Road / Cleggan Park Junction. From here, there is a 60m section where no westbound cycle facilities are available, before an advisory cycle lane commences. The advisory cycle lane extends for approximately 270m, temporarily terminating after 85m before commencing for a further 280m. Approximately 110m on the approach to the Coldcut Road / R833 Ballyfermot Road Junction, westbound cyclists are directed to a cycle track and along a residential service road, prior to joining a cycle lane adjacent to R833 Coldcut Road.

Along R833 Coldcut Road, the cycle track extends from the R833 Coldcut Road / R833 Ballyfermot Road Junction until approximately 60m on the approach to the Cloverhill Road Junction, where it temporarily ceases prior to restarting approximately 80 west of R833 Coldcut Road / Cloverhill Road Junction. Cycle facilities are not provided over the M50 Motorway Bridge. To the west of the bridge a cycle track is available for approximately 100m before merging with a combined bus and cycle lane for the R833 Coldcut Road / Fonthill Road Junction. The combined bus and cycle lane is in operation 24 hours a day. To the west of the R833 Coldcut Road / Fonthill Road Junction, a combined bus and cycle lane is available for westbound cyclists.

Cycle parking stands are provided at the following points within the redline boundary of the Proposed Scheme:

- Three Sheffield stands (able to accommodate 6 bicycles) along R833 Ballyfermot Road westbound carriageway, west of the R833 Ballyfermot Road / Le Fanu Road Junction; and
- Two Sheffield stands (able to accommodate 4 bicycles) along R833 Ballyfermot Road eastbound carriageway, east of the R833 Ballyfermot Road / Le Fanu Road Junction.

Cycle parking stands are provided at the following points in the vicinity of the Proposed Scheme, albeit, outside of the redline boundary:

- Seven Sheffield stands (able to accommodate 14 bicycles) along Le Fanu Road northbound carriageway, outside Ballyfermot Dental Surgery;
- 15 curved steel 'toast rack' cycle stands (able to accommodate 30 bicycles) within the grounds of Cherry Orchard Hospital; and
- Eight Sheffield stands located outside Ballyfermot Primary Care Centre (able to accommodate 16 bicycles).

There is no designated cycle hire scheme parking racks within Section 1 of the Proposed Scheme.

The existing cycle facilities along Section 1 of the Proposed Scheme are illustrated in Figure 6.4a in Volume 3 of this EIAR.

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 1 of the Proposed Scheme is included in Appendix A6.4.2 (Cycling Impact Assessment) in Volume 4 of this EIAR.

6.3.2.3 Bus Infrastructure

6.3.2.3.1 Bus Priority Measures

Bus lanes are provided along Section 1 of the Proposed Scheme at the following locations (aside from intermittent breaks and junctions):

- An eastbound combined bus and cycle lane of approximately 150m in length is located between R833 Coldcut Road / Coldcut Crescent and R833 Coldcut Road / Cloverhill Road
- An eastbound combined bus and cycle lane of approximately 210m in length is located between R833 Coldcut Road / Kennelsfort Road Upper / Ballyfermot Road Junction and Ballyfermot Road / Cherry Orchard Hospital
- An eastbound combined bus and cycle lane of approximately 500m in length is located between the R833 Ballyfermot Road / Cherry Orchard Industrial Estate Junction and 60m east of the R833 Ballyfermot Road / Blackditch Road Junction.

6.3.2.3.2 Bus Stop Facilities

There are currently 15 existing bus stops along Section 1 of the Proposed Scheme. The inbound stops are as follows:

- Stop 2686 on R833 Coldcut Road outside TradePoint;
- Stop 7510 on R833 Coldcut Road to the east of the R833 Coldcut Road / M50 Motorway Bridge;
- Stop 4799 on R833 Ballyfermot Road west of Cherry Orchard Industrial Estate;
- Stop 2205 on R833 Ballyfermot Road west of Cherry Orchard Industrial Estate;
- Stop 2687 on R833 Ballyfermot Road west of Lidl;
- Stop 2688 on R833 Ballyfermot Road adjacent to Blackditch Drive;
- Stop 2689 on R833 Ballyfermot Road west of Ballyfermot Community Civic Centre; and
- Stop 2696 on R833 Ballyfermot Road east of Drumfinn Road.

The outbound stops are:

- Stop 2674 on R833 Coldcut Road outside The Coldcut Club;
- Stop 4798 on R833 Coldcut Road west of R833 Kennelsfort Road Upper;
- Stop 2206 on R833 Ballyfermot Road opposite Cherry Orchard Industrial Estate;
- Stop 2673 on R833 Ballyfermot Road west of Ballyfermot Primary Care Centre;
- Stop 2672 on R833 Ballyfermot Road east of R833 Ballyfermot Road / Blackditch Drive Junction;

- Stop 2688 on R833 Ballyfermot Road west of Ballyfermot Community Civic Centre; and
- Stop 2656 on R833 Ballyfermot Road outside Homesavers Ltd.

Out of the 15 bus stops, one bus stop (stop 4798, Coldcut Road) is located within an indented drop off area. Of the remaining 14 bus stop, the following six stops are situated inline within bus lanes:

- Dublin Bus Sports, stop 2674;
- Ballyfermot Road, stop 4799;
- Cherry Orchard Hospital, stop 2205;
- Cherry Orchard IE, stop 2687;
- Cleggan Park, stop 2688; and
- Ballyfermot, stop 269.

At three bus stops (Cloverhill Road stop 7510, Cherry Orchard Hospital stop 2206, and Cherry Orchard Industrial Estate stop 2673) a pole and timetable are provided, and at one stop (Cherry Orchard Hospital stop 2205) a pole and Real-Time Passenger Information (RTPI) system are provided. All the remaining bus stops provide shelter and seating as a minimum, with the exception of bus stop 4799 which does not provide seating.

The content of Table 6.6 outlines the availability of facilities at the existing 15 bus stops along Section 1 of the Proposed Scheme.

Table 6.6: Section 1 - Availability of Bus Stop Facilities (of a Total 15 Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	4	27%
Timetable Information	13	87%
Shelter	11	73%
Seating	10	67%
Accessible Kerbs	4	27%
Indented Drop Off Area	1	7%

The existing bus facilities along Section 1 of the Proposed Scheme are illustrated in Figure 6.5a in Volume 3 of this EIAR. The bus services which operate along Section 1 are outlined in Table 6.7.

Table 6.7: Section 1 - Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
76	Tallaght (The Square) – Clondalkin Village – Neilstown Road (Coldcut Road) – Ballyfermot - Chapelizod	20 minutes	30 minutes
76a	Tallaght (The Square) – Clondalkin Village – Neilstown Road (Coldcut Road) – Ballyfermot – Chapelizod – Blanchardstown Centre	50 minutes	No Services
26	Merrion Square – O'Connell Bridge – Parkgate Street – Chapelizod - N4 Palmerstown – Liffey Valley Shopping Centre	30 minutes	60 minutes
40	Charlestown Shopping Centre – Finglas Village – St Helena's Road – Dorset Street Lower – Inchicore – Ballyfermot Road – Neilstown Road – Liffey Valley Shopping Centre	10 minutes	30 minutes
18	Sandymount – Ballsbridge – Pembroke Lane – Rathgar – Crumlin Hospital – Long Mile Road – Ballyfermot Road – Kennelsfort Road – Palmerstown Village – Old Lucan Road	20 minutes	30 minutes
79	Aston Quay – St Johns Road – Kylemore Road – Ballyfermot Road	20 minutes	30 minutes
79a	Aston Quay – St Johns Road – Kylemore Road – Ballyfermot Road	20 minutes	30 minutes

6.3.2.4 General Traffic

6.3.2.4.1 Fonthill Road

Within Section 1 of the Proposed Scheme, Fonthill Road is a dual carriageway road with a speed limit of 50km/h. The opposing flows along the two lanes are separated by a grass verge for much of its length. The road is bounded by grass verges, which provides separation to pedestrian routes, behind which are trees, separating the highway from the Liffey Valley Shopping Centre car parks, and fences or further verges which lead towards adjacent dwellings. The roundabout junctions south of the Liffey Valley Shopping Centre and southeast of the Liffey Valley Retail Park have two-lane entries and exits.

There is one existing major junction arrangement along Fonthill Road:

- R833 Coldcut Road / Fonthill Road three arm signalised junction.

R833 Coldcut Road / Fonthill Road three arm signalised junction: This is a three-arm signalised junction with pedestrian crossing facilities along the northern and eastern arms. A grass verge median divides each arm.

The western arm consists of an ahead lane and a non-signalised, left turn slip lane with a yield sign on the approach. The western arm exit consists of two general traffic lanes and a dedicated bus lane. The northern arm consists of a left-turn slip lane and two right-turn lanes on the approach. The northern arm exit consists of two general traffic lanes. The eastern arm consists of a dedicated bus lane of 75m length, an ahead lane and a right-turn lane of 75m length. The eastern arm exit consists of one general traffic lane of 7.5m width.

These characteristics are shown in Image 6.1.

Image 6.1: R833 Coldcut Road / Fonthill Road Junction

6.3.2.4.2 R833 Coldcut Road

The R833 Coldcut Road in Section 1 of the Proposed Scheme is a two-way carriageway which is subject to a speed limit of 50km/h. The carriageway width varies between 7.5m (at the M50 Motorway Bridge) and 20m (where there are bus lanes and left-turn slips) and travels in a straight alignment east to west from Fonthill Road, over the M50 Motorway. It then extends in a south-east to north-west direction, before reaching R833 Ballyfermot Road.

The existing major junction arrangements along R833 Coldcut Road from Fonthill Road to R833 Ballyfermot Road are as follows:

- R833 Coldcut Road and Cloverhill Road Junction; and
- R833 Coldcut Road and R833 Ballyfermot Road / Kennelsfort Road Upper Junction.

R833 Coldcut Road / Cloverhill Road three-arm signalised junction: This junction is a three-arm signalised junction with staggered pedestrian crossings on the south-eastern and south-western arms.

The north-western arm consists of a dedicated bus lane, an ahead lane and a right-turn lane of 60m length on the approach. The dedicated bus lane continues through the junction and is segregated from the general traffic lanes with a median strip and separate signal heads. The north-western arm exit consists of one general traffic lane of 5.5m in length.

The south-eastern arm consists of a left-turn lane of approximately 60m length and an ahead lane on the approach. The south-eastern exit consists of a dedicated bus lane and a general traffic lane which both merge into one general traffic lane approximately 50m south-east of the junction. The south-western arm consists of one general traffic lane on the approach arm. Cloverhill Road consists of a single lane. The south-western exit consists of a general traffic lane of approximately 4.5m in width.

These characteristics are shown in Image 6.2.

Image 6.2: R833 Coldcut Road / Cloverhill Road Junction

R833 Coldcut Road / R833 Ballyfermot Road / Kennelsfort Road Upper three-arm signalised junction: This junction is a three-arm signalised junction with pedestrian crossings on the northern and western arms. The northern arm has a cycle lane, an ahead lane and a right-turn lane of 30m length. The northern arm exit consists of a cycle lane and one general traffic lane.

The southern arm consists of a left-turn slip lane of approximately 28m and an ahead lane. The southern arm exit consists of an on-road cycle lane and one general traffic lane. The on-road cycle lane merges into a with-flow bus lane approximately 25m south of the junction. The western arm consists of a left-turn slip lane of approximately 40m, an on-road cycle lane and a right-turn lane. The western arm exit consists of one general traffic lane.

These characteristics are shown in Image 6.3.

Image 6.3: R833 Coldcut Road / R833 Ballyfermot Road Junction

6.3.2.4.3 Ballyfermot Road

R833 Ballyfermot Road in Section 1 of the Proposed Scheme is a two-way carriageway which is subject to a speed limit of 50km/h and varies in width between 8m to 12m. Following the R833 Coldcut Road / R833 Ballyfermot Road / Kennelsfort Road Upper signalised junction, the carriageway travels in a relatively straight alignment east to west. R833 Ballyfermot Road benefits from traffic calming measures such as speed bumps and horizontal deflections. There is also a weight restriction zone of 3.5 tonnes along R833 Ballyfermot Road, which commences at Cherry Orchard.

The westbound arrangement consists of a single vehicular lane whilst the eastbound arrangement mainly consists of two vehicular lanes; a dedicated bus lane and a standard traffic lane. The bus lane merges into the general traffic lane in some locations, for example after the pedestrian crossing at Cherry Orchard Hospital and after the yellow box entrance into the residential development serving house numbers 430 to 504 Ballyfermot Road, to the north of the carriageway.

It should also be noted that there are several site access roads facilitating residential dwellings, which run parallel to R833 Ballyfermot Road and are separated by a footpath or grass verge.

The three-arm priority junctions along R833 Ballyfermot Road into the Cherry Orchard Industrial Estate and commercial developments comprise a mix of arrangements offering left and right turning lanes where required.

These characteristics are shown in Image 6.4.

Image 6.4: Priority Junctions with Cleggan Park and Blackditch Road

The existing major junction arrangements along R833 Ballyfermot Road from Kennelsfort Road Upper to Le Fanu Road are as follows:

- R833 Ballyfermot Road and Cherry Orchard Football Club Junction;
- R833 Ballyfermot Road and Drumfinn Road Signalised Junction; and
- R833 Ballyfermot Road and Le Fanu Road Junction.

R833 Ballyfermot Road / Cherry Orchard Football Club three-arm signalised junction: This junction is a three-arm signalised junction with pedestrian crossings along the eastern and southern arms and a yellow box in the centre of the junction. There is a non-signalised priority junction approximately 45m east of this junction which provides access into Cherry Orchard Industrial Estate.

The western arm consists of a left-turn lane, an ahead lane and a right-turn lane on the approach. The approaching lanes have buff-coloured surface material and an advance stacking location for cyclists. The western arm exit consists of an on-road cycle lane and general traffic lane.

The eastern arm consists of an on-road cycle lane and one general traffic lane on the approach. The approaching lane has buff coloured surface material. The eastern arm exit consists of an on-road cycle lane, a left-turn lane and an ahead lane.

The southern arm consists of an on-road cycle lane, a left-turn lane, another on-road cycle lane and a right-turn lane. The approach traffic lanes have buff coloured surface material whilst the cycle lanes have red coloured surface material. An advanced stop line is also provided for cyclists on the approach of the southern arm. The southern arm exit consists of an on-road cycle lane and a general traffic lane.

These characteristics are shown in Image 6.5.

Image 6.5: R833 Ballyfermot Road / Cherry Orchard Football Club Junction

R833 Ballyfermot Road / Drumfinn Road three-arm signalised junction: This is a three-arm junction with pedestrian crossings on the northern and western arms. There is an existing residential access road which runs parallel to the R833 Ballyfermot Road major arm to the south of the western side and both sides to the west. The junction benefits from a yellow box marking in its centre.

The western arm consists of a cycle lane, an ahead lane and a right-turn into the residential site access road which runs parallel to R833 Ballyfermot Road. The western arm exit consists of one general traffic lane. The northern arm consists of one general traffic lane on the approach. The northern arm exit consists of one general traffic lane. The eastern arm consists of an ahead lane and a right-turn lane, approximately 40m in length. The eastern arm exit consists of one general traffic lane.

These characteristics are shown in Image 6.6.

Image 6.6: R833 Ballyfermot Road / Drumfinn Road Junction

R833 Ballyfermot Road / Le Fanu Road four-arm signalised junction: This is a four-arm signalised junction with pedestrian crossings on all arms.

The western arm consists of a cycle lane, an ahead and left-turn lane and an ahead and right-turn lane. The approaching lane has an advanced stacking location for cyclists. The western arm exit consists of one general traffic lane. The northern arm consists of an ahead and left-turn lane and an ahead and right-turn lane. The

approaching lane has an advanced stacking location for cyclists. The northern arm exit consists of one general traffic lane.

The eastern arm consists of an ahead and left-turn lane with a prohibition on right-turning movements. The approaching lane also has an advanced stop line for cyclists. The eastern arm exit consists of one general traffic lane. The southern arm consists of a left-turn lane and an ahead and right-turn lane. The approaching lane also has an advanced stacking location for cyclists. The southern arm exit consists of one general traffic lane.

These characteristics are shown in Image 6.7.

Image 6.7: R833 Ballyfermot Road / Le Fanu Road Junction

6.3.2.5 Existing Parking / Loading

Along Section 1 of the Proposed Scheme there is a total of 1,866 existing parking / loading spaces. Of the existing parking spaces, 186 spaces are located immediately along to the Proposed Scheme and the remaining 1,680 spaces located along side roads.

Parking / loading spaces along this section of the Proposed Scheme comprises of the following (see Table 6.8 for an overview of parking):

- 147 informal spaces, all of which are located along R833 Ballyfermot Road (or local access roads immediately adjacent):
- Six informal spaces are located on R833 Ballyfermot Road between Cherry Orchard Service Station and Cleggan Park, adjacent to the eastbound carriageway;
- 50 informal spaces are located on R833 Ballyfermot Road between Cleggan Road and Ballyfermot Community Centre, adjacent to the eastbound carriageway;
- 35 informal spaces are located on R833 Ballyfermot Road between Blackditch Road and Clifden Road, adjacent to the westbound carriageway;
- 25 informal spaces are located on R833 Ballyfermot Road between Clifden Road and O'Shea's Pub, adjacent to the westbound carriageway;
- 31 informal spaces are located on R833 Ballyfermot Road between Drumfinn and Le Fanu Local Access Road, adjacent to the eastbound carriageway;
- 38 paid spaces, all of which are located along R833 Ballyfermot Road. The majority of paid spaces (26 spaces) are located in front of commercial properties adjacent to the westbound carriageway (west of the Le Fanu Road Junction). A further nine spaces are located in front of commercial properties adjacent to the eastbound carriageway (west of the Le Fanu Road Junction) whilst three are located outside O'Shea's pub;

- One disabled space located in front of commercial properties adjacent to the westbound carriageway (west of the Le Fanu Road Junction); and
- Approximately 1,680 informal parking spaces located along various side roads within 200-250m of the Proposed Scheme.

Table 6.8 Section 1 – Existing Parking Spaces

Street	Parking Type	Number of Existing Parking Spaces
R833 Ballyfermot Road (including local access road)	Informal	147
	Paid	38
	Disabled	1
Side streets	Informal Parking (approximate)	1,680
Total		**1,866**

6.3.3 Section 2 – Le Fanu Road to Sarsfield Road

This Section of the Chapter outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 2 of the Proposed Scheme, between Le Fanu Road and Sarsfield Road. Section 2 of the Proposed Scheme is approximately 2.6km in length and consists of R833 Ballyfermot Road and Sarsfield Road.

6.3.3.1 Pedestrian Infrastructure

Along Section 2 of the Proposed Scheme, footpaths and street lighting are provided on both sides of the carriageway, the footpath width varies between 1.8m and 2.0m.

There are several controlled pedestrian crossings along Section 2 of the Proposed Scheme which benefit from tactile paving and dropped kerbs which can be found at the following locations:

- The three-arm R833 Ballyfermot Road / Colepark Avenue junction provides a direct signalised crossing on the eastern arm;
- The three-arm R833 Ballyfermot Road / Unnamed Road signalised junction provides a direct signalised crossings on each arm;
- The pelican crossing across R833 Ballyfermot Road provides a direct signalised crossing adjacent to Church of Our Lady of the Assumption;
- The pelican crossing across R112 Kylemore Road provides a direct signalised crossing adjacent to St Michael's National School;
- The pelican crossing across R112 Kylemore Road provides a direct signalised crossing adjacent to the Kylemore Music College;
- The pelican crossing across R833 Ballyfermot Road provides a direct signalised crossing west of St. Gabriel's Primary School;
- The pelican crossing across R833 Ballyfermot Road provides a direct signalised crossing adjacent to De La Salle, Ballyfermot;
- The three-arm R833 Ballyfermot Road / O'Hogan Road signalised junction provides a direct signalised crossing on the eastern arm. The crossing provides a pedestrian refuge island which does not have guard rails;
- The three-arm R833 Sarsfield Road / Landen Road signalised junction provides crossings on the eastern arm and on the southern arm. The eastern arm provides an indirect signalised crossing staggered by a pedestrian refuge island with guard rails. The southern arm provides a direct signalised crossing;
- The three-arm R833 Sarsfield Road / R833 Con Colbert Road / Sarsfield Road signalised junction provides an indirect signalised crossing on the eastern arm which is staggered by pedestrian refuge islands with guard rails; and

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The locations of the pedestrian crossings are illustrated in Figure 6.3b in Volume 3 of this EIAR.

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 2 of the Proposed Scheme is included in Appendix A6.4.1 (Pedestrian Impact Assessment) in Volume 4 of this EIAR.

6.3.3.2 Cycling Infrastructure

Along the R833 Ballyfermot Road, eastbound cycle facilities are intermittent and vary in quality. From the three-arm R833 Ballyfermot Road / Colepark Road Junction, there is a combined bus and cycle lane for approximately 90m. The combined bus and cycle lane is in operation from Monday to Saturday between the hours of 07:00hrs and 19:00hrs. At the eastern arm of the four-arm R833 Ballyfermot Road / R112 Kylemore Road Junction, a cycle lane commences and continues eastbound, alternating between a cycle lane and cycle track, before terminating at the three-arm R833 Sarsfield Road / R833 Con Colbert Road / Sarsfield Road Junction. An eastbound cycle lane exists approximately 15m on the approach to the three-arm Sarsfield Road / R839 Grattan Crescent Junction.

From the three-arm Sarsfield Road / R839 Grattan Crescent Junction, a westbound combined bus and cycle lane extends along the majority of the link. The combined bus and cycle lane is in operation 24 hours a day. Immediately west of the three-arm R833 Sarsfield Road / R833 Con Colbert Road / Sarsfield Road Junction, a westbound combined bus and cycle lane extends until the three-arm R833 Sarsfield Road / Landen Road Junction. The combined bus and cycle lane is in operation from Monday to Saturday between the hours of 07:00hrs and 19:00hrs. From here, a westbound advisory cycle lane commences until approximately 50m on the approach to the three-arm R833 Ballyfermot Road / R833 Sarsfield Road / St. Laurence's Road Junction.

Along the R833 Ballyfermot Road, westbound cycle facilities are intermittent. West of the three-arm R833 Ballyfermot Road / R833 Sarsfield Road / St. Laurence's Road Junction, an advisory cycle lane commences along R833 Ballyfermot Road, temporarily terminating on approach to the three-arm R833 Ballyfermot Road / O'Hogan Road Junction and the three-arm R833 Ballyfermot Road / Garryowen Road Junction. The advisory cycle lane merges into a combined bus and cycle lane approximately 150m on the approach to the four-arm R833 Ballyfermot Road / R112 Kylemore Road Junction and extends for approximately 120m. The combined bus and cycle lane is in operation between Monday and Saturday from 07:00 to 10:00, and 16:00 to 19:00hrs. A combined bus and cycle lane extends for 90m from R833 Ballyfermot Road / Ballyfermot Avenue to the three-arm R833 Ballyfermot Road / Ballyfermot Parade Junction. The combined bus and cycle lane is in operation between Monday and Saturday from 07:00 to 10:00, and 16:00 to 19:00hrs.

Cycle parking stands are provided at the following points along of the Proposed Scheme (inside the redline boundary):

- Seven Sheffield stands (able to accommodate 14 bicycles) along the access road parallel to the eastbound R833 Ballyfermot Road carriageway, outside McLoughlin's Butchers
- Four Sheffield stands (able to accommodate eight bicycles) along the R833 Ballyfermot Road westbound carriageway

Cycle parking stands are provided at the following point in the vicinity of the Proposed Scheme, albeit, outside of the redline boundary:

- 9 Sheffield stands located on R839 Inchicore Road adjacent to Hilton Dublin Kilmainham (able to accommodate 18 bicycles).

There are 26 designated cycle hire scheme parking racks in the vicinity of the Proposed Scheme, albeit, outside of the redline boundary, located along the R839 Inchicore Road, outside Kilmainham Gaol.

The existing cycle facilities along Section 2 of the Proposed Scheme are illustrated in Appendix A6.4.2 (Cycling Impact Assessment) in Volume 4 of this EIAR.

6.3.3.3 Bus Infrastructure

6.3.3.3.1 Bus Priority Measures

Bus priority measures are provided along Section 2 of the Proposed Scheme at the following locations (aside from intermittent breaks and junctions):

- An eastbound combined bus and cycle lane of approximately 90m in length is located between R833 Ballyfermot Road / Colepark Avenue Junction and R833 Ballyfermot Road / Ballyfermot Avenue Junction;
- A westbound combined bus and cycle lane of approximately 90m in length is located between R833 Ballyfermot Road / Ballyfermot Avenue Junction and R833 Ballyfermot Road / Ballyfermot Parade Junction;
- A westbound combined bus and cycle lane of approximately 120m in length is located between R833 Ballyfermot Rd / R112 Kylemore Rd roundabout and R833 Ballyfermot Rd / Garryowen Road junction approximately 40m in an eastern direction from R833 Ballyfermot Rd / R112 Kylemore Rd roundabout. It is in operation from 07:00 to 10:00, and 16:00 to 19:00, Monday to Saturday; and
- A westbound combined bus and cycle lane of approximately 520m in length is located between R833 Sarsfield Rd / First Avenue junction and R839 Grattan Cres / Sarsfield Rd junction approximately 1200m in an eastern direction from R833 Sarsfield Rd / First Avenue junction. It is in operation from 07:00 to 19:00 Monday to Saturday. It is briefly discontinued as the road carriageway passes underneath a railway bridge.

6.3.3.3.2 Bus Stop Facilities

There are currently 16 bus stops along Section 2 of the Proposed Scheme. The inbound stops are as follows:

- Stop 2697 on R833 Ballyfermot Road east of Ballyfermot Parade;
- Stop 5007 on R112 Kylemore Road north of Covent Lawns;
- Stop 2713 on R833 Ballyfermot Road adjacent to St. Gabriel's Primary School;
- Stop 2714 on R833 Ballyfermot Road adjacent to Mount La Salle;
- Stop 2715 on R833 Ballyfermot Road east of O'Hogan Road;
- Stop 2716 on R833 Sarsfield Road east Longmeadows Pitch and Putt;
- Stop 2718 on R833 Sarsfield Road east of St Mary's Avenue West; and
- Stop 2719 on Sarsfield Road east of Woodfield Avenue.

The outbound stops are:

- Stop 2655 on R833 Ballyfermot Road east of Ballyfermot Parade;
- Stop 4414 on R112 Kylemore Road north of Covent Lawns;
- Stop 2712 on R833 Ballyfermot Road west of Lynch's Lane;
- Stop 2711 on R833 Ballyfermot Road adjacent to Mount La Salle;
- Stop 2710 on R833 Ballyfermot Road west of O'Hogan Road;
- Stop 2709 on R833 Sarsfield Road opposite Longmeadows Pitch and Putt;
- Stop 2644 on R833 Sarsfield Road east of St Mary's Avenue West; and
- Stop 2643 on Sarsfield Road west of Woodfield Avenue.

Out of the 16 bus stops, no stops are indented from the carriageway. Three bus stops provide real-time information whilst all stops except one (stop 2710) provide timetable information.

The contents of Table 6.9 outlines the availability of bus stop facilities at the existing 16 bus stops between Le Fanu Road and Sarsfield Road.

Table 6.9: Section 2 - Availability of Bus Stop Facilities (of a Total 16 Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	3	19%
Timetable Information	15	94%
Shelter	10	63%
Seating	9	56%
Accessible Kerbs	5	31%
Indented Drop Off Area	0	0%

The existing bus facilities along Section 2, facilitates five bus services (79A, 79, 18, 40, 76) as previously described in Table 6.7. In addition to this, the 860 bus runs along R833 Ballyfermot Road to the east of the R112 Kylemore Road / R833 Ballyfermot Road roundabout, as outlined in Table 6.10.

Table 6.10: Section 2 - Bus Service Frequency

Service Route	Route	Typical Service Frequency	
		Weekday	Weekend
860	Dame Street – Westmoreland – Aston Quay – Wood Quay – Usher Quay – Victoria Quay – St Johns Road – Con Colbert Road – Sarsfield Road – Ballyfermot Road – Kylemore Road – Kylemore Park – New Nangor Road – Park West Plaza	Hourly	Hourly
79A, 79, 18, 40, 76	See Table 6.7.	See Table 6.7.	See Table 6.7.

6.3.3.4 General Traffic

6.3.3.4.1 R833 Ballyfermot Road

Within Section 2 of the Proposed Scheme, R833 Ballyfermot Road comprises of a two-way carriageway, with one-lane in both directions for much of its length. There are short stretches which have dedicated bus lanes of between 50m and 90m in length on either side of the road. The speed limit on this section is 50km/h.

The majority of junctions along the remainder of R833 Ballyfermot Road are priority controlled, leading to residential or commercial developments, and accompanied by road markings and signage. The existing major junction arrangements along R833 Ballyfermot Road from Le Fanu Road to R833 Sarsfield Road are as follows:

- R833 Ballyfermot Road / Colepark Avenue three-arm priority junction; and
- R833 Ballyfermot Road / R112 Kylemore Road Junction four-arm roundabout junction.

R833 Ballyfermot Road / Colepark Avenue three-arm priority junction: This junction consists of road markings and a solid traffic island in the centre of the R833 Ballyfermot Road carriageway to restrict motorists from turning right onto Colepark Avenue.

These characteristics are illustrated in Image 6.8.

Image 6.8: R833 Ballyfermot Road / Colepark Avenue Junction

R833 Ballyfermot Road / R112 Kylemore Road Junction four-am roundabout junction: This junction has yield markings on all arms. The junction has short two-lane entries on the approaches of the northern, southern and western arms and a single lane on the eastern arm. All exit arms consist of one general traffic lane.

These characteristics are illustrated in Image 6.9.

Image 6.9: R833 Ballyfermot Road / R112 Kylemore Road Junction

6.3.3.4.2 R112 Kylemore Road

R112 Kylemore Road, between Chapelizod Hill Road and R833 Ballyfermot Road, comprises of a two-way carriageway, with one-lane in both directions. There are no dedicated bus lanes or cycling facilities for its entire length (400m). Along R112 Kylemore Road, there is one priority junction **(**R112 Kylemore Road / Convent Lawns priority junction) which leads to residential developments and educational facilities.

There is one existing major junction arrangement along R112 Kylemore Road, between R833 Ballyfermot Road and Chapelizod Hill Road:

- R112 Kylemore Road / Chapelizod Hill Road / Le Fanu Road four-arm signalised junction.

R112 Kylemore Road / Chapelizod Hill Road / Le Fanu Road four-arm signalised junction: This junction consists of road markings in the centre of the R112 Kylemore Road carriageway. All entry and exit arms consist of one general traffic lane.

These characteristics are illustrated in Image 6.10.

Image 6.10: R112 Kylemore Road / Chapelizod Hill Road / Le Fanu Road Junction

6.3.3.4.3 R833 Sarsfield Road

R833 Ballyfermot Road terminates at the St. Laurence's Road priority junction, where R833 Sarsfield Road begins. R833 Sarsfield Road is a two-way carriageway and varies in width between 7.5m and 20m. The road is subject to a 50km/h speed limit and features horizontal deflection traffic calming measures.

At the R833 Sarsfield Road / Landen Road three-arm priority junction, the carriageway widens into a two-lane dual arrangement with opposing flows separated by a grass verge for approximately 200m, before continuing south-east at the junction with R833 Con Colbert Road. To the east the carriageway continues under the Iarnród Éireann railway bridge which has a 4.37m height restriction. The carriageway reduces to a single lane under the bridge which is operated by a yield sign and road markings on the north-western approach.

6.3.3.5 Existing Parking / Loading

The existing conditions for parking and loading for Section 2 of the Proposed Scheme are as follows:

- 63 paid parking spaces, all of which are located along R833 Ballyfermot Road (or local access roads immediately adjacent). 24 of the paid spaces are located to the west of Ballyfermot Village centre and 39 are located to the east;
- Four loading spaces, all of which are located along R833 Ballyfermot Road (or local access roads immediately adjacent). Two of the paid spaces are located to the west of Ballyfermot Village centre and two are located to the east;
- Five taxi bays, all of which are located to the along R833 Ballyfermot Road to the west of Ballyfermot Village centre;
- Two disabled parking spaces which are located along R833 Ballyfermot Road to the east of Ballyfermot Village centre;
- 94 informal spaces, of which 23 spaces are located adjacent to the R833 Ballyfermot Road / R112 Kylemore Road Roundabout, 44 spaces are along Kylemore Road and 27 spaces are along R833 Sarsfield Road;
- 23 informal spaces around R833 Ballyfermot Road / R112 Kylemore Road roundabout - 10 spaces to the north-west, five spaces to the south-west and eight spaces to the south-east;

- 44 informal spaces along Kylemore Road to the north of the R833 Ballyfermot Road / R112 Kylemore Road roundabout;
- 25 informal spaces along R833 Sarsfield Road at the car park on the corner of the R833 Sarsfield Road / First Avenue Junction, adjacent to the eastbound carriageway; and
- Two informal spaces along R833 Sarsfield Road at the Sarsfield Medical Centre Layby, adjacent to the westbound carriageway.

A further 694 informal parking spaces are located along various side roads running parallel to the main carriageway within 200-250m of the Proposed Scheme.

6.3.4 Section 3 – Sarsfield Road to City Centre

This Section of the Chapter outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 3 of the Proposed Scheme between R833 Sarsfield Road and Dublin City Centre.

This section commences at the R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road Junction and has a length of approximately 3.7km. It spans a length between R839 Memorial Road and Thomas Street. In addition to the main corridor, additional changes are proposed along residential streets which run broadly parallel to a section of R810 James Street to the south (Newington Lane, Basin View, St. James's Avenue, Grand Canal Place and Echlin Street) between the James's Street / Newington Lane Junction and James's Street / Echlin Street Junction.

6.3.4.1 Pedestrian Infrastructure

Along R839 Memorial Road, tree lined footpaths are provided on either side of the carriageway and are over 2.0m wide. To the south, along R839 Inchicore Road and R839 Grattan Crescent, footpaths with streetlights are provided on either side of the carriageway. The footpath along R839 Inchicore Road is less than 1.8m in width while footpaths along R839 Grattan Crescent are broadly 1.8m in width.

R810 Emmet Road consist of footpaths on either side of the carriageway of between 1.8m and 2m in width and signal-controlled pedestrian crossings at the major signalised junctions. The pedestrian facilities along R810 Old Kilmainham and R810 Mount Brown comprise of 1.6m to 2m wide footpaths along both sides of the carriageway. For the majority of this length the residential dwellings open directly onto the public footpaths. There are a number of pinch points where the footpath falls below the minimum requirement of 1.8m.

The pedestrian facilities along R810 James's Street and R810 Thomas Street comprise of 1.7m to 3m wide footpaths along both sides of the carriageway. Street lighting is provided throughout.

There are several pedestrian crossings along Section 3 of the Proposed Scheme. Signalised pedestrian crossing facilities can be found at the following locations:

- The three-arm Sarsfield Road / R839 Inchicore Road / R839 Grattan Crescent junction provides indirect signalised crossings on the eastern and western arms. Both crossings are staggered by pedestrian refuge islands with guard rails.
- The R148 Con Colbert Road / R148 Chapelizod Bypass / R839 Memorial Road three-arm signalised junction has signalised crossings on two of the three arms. A direct signalised crossing is provided on the southern arm and an indirect signalised crossing is provided on the western arm;
- The R839 Memorial Road / R839 Inchicore Road three-arm signalised junction has indirect signalised crossings on each arm, facilitated by a refuge island at the centre of the junction;
- The R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road three-arm signalised junction has indirect signalised crossings on the eastern and western arm. The crossings are staggered by a pedestrian refuge island;
- There is a pelican crossing on the R839 Grattan Crescent immediately south of Inchicore Terrace South. The crossing is direct with dropped kerbs and tactile paving;

- The R839 Grattan Crescent / R810 Emmet Road / R810 Tyrconnell Road three-arm signalised junction has crossings on all arms. There northern and eastern arms have direct signalised crossings whilst the southern arm has a pedestrian refuge island between the approach and exit arms;
- There is a pelican crossing on the R810 Emmet Road between Spa Road and Camac Close. The crossing is direct with dropped kerbs and tactile paving;
- There is a pelican crossing on the R810 Emmet Road east of Bulfin Road. The crossing is direct with a pedestrian refuge island, dropped kerbs and tactile paving;
- There is a pelican crossing on the R810 Emmet Road west of Turvey Avenue. The crossing is direct with a pedestrian refuge island, dropped kerbs and tactile paving;
- The R810 Emmet Road / R111 South Circular Road / R810 Old Kilmainham Road four-arm signalised junction has direct signalised crossing on all arms;
- There is a pelican crossing on R810 Mount Brown east of O'Reilly Avenue. The crossing is direct with a pedestrian refuge island, dropped kerbs and tactile paving;
- The R810 James's Street / St James's Hospital three-arm junction provides an indirect signalised crossing on the eastern arm which is staggered using the central reservation for pedestrian refuge and there are guard rails;
- The R810 James's Street / Bow Lane West three-arm junction has an indirect signalised crossing on the southern arm which is staggered using the central reservation for pedestrian refuge and there are guard rails;
- The R810 James's Street / Echlin Street three-arm priority junction has signalised crossing on the eastern arm. The crossing is direct with a pedestrian refuge island, dropped kerbs and tactile paving;
- The R810 James's Street / Watling Street three-arm signalised junction has signalised crossings on the northern and western arms. Both crossings are direct and the western arm crossing as a pedestrian refuge island separating the approach and exit lanes;
- There is a pelican crossing on R810 Thomas Street east of Crane Street / Roe Lane. The crossing is direct with a pedestrian refuge island, dropped kerbs and tactile paving;
- The R810 Thomas Street / R804 Bridgefoot Street / R804 Thomas Court four-arm signalised junction has signalised crossings on the northern and eastern arms. The signalised crossing on the northern arm is indirect with a pedestrian refuge island and there are guard rails. The signalised crossing on the eastern arm is direct with a pedestrian refuge island;
- The R810 Thomas Street / R804 Meath Street three-arm signalised junction has a direct signalised crossing on the southern and western arms;
- There is a pelican crossing on R810 Thomas Street to the west of John's Lane west. The crossing is direct and has dropped kerbs and tactile paving;
- The R810 Thomas Street / St Augustine Street / Francis Street four-arm signalised junction has direct signalised crossings on all arms of the junction;
- The R108 Cornmarket / R810 High Street three-arm signalised junction has indirect signalised pedestrian crossings on the north-western and eastern arms. The crossings on each arms are staggered by two pedestrian refuge islands; and
- The R108 High Street / R137 Christchurch Place / R137 Nicholas Street / Winetavern Street four-arm signalised junction provides signalised crossings on all arms of the junction. All signalised crossings at the junction are indirect with the exception of the crossing on the northern street which is direct.

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The locations of the pedestrian crossings are illustrated in Figure 6.3c in Volume 3 of this EIAR.

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 3 of the Proposed Scheme is included in Appendix A6.4.1 (Pedestrian Impact Assessment) in Volume 4 of this EIAR.

6.3.4.2 Cycling Infrastructure

Cycle facilities are discontinuous and vary in provision along Section 3 of the Proposed Scheme. Where available, cycle facilities predominately comprise combined bus and cycle lanes or cycle lanes.

Along R839 Grattan Crescent, there is southbound (inbound) cycle provision only. A southbound (inbound) combined bus and cycle lane extends from the R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road Junction to the R839 Grattan Crescent / Inchicore Terrace South Junction. The combined bus and cycle lane operates Monday to Saturday between 07:00 and 10:00 and 16:00 and 19:00.

Along R810 Emmet Road, there is limited cycling infrastructure with the exception of an eastbound (inbound) combined bus and cycle lane between the R810 Emmet Road / Myra Close Junction and the R810 Emmet Road / Old Kilmainham / R111 South Circular Road Junction. The combined bus and cycle lane operates Monday to Saturday between 07:00 and 19:00. From the R810 Emmet Road / Old Kilmainham / R111 South Circular Road Junction, there is no cycle provision until the R810 James's Street / Bow Lane West Junction.

Along R810 James's Street various eastbound (inbound) and westbound (outbound) cycle provision in available. In the eastbound direction, a combined bus and cycle lane extends between the R810 James's Street / Bow Lane West Junction and the R810 Thomas Street / St Augustine Street / Francis Street Junction, aside from intermittent breaks and junctions. The combined bus and cycle lane operates Monday to Saturday between 07:00 and 10:00 and 16:00 and 19:00. East of the R810 Thomas Street / St Augustine Street / Francis Street Junction, an advisory eastbound cycle lane extends to the R108 High Street / R137 Christchurch Place / R137 Nicholas Street / Winetavern Street Junction. In the westbound direction, a combination of advisory cycle lanes, mandatory cycle lanes and a combined bus and cycle lane extend between the R108 High Street / R137 Christchurch Place / R137 Nicholas Street / Winetavern Street Junction and the R810 James Street / James Hospital Junction. The combined bus and cycle lane operates Monday to Saturday between 07:00 and 10:00 and 16:00 and 19:00.

Cycle parking stands are provided at the following points along of the Proposed Scheme (within the redline boundary):

- 10 Sheffield stands located on R839 Grattan Cres adjacent to Inchicore Medical Centre (able to accommodate 20 bicycles);
- One Sheffield stand located on R839 Grattan Crescent immediately south of Inchicore Terrace South (able to accommodate two bicycles);
- Two Sheffield stands located on R839 Grattan Crescent approximately 50m south of the Inchicore Terrace South (able to accommodate four bicycles);
- Four Sheffield stands located on R810 Emmet Road eastbound, immediately west of Spa Road (able to accommodate eight bicycles);
- Three Sheffield stands located on R810 Emmet Road westbound, immediately west of Spa Road (able to accommodate six bicycles);
- Five Sheffield stands located on R810 Emmet Road outside Inchicore Library (able to accommodate 10 bicycles);
- Seven Sheffield stands adjacent to R810 James's Street, along Ewington Lane (able to accommodate 14 bicycles);
- Three Sheffield stands located along R810 James's Street east of the R810 James Street / Echlin Street Junction (able to accommodate six bicycles);
- Four Sheffield stands located along R810 James's Street eastbound, outside McCanns Public House (able to accommodate eight bicycles);
- Six Sheffield stands located on R810 James's Street eastbound, opposite Parish Of Saint James (able to accommodate 12 bicycles);
- 13 Sheffield stands located on R810 James's Street eastbound, opposite Guinness Open Gate Brewery (able to accommodate 26 bicycles);
- 9 Sheffield stands located along R810 James's Street westbound (able to accommodate 18 bicycles);

- Four Sheffield stands located along the eastbound carriageway of R810 Thomas Street, east of the three-arm R810 James's Street / Watling Street Junction (able to accommodate eight bicycles);
- Nine Sheffield stands located along the eastbound carriageway of R810 Thomas Street, east of the three-arm R810 James's Street / Roe Lane Junction (able to accommodate 18 bicycles);
- 12 Sheffield stands located on R810 Thomas Street east of the R810 Thomas Street / R804 Bridgefoot Street Junction (able to accommodate 24 bicycles);
- Two Sheffield stands located on R810 Thomas Street westbound, outside Saint Catherine's Church of Ireland (able to accommodate four bicycles);
- Four Sheffield stands located on R810 Thomas Street east of the R810 Thomas Street / R804 Bridgefoot Street Junction (able to accommodate eight bicycles);
- Three Sheffield stands located on the R810 Cornmarket slip road (able to accommodate six bicycles);
- Five Sheffield stands located on R108 High Street at St. Audoen's Park entrance (able to accommodate 10 bicycles); and
- 10 Sheffield stands located on High Street eastbound (able to accommodate 20 bicycles).

There are cycle parking stands in the vicinity of the Proposed Scheme, albeit, outside of the redline boundary, at the following locations:

- Three Sheffield stands adjacent to Tyrconnell Road, outside Mini Market- Polish Ethnic Food Store (able to accommodate six bicycles);
- Three Sheffield stands located along the southbound carriageway of Tyrconnell Road, outside Tesco Express store (able to accommodate six bicycles);
- Four Sheffield stands located adjacent to R810 Emmet Road, along Bulfin Road, opposite St Michael's Church (able to accommodate eight bicycles);
- Five Sheffield stands located adjacent to R810 Emmet Road, along Bulfin Road, outside Danielle's Healthy Hub (able to accommodate ten bicycles);
- Six Sheffield stands located adjacent to R111 South Circular Road, outside Zinc Hair Spa (able to accommodate 12 bicycles);
- Two Sheffield stands located adjacent to R111 South Circular Road, outside Online Laundry.com (able to accommodate four bicycles);
- 10 Sheffield stands located along Watling Street, outside Rupert Guinness Theatre (able to accommodate 20 bicycles);
- 10 Sheffield stands located along R804 Bridgefoot Street northbound (able to accommodate 20 bicycles);
- 10 Sheffield stands located along Meath Street southbound, outside Sunflowers (able to accommodate 20 bicycles);
- Three Sheffield stands located at the R810 Thomas Street / Francis Street Junction (able to accommodate six bicycles); and
- 15 Sheffield stands located along St Augustine Street, opposite La Catedral Studios (able to accommodate 30 bicycles).

There are designated cycle hire scheme parking racks along Section 3 of the Proposed Scheme at the following locations:

- 24 designated cycle hire scheme parking racks located along R810 Emmet Road, west of R111 South Circular Road;
- 14 designated cycle hire scheme parking racks located along Mount Brown, outside Emo;
- 32 designated cycle hire scheme parking racks located along R810 James's Street, outside Guinness Open Gate Brewery; and
- 16 designated cycle hire scheme parking racks located along Bridge Street Upper, at St. Audoen's Park entrance.

There are also cycle parking stands in the vicinity of the Proposed Scheme, albeit, outside of the redline boundary, including e-bike hires.

The existing cycle facilities along Section 3 of the Proposed Scheme is illustrated in Figure 6.4c in Volume 3 of this EIAR.

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 3 of the Proposed Scheme is included in Appendix A6.4.2 (Cycling Impact Assessment) in Volume 4 of this EIAR.

6.3.4.3 Bus Infrastructure

6.3.4.3.1 Bus Priority Measures

Bus priority measures are provided along Section 3 of the Proposed Scheme at the following locations (aside from intermittent breaks and junctions):

- Northbound along R839 Grattan Crescent for approximately 50m on the approach to the R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road Junction;
- Southbound along R839 Grattan Crescent to the R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road Junction and south of the R839 Grattan Crescent / Inchicore Terrace South Junction, operating Monday to Saturday between 07:00 – 10:00 and 12:00 – 19:00;
- Eastbound along R810 Emmet Road between the R810 Emmet Road / Myra Close Junction and west of the R810 Emmet Road / R111 South Circular Road / R810 Old Kilmainham Road, operating Monday to Saturday between 07:00 – 19:00;
- Eastbound along R810 James Street for approximately 60m on the exit arm of the R810 James Street / St James Hospital Junction;
- In both directions along R810 James Street between the R810 James Street / Bow Lane West Junction and the R810 Thomas Street / St Augustine Street / Francis Street Junction, operating Monday to Saturday between 07:00 – 10:00 and 12:00 – 19:00; and
- Westbound along R108 High Street between the R108 High Street / R137 Christchurch Place / R137 Nicholas Street / Winetavern Street and the R108 Cornmarket / R810 High Street Junction.

6.3.4.3.2 Bus Stop Facilities

There are 23 bus stops along Section 3 of the Proposed Scheme, between R833 Sarsfield Road and City Centre. The inbound stops are as followed:

- Stop 1989 on R810 Emmet Road west of Camac Close;
- Stop 1990 on R810 Emmet Road west of Myra Close;
- Stop 1992 on R810 Emmet Road between R111 South Circular Road and Luby Road;
- Stop 1993 on R810 Old Kilmainham west of Kearn's Place;
- Stop 1994 on R810 Mount Brown outside Millbrook Court;
- Stop 1995 R810 James's Street east of St James Hospital;
- Stop 1996 R810 James's Street adjacent Echlin Street;
- Stop 1997 on R810 James's Street west of Watling Street;
- Stop 1998 on R810 Thomas Street east of R804 Bridgefoot Street;
- Stop 1999 on R810 Thomas Street between John Street West and Augustine Street; and
- Stop 2001 on R108 High Street is located to the south-west of R108 Cornmarket.

The outbound stops are:

- Stop 2642 on R839 Grattan Crescent south of Kilmainham Bottle Bank.
- Stop 1947 on R810 Emmet Road east of St Vincent Street West;
- Stop 1946 R810 Emmet Road west of Bulfin Road;

- Stop 1945 on R810 Emmet Road between R111 South Circular Road and Luby Road;
- Stop 1944 on R810 Old Kilmainham between Brookfield Road and Kearn's Place;
- Stop 1943 on R810 Mount Brown adjacent to St James's Court Mount Brown;
- Stop 1942 on R810 James's Street west of St James's Hospital;
- Stop 1941 on R810 James's St between Bow Lane West and Echlin Street;
- Stop 1940 on R810 James's Street west of Watling Street;
- Stop 1939 on R810 Thomas Street east of R804 Bridgefoot Street;
- Stop 1938 on R810 Thomas Street west of Francis Street; and
- Stop 1937 on R108 High Street between R137 Nicholas Street and Back Lane.

Of the 23 bus stops, one stop (stop 1996) is indented whilst all other bus stops are inline along the carriageway. The majority of the bus stops provide timetables and over half of the stops provide shelters. Real time passenger information is provided at 13 stops.

The content of Table 6.11 outlines the availability of bus stop facilities at the existing 23 bus stops along Section 3 of the Proposed Scheme.

Table 6.11: Availability of Bus Stop Facilities (of a Total 23no. Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	13	57%
Timetable information	21	91%
Shelter	13	57%
Seating	9	39%
Accessible Kerbs	8	35%
Indented Drop Off Area	1	4%

The existing bus facilities along Section 3 of the Proposed Scheme are illustrated in Figure 6.5c in Volume 3 of this EIAR. The bus services which operate along Section 3 are outlined in Table 6.12.

Table 6.12: Section 3 - Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
69	Hawkins Street – Parkgate St – Tyrconnell Road – Naas Road – Clondalkin Village – Green Isle Hotel - Rathcoole	45 minutes	60 minutes
68	Newcastle – Greenogue Business Park – Cherrywood Villas – Clondalkin Village – Bulfin Road – Camden Street – Burgh Quay	70 minutes	No Services
13	Harristown – Main Street Ballymun – Drumcondra Rail Station – O'Connell Street – St James Hospital – Tyrconnell Road – Naas Road – Clondalkin Village – Grange Castle	10 minutes	30 minutes
126	Dublin (DCU) – Belfield – Kildare Street – Busaras – Connolly Luas stop – Castlewarden – Kill – Johnstown Village – Naas – Newbridge – Milltown – Rathangan – Brownstown (The Curragh) – Kildare (Boyles)	45 minutes	No services
51X	Dunawley – Cherrywood Villas – Old Nangor Road – Clondalkin Village – Monastery Road – Naas Road – St Johns Road – North Quays – Hawkins Street – Westland Row – Merrion Square – Baggot Street – Waterloo Road – Morehampton Road	Daily	No Services
68X	Greenogue Business Park - Newcastle – Peamount – Nangor Road – New Nangor Road – Naas Road – Robinhood Industrial Estate – Oblates Church – Emmet Road – James Street – Thomas Street = Lord Edward Street – Dame Street – Hawkins Street	Daily	No Services
123	Walkinstown – St James Hospital – O'Connell St – Ballybough R - Marino	10 minutes	20 minutes
40	See Table 6.7	See Table 6.7	See Table 6.7

6.3.4.4 General Traffic

6.3.4.4.1 Sarsfield Road

A short section of Sarsfield Road between the rail bridge and its junction with Grattan Cresecent appears in Section 3. The length terminates at the three-arm signalised junction with R839 Inchicore Road, approximately 300m east of the bridge. All junctions along Sarsfield Road are priority controlled, leading to residential or commercial developments, and accompanied with road markings and signage.

6.3.4.4.2 R839 Memorial Road

R839 Memorial Road is a one-way, two-lane carriageway, approximately 100m in length, connecting R839 Inchicore Road to the south with R148 Con Colbert Road to the north. The carriageway varies in width from 7.5m at the southern side to 5m at the northern side. The carriageway also changes in speed limit from 50km/h to 60km/h approximately 20m south of the R839 Memorial Road / R148 Con Colbert three-arm signalised junction.

The existing major junction arrangements along R839 Memorial Road are as follows:

- R148 Chapelizod Bypass / R148 Con Colbert Road / R839 Memorial Road; and
- R839 Inchicore Road / R839 Memorial Road.

R148 Chapelizod Bypass / R148 Con Colbert Road / R839 Memorial Road three-arm signalised junction: This junction has signalised pedestrian crossings on the southern and western arms.

The eastern arm approach consists of a combined bus and cycle lane and two straight-ahead general traffic lanes. No left turn to R839 Memorial Road is permitted from this arm. The eastern exit arm consists of a combined bus and cycle lane and two general traffic lanes.

The southern arm is a one-way road and consists of two general traffic approach lane: one left and right turn lane and one right turn only lane.

The western approach arm consists of a combined bus and cycle lane, which continues through the junction, and two straight-ahead general traffic lanes. No right turn to R839 Memorial Road is permitted from this arm. The western exit arm consists of a combined bus and cycle lane and two general traffic lanes.

These characteristics are illustrated in Image 6.11.

Image 6.11: R148 Chapelizod Bypass / R148 Con Colbert Road / R839 Memorial Road

R839 Inchicore Road / R839 Memorial Road three-arm signalised junction: This junction comprises a pedestrian refuge area in its centre, forming left-turn and right-turn slip lanes between R839 Inchicore Road and R839 Memorial Road.

The western arm consists of one left-turn lane on its approach while the western exit also has just one general traffic lane. The northern arm consists of two one-way lanes travelling north, from the western and eastern arms, with the western lane having right of way and the eastern lane operated by a 'Yield' sign.

The eastern arm consists of a cycle lane, an ahead lane, a left-turn lane and another two-way cycle lane. There is a 3.5 tonne weight restriction introduced at the approach of the ahead lane on the eastern arm.

These characteristics are illustrated in Image 6.12.

Image 6.12: R839 Inchicore Road / R839 Memorial Road Junction

6.3.4.4.3 R839 Inchicore Road

The Proposed Scheme will use a 150m long stretch of R839 Inchicore Road which is the only section of R839 Inchicore Road which has two-way flow in the vicinity of the Proposed Scheme. The carriageway is approximately 6.5m in width and has a continuous white line in its centre to restrict overtaking. All vehicular traffic travelling in an eastern direction along R839 Inchicore Road has to turn left onto R839 Memorial Road to the north.

There is one major junction along R839 Inchicore Road:

- R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road three-arm signalised junction.

R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road three-arm signalised junction: This junction provides two pedestrian refuge areas, separating each lane of the junction, along the north-western arm and eastern arm.

The north-western arm consists of an ahead lane onto R839 Inchicore Road and a right-turn lane onto R839 Grattan Road. The north-western arm exit consists of one general traffic lane.

The eastern arm consists of one-lane on the approach with right running banned for vehicles except buses and cycles travelling from R839 Inchicore Road to R833 Sarsfield Road. The eastern arm exit consists of one general traffic lane.

The south-western arm consists of a left-turn bus lane onto R833 Sarsfield Road and an ahead only lane for all other vehicular traffic onto R839 Inchicore Road.

These characteristics are illustrated in Image 6.13.

Image 6.13: R839 Inchicore Road / R839 Grattan Crescent / R833 Sarsfield Road Junction

6.3.4.4.4 R839 Grattan Crescent

R839 Grattan Crescent is a two-way carriageway of approximately 260m in length, connecting R810 Tyrconnell Road to the south with R839 Inchicore Road to the north. The carriageway is approximately 11m in width and has a continuous white line to restrict overtaking.

The carriageway generally consists of two lanes in one direction and a single lane in the other. Approximately 50m south of the R839 Inchicore Road / R839 Grattan Crescent / Sarsfield Road three-arm signalised junction, the single lanes along both directions of R839 Grattan Crescent diverge into two lanes.

The north-east facing traffic diverges into an ahead only lane and a left-turn bus lane onto Sarsfield Road. The south-west facing traffic diverges into a standard lane and a with-flow near-side bus lane, which operates from Monday to Saturday between the hours of 07:00hrs to 10:00hrs and 16:00hrs to 19:00hrs.

The majority of junctions along R839 Grattan Crescent are standard priority junctions, which provide appropriate road markings such as broken white lines and yellow box markings to allow vehicles travelling in and out of the minor arms. The arrangement of the remaining signalised junction is outlined below.

There is one major junction along R839 Grattan Crescent:

- R839 Grattan Crescent / R810 Emmet Road / R810 Tyrconnell Road three-arm signalised junction

R839 Grattan Crescent / R810 Emmet Road / R810 Tyrconnell Road three-arm signalised junction: This junction includes a yellow box road marking in the centre of the junction and pedestrian crossings on all arms.

The northern arm consists of a left-turn lane and an ahead lane on the approach. An advanced stacking location for cyclists is also located on the approach. The northern arm exit consists of one general traffic lane.

The eastern arm consists of left and right turn lanes on the approach. An advanced stacking location for cyclists is also located on the approach. The eastern arm exit consists of one general traffic lane.

The southern arm consists of an ahead lane and a right-turn lane on the approach. The southern arm exit consists of one general traffic lane. It also provides a pedestrian refuge area in the centre of the carriageway.

These characteristics are illustrated in Image 6.14.

Image 6.14: R839 Grattan Crescent / R810 Emmet Road / R810 Tyrconnell Road Junction

6.3.4.4.5 R810 Emmet Road

Following R839 Grattan Crescent, the Proposed Scheme will continue eastwards along R810 Emmet Road, which is approximately 900m in length, before reaching the R810 Emmet Road / R811 South Circular Road / R810 Old Kilmainham four-arm signalised junction.

R810 Emmet Road is a two-way carriageway with a single lane for general traffic in each direction. The carriageway is subject to a speed limit of 50km/h and benefits from traffic calming measures such as vertical deflection and road markings to delineate horizontal deflections.

At its western side the carriageway has a narrow width of approximately 5.5m with one-lane in both directions. Approximately 500m west of this, the carriageway widens to approximately 12m, at which point a with-flow near side bus lane is introduced along with hatched road markings to narrow the lane widths.

The majority of junctions along R810 Emmet Road are standard priority junctions, which provide road markings such as broken white lines and yellow box markings to allow vehicles travelling in and out of the minor arms.

There is one major junction along R810 Emmet Road:

- R810 Emmet Road / R811 South Circular Road / R810 Old Kilmainham four-arm signalised junction

R810 Emmet Road / R811 South Circular Road / R810 Old Kilmainham four-arm signalised junction: This junction consists of two-lane approaches on all, with no right-turn restrictions on the eastern and western arms. There is a 3.5 tonne weight restriction on the eastern arm.

These characteristics are illustrated in Image 6.15.

Image 6.15: R810 Emmet Road / R811 South Circular Road / R810 Old Kilmainham

6.3.4.4.6 R810 Old Kilmainham to R810 Mount Brown

The Proposed Scheme will continue east along R810 Old Kilmainham and R810 Mount Brown, which is approximately 800m in length, before reaching R810 James Street. It is a two-way carriageway with one-lane in both directions and a broken white line in its centre. The carriageway is approximately 7.5m in width and subject to a speed limit of 50km/h.

The junctions along R810 Old Kilmainham and R810 Mount Brown are priority controlled, leading to residential or commercial developments, and accompanied with road markings and signage.

6.3.4.4.7 R810 James's Street

R810 James's Street commences at the R810 Mount Brown / R810 James's Street / Ceannt Fort three-arm priority junction and continues in an east to west direction. The carriageway introduces a bus lane in both directions following the signalised access to Saint James's Hospital. At this point the Luas Red Line turns east onto R810 James's Street and travels in a parallel direction to the carriageway for approximately 200m before turning north towards Heuston Station.

The priority junctions along R810 James's Street provide signage and road markings such as broken white lines and yellow box markings to allow vehicles travelling in and out of the minor arms.

The existing major signalised junctions are as follows:

- R810 James's Street / Saint James's Hospital;
- R810 James's Street / Bow Lane West; and
- R810 James's Street / Watling Street / R810 Thomas Street.

R810 James's Street / Saint James's Hospital three-arm signalised junction: This junction includes a yellow box road marking in the centre of the junction and pedestrian crossings on the southern and eastern arms.

The western arm consists of two general traffic lanes on the approach, and one general traffic lane on exit.

The eastern arm consists of a cycle lane, a combined tram and general traffic lane and a general traffic lane on the approach. The eastern arm does not permit left-turning movements into the southern arm, except for trams. The vehicular lane is shared with the Luas Red Line. The eastern arm exit consists of a dedicated bus lane and a general traffic lane.

The southern arm consists of a single general traffic lane and is priority controlled with a dual arrangement. Opposing flows are separated by a landscaped median strip at the approach to the junction. The southern arm exit consists of one general traffic lane.

These characteristics are illustrated in Image 6.16.

Image 6.16: R810 James's Street / Saint James's Hospital Access Junction

R810 James's Street / Bow Lane West three-arm signalised junction: This junction includes a yellow box road marking in the centre of the eastern junction. At the western sections of the junction there is a signalised pedestrian crossing on the western arm and an informal pedestrian crossing on the northern arm.

At the western section of the junction, the eastern approach arm consists of a combined bus and cycle lane (in which parking is permitted outside of operational hours), a straight-ahead general traffic lane and a right-turn filter lane, approximately 50m in length. The eastern exit arm consists of a combined bus and cycle lane and one general traffic lane. This arm contains a traffic island which separates opposing traffic flows.

At the western section of the junction, the western approach arm consists of a combined bus and cycle lane and a general traffic lane. The combined bus and cycle lane commences approximately 15m prior to the junction. The western exit arm consists of a mandatory cycle lane and one general traffic lane. This arm contains a traffic island which separates opposing traffic flows.

At the western section of the junction, the northern approach arm consists of a mandatory left -turn cycle lane and a left turn general traffic lane. No right turn is permitted from this arm. The northern exit arm consists of one general traffic lane

At the western section of the junction, the northern arm consists of one general traffic approach lane and one general traffic exit lane.

These characteristics are illustrated in Image 6.17.

Image 6.17: R810 James's Street / Bow Lane West

R810 James's Street / Watling Street / R810 Thomas Street three-arm signalised junction: This junction consists of a two-lane, one-way minor arm to allow vehicular traffic to access R810 James Street and R810 Thomas Street.

The junction access into Diageo operates as a priority-controlled access at the eastern arm, with a yellow box road marking to keep the access clear.

These characteristics are illustrated in Image 6.18.

Image 6.18: R810 James's Street / Watling Street / R810 Thomas Street Junction

6.3.4.4.8 R810 Thomas Street

R810 Thomas Street commences at the R810 James's Street / Watling Street / R810 Thomas Street three-arm signalised junction and continues in an east to west direction. R810 Thomas Street continues as a two-way, two-lane carriageway with a bus lane and vehicular lane in both directions.

The priority junctions along R810 Thomas Street provide signage and road markings such as broken white lines and yellow box markings to allow vehicles travelling in and out of the minor arms.

The existing major signalised junctions are as follows:

- R810 Thomas Street / Bridgefoot Street / R804 Thomas Court;
- R810 Thomas Street / R804 Meath Street; and
- R810 Thomas Street / Francis Street / St. Augustine Street.

R810 Thomas Street / Bridgefoot Street / R804 Thomas Court three-arm signalised junction: This junction includes a yellow box road marking in the centre of the junction and pedestrian crossings along the northern and eastern arms.

The western arm consists of two lanes with a cycle lane that starts at the approach. The western arm exit consists of a cycle lane, a dedicated bus lane and a general traffic lane.

The northern arm consists of a cycle lane, a left-turn lane and an ahead and right-turn lane with an advanced stacking location for cyclists on the approach. The northern arm exit consists of one general traffic lane.

The eastern entry arm consists of a cycle lane, a dedicated bus lane and a general traffic lane on the approach. The eastern arm exit mirrors this, also consisting of an on-road cycle lane, a dedicated bus lane and a general traffic lane.

The southern arm is priority controlled. Right turning movements from the eastern arm onto Bridgefoot Street are not permitted between the hours of 07:00hrs and 10:00hrs and 16:00hrs and 19:00hrs.

These characteristics are illustrated in Image 6.19.

Image 6.19: R810 Thomas Street / Bridgefoot Street / R804 Thomas Court Junction

R810 Thomas Street / R804 Meath Street three-arm signalised junction: This junction consists of a two-lane, one-way minor arm to allow vehicular traffic to access R810 Thomas Street.

The western arm consists of a cycle lane and an ahead lane on the approach, with a prohibition for right-turning traffic onto R804 Meath Street. The western arm exit consists of a general traffic lane.

The eastern arm consists of one general traffic lane on the approach, with a restriction on left-turning traffic onto R804 Meath Street. The eastern arm exit consists of a dedicated bus lane and a general traffic lane.

The southern arm is a one-way carriageway which consists of a left-turn lane and a right-turn lane.

These characteristics are illustrated in Image 6.20.

Image 6.20: R810 Thomas Street / R804 Meath Street Junction

R810 Thomas Street / Francis Street / St. Augustine Street four-arm signalised junction: This junction consists of three arms operated by signal control and a fourth, the southern arm (Francis Street), operated by priority control. Pedestrian crossings are provided at all arms. A yellow box road marking is provided in the centre of the junction.

The northern arm (St. Augustine Street) consists of two lanes and operates one-way southbound. The eastern arm consists of two lanes on the approach and two lanes on the exit. The southern arm (Francis Street) consists of a single lane and is a one-way southbound carriageway. The western arm consists of two lanes on the approach and one lane on the exit.

These characteristics are illustrated in Image 6.21.

Image 6.21: R810 Thomas Street / Francis Street / St. Augustine Street Junction

6.3.4.4.9 R108 High Street

This short section of R108 High Street is included within the Proposed Scheme and is a six-lane dual carriageway with opposing directions separated by a narrow median strip.

Eastbound, it comprises two general traffic lanes, alongside a bus lane. Westbound, it has three general traffic lanes and an advisory cycle lane.

There is one major junction along R108 High Street:

- R810 Thomas Street / R108 High Street (Cornmarket) Junction three-arm signalised junction

R810 Thomas Street / R108 High Street (Cornmarket) Junction three-arm signalised junction: This junction has a yellow box in the centre and pedestrian crossings across the northern and eastern arms.

The northern arm consists of two lanes travelling ahead onto R108 High Street and two lanes travelling right onto R810 Thomas Street on the approach. The northern arm exit consists of a general traffic lane. The opposing flows are divided by pedestrian refuge areas.

The eastern arm consists of an on-road cycle lane, an ahead lane and two right-turn lanes on the approach. The eastern arm exit consists of an on-road cycle lane and three general traffic lanes.

The western arm consists of two general traffic lanes on the approach and two general traffic lanes on the exit.

These characteristics are illustrated in Image 6.22.

Image 6.22: R810 Thomas Street / R108 High Street Junction

6.3.4.4.10 Off Corridor Streets (Proposed Quiet Street)

In addition to the main corridor, additional improvements are proposed along residential streets which run broadly parallel to the south of R810 James's Street between the James's Street / Newington Lane Junction and James's Street / Echlin Street Junction. The proposed quiet street covers Newington Lane, Basin View, St. James's Avenue, Grand Canal Place and Echlin Street, all of which are subjects to a 30km/h speed limit.

Newington Lane and Basin View have two-way carriageways with no centre line markings to separate traffic travelling in opposite directions. For the most part, the carriageway widths are constrained by on-street parking. Traffic calming measures (raised tables) are located along the carriageway to reinforce the 30km/h speed limit.

St. James's Avenue is a one-way carriageway permitting eastbound vehicles. The street is subject to a 3.5t weight restriction and parking restrictions in the form of double yellow lines are on the southern side of the carriageway.

Grand Canal Place and Echlin Street have two-way carriageways with no centre line markings to separate traffic travelling in opposite directions.

6.3.4.5 Existing Parking / Loading

Along Section 3 of the Proposed Scheme there is a total of 1,953 existing parking / loading spaces. Of the existing parking spaces, 373 spaces are located along the Proposed Scheme corridor and the remaining 1,580 spaces are located along side roads.

Parking / loading spaces along this section of the Proposed Scheme comprises of the following:

- 248 paid parking spaces, the majority of which (127 spaces) are located on R810 Emmet Road whilst 18 paid spaces are located on R839 Grattan Road, 18 are located on R810 Old Kilmainham, 37 on R810 Mount Brown, two on Bow Lane West, 11 on R810 James Street, 32 on R810 Thomas Street and three on R108 High Street;
- 18 loading spaces, of which three are located on R839 Grattan Crescent, one is located on R810 Emmet Road, one on R810 Mount Brown, one on Bow Lane West, one on R810 James Street, seven on R810 Thomas Street and four on R108 High Street;
- Eight disabled parking spaces, of which three are located on R839 Grattan Crescent, one is located on R810 Emmet Road, one on R810 Mount Brown and three on R810 Thomas Street; and
- 99 informal parking spaces located along Newington Lane, Basin Street Lower, Saint James's Avenue, Grand Canal Place and Echlin Street.
- A further 1,580 informal parking spaces are located along various side roads running parallel to the main carriageway within 200-250m of the Proposed Scheme.

6.4 Potential Impacts

This Section presents potential impacts that may occur due to the Construction and Operational Phases of the Proposed Scheme, taking into account the Proposed Scheme design in the absence of any further mitigation. This informs the need for mitigation or monitoring to be proposed (refer to Section 6.5). Predicted 'residual' impacts taking into account any proposed mitigation are then presented in Section 6.6.

6.4.1 Characteristics of the Proposed Scheme

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

6.4.2 'Do Nothing' Scenario

With regards to this Traffic and Transport Chapter, the 'Do Nothing' scenario means there would be no changes to existing transport infrastructure and hence, 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.

6.4.3 'Do Minimum' Scenario

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

For the qualitative analysis the assessment is undertaken in relation to the conditions of the existing transport network, which have been outlined in Section 6.3 (Baseline Environment) corresponding with a Do Nothing scenario. As a result of the COVID-19 pandemic a number of temporary transport mobility measures have been implemented. Due to their temporary status, the measures are not considered a permanent long-term feature of the receiving environment and as such have not been considered in the impact assessments.

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 includes 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.

6.4.3.1 Do Minimum Transport Schemes

The core reference case (Do Minimum) modelling scenarios (Opening year - 2028 and Design year - 2043) are based on the progressive roll-out of the Greater Dublin Area (GDA) Transport Strategy 2016-2035 (NTA 2016) (hereafter referred to as the GDA Strategy), with a partial implementation by 2028, in line with National Development Plan (NDP) investment priorities and the full implementation by 2043.

The GDA Strategy provides an appropriate transport receiving environment for the assessment of the Proposed Scheme for the following reasons:

- The GDA Strategy is the approved statutory transportation plan for the region, providing a framework for investment in transport within the region up to 2035;
- The GDA Strategy provides a consistent basis for the 'likely' future receiving environment that is consistent with Government plans and policies, National Planning Framework (NPF) and National Development Plan (NDP); and
- Schemes within the GDA Strategy are a means to deliver the set of objectives of the GDA Strategy. The sequencing and delivery of the strategy is defined by the implementation plan, but the optimal outcome of aiming to accommodate all future growth in travel demand on sustainable modes underpins the Strategy.

The Do Minimum scenarios (in both 2028 and 2043) include all other elements of the BusConnects Programme of projects (apart from the CBC Infrastructure Works elements) i.e. the new BusConnects routes and services (as part of the revised Dublin Area bus network), new bus fleet, and the Next Generation Ticketing and integrated fare structure proposals.

In 2028, other notable Do Minimum transport schemes include; the roll out of the DART+ Programme, Luas Green Line capacity enhancement and the Greater Dublin Area Cycle Network Plan implementation (excluding BusConnects CBC elements). As outlined above, the 2043 Do Minimum scenario assumes the full implementation of the GDA Strategy schemes, so therefore assumes that proposed major transport schemes such as MetroLink, DART+ Tunnel, and Luas line extensions to Lucan, Finglas and Bray are all fully operational.

Appendix A6.2 (Transport Modelling Report) in Volume 4 of this EIAR contains further information on the modelling assumptions contained within the Do Minimum scenario including the full list of transport schemes included.

6.4.3.2 Do Minimum Transport Demand

The transport demand changes for the 2028 and 2043 assessment years have been included in the analysis contained within this chapter, using travel demand forecasting, which accounts for increases in population and economic activity, in line with planned growth contained within the NPF, Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland region and the local development plans for the GDA Local Authorities.

It is envisaged that the population will grow by 11% up to 2028 and 25% by 2043 (above 2016 census data levels). Similarly, employment growth is due to increase by 22% by 2028 and 49% by 2043 (Source: NTA Reference Case Planning Sheets 2028, 2043). The assessment also assumes that goods vehicles (HGVs and LGVs) continue to grow in line with forecasted economic activity with patterns of travel remaining the same. For example, the assessment assumes a 45% and 77% increase in goods traffic versus the base year in 2028 and 2043 respectively.

The GDA Strategy (along with existing supply side capacity constraints e.g. parking availability, road capacity etc.) has the effect of limiting the growth in car demand on the road network into the future. This is shown diagrammatically in Diagram 6.4. Total trip demand (indicated by the dashed line) will increase into the future in line with demographic growth (population and employment levels etc.). To limit the growth in car traffic and to

ensure that this demand growth is catered for predominantly by sustainable modes, a number of measures will be required, that include improved sustainable infrastructure and priority measures delivered as part of the NDP / GDA Strategy. In addition to this, demand management measures will play a role in limiting the growth in transport demand, predominantly to sustainable modes only. The result will be only limited or no increases overall in private car travel demand. The Proposed Scheme will play a key role in this as part of the wider package of GDA Strategy measures.

In general, total trip demand (combining all transport modes) will increase into the future in line with population and employment growth. A greater share of the demand will be by sustainable modes (Public Transport (PT), Walking, Cycling). Private car demand may still grow in some areas but not linearly in line with demographics, as may have occurred in the past.

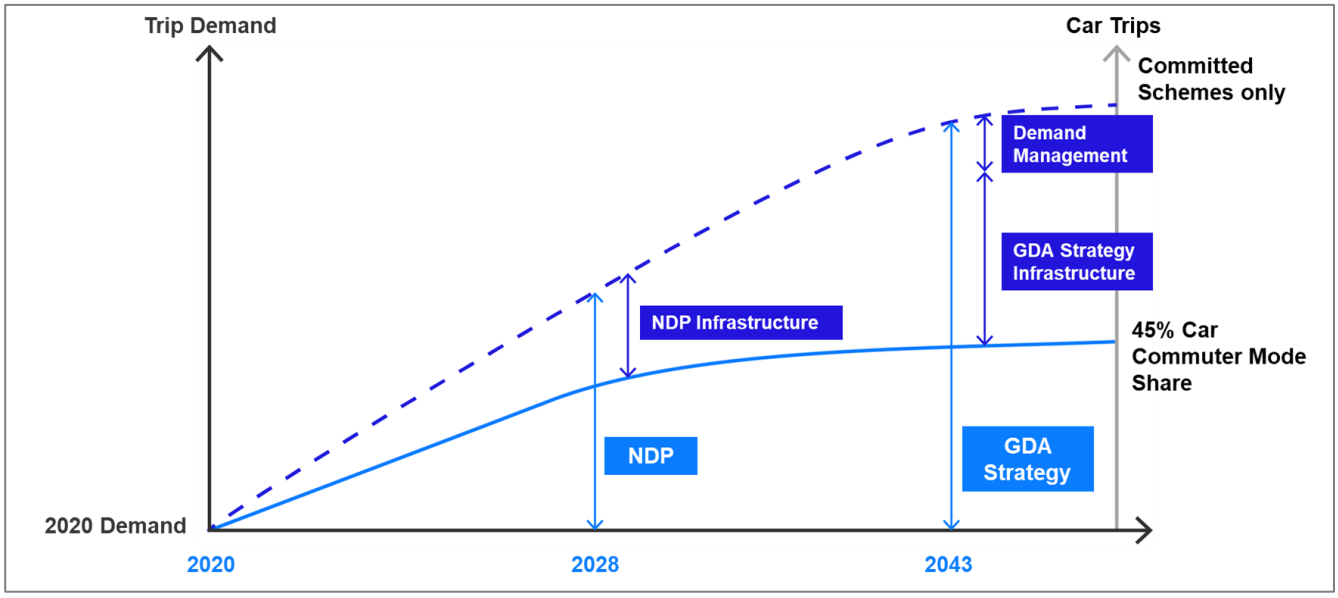


Diagram 6.4: Trip Demand Growth and the GDA Strategy

In terms of the transport modelling scenarios for the traffic and transport assessment, as per the GDA Strategy proposals, there are no specific demand management measures included in the Do Minimum scenario in the 2028 Opening year, other than constraining parking availability in Dublin at existing levels. For the design year, 2043 scenario, a proxy for a suite of demand management measures is included in the Do Minimum in line with the target to achieve a maximum 45% car driver commuter mode share target, across the GDA, as outlined in the GDA Strategy.

6.4.4 'Do Something' Scenario

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

6.4.5 Construction Phase

This Section considers the potential temporary traffic and transport impacts that construction of the Proposed Scheme will have on the direct and indirect study areas during the Construction Phase.

Chapter 5 (Construction) has been prepared to demonstrate the likely approach that will be taken to construct the Proposed Scheme, while it also 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 set out in Chapter 5 (Construction).

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 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 National Roads Authority (NRA) (now TII) Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (NRA 2007), 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 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.

As with any construction project, the appointed contractor will be obliged to prepare 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 Phase 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 Scheme, throughout the Construction Phase.

6.4.5.1 Description of Construction Works

The Proposed Scheme has been divided into three principal sections. The division line between sections has been determined by grouping similar carriageway types together. These sections have been further subdivided into 12 sub-sections, according to the types of construction works required. The sections / sub-sections are the following (as shown in Diagram 6.5):

- Section 1: Liffey Valley to Le Fanu Road
  - **Section 1a:** Liffey Valley Shopping Centre to M50 Overbridge
  - **Section 1b:** M50 Overbridge to Ballyfermot Road
  - **Section 1c:** Ballyfermot Road to Cherry Orchard Service Station
  - **Section 1d:** Cherry Orchard Service Station to Le Fanu Road
- Section 2: Le Fanu Road to Sarsfield Road
  - **Section 2a:** Le Fanu Road to Kylemore Road
  - **Section 2b:** Kylemore Road to St. Laurence's Road
  - **Section 2c:** St. Laurence's Road to Con Colbert Road
- Section 3: Sarsfield Road to City Centre
  - **Section 3a:** Con Colbert Road to Emmet Road
  - **Section 3b:** Emmet Road to South Circular Road
  - **Section 3c:** South Circular Road Junction to Bow Lane West
  - **Section 3d:** Bow Lane West to Cornmarket
  - **Section 3e:** Cornmarket to High Street

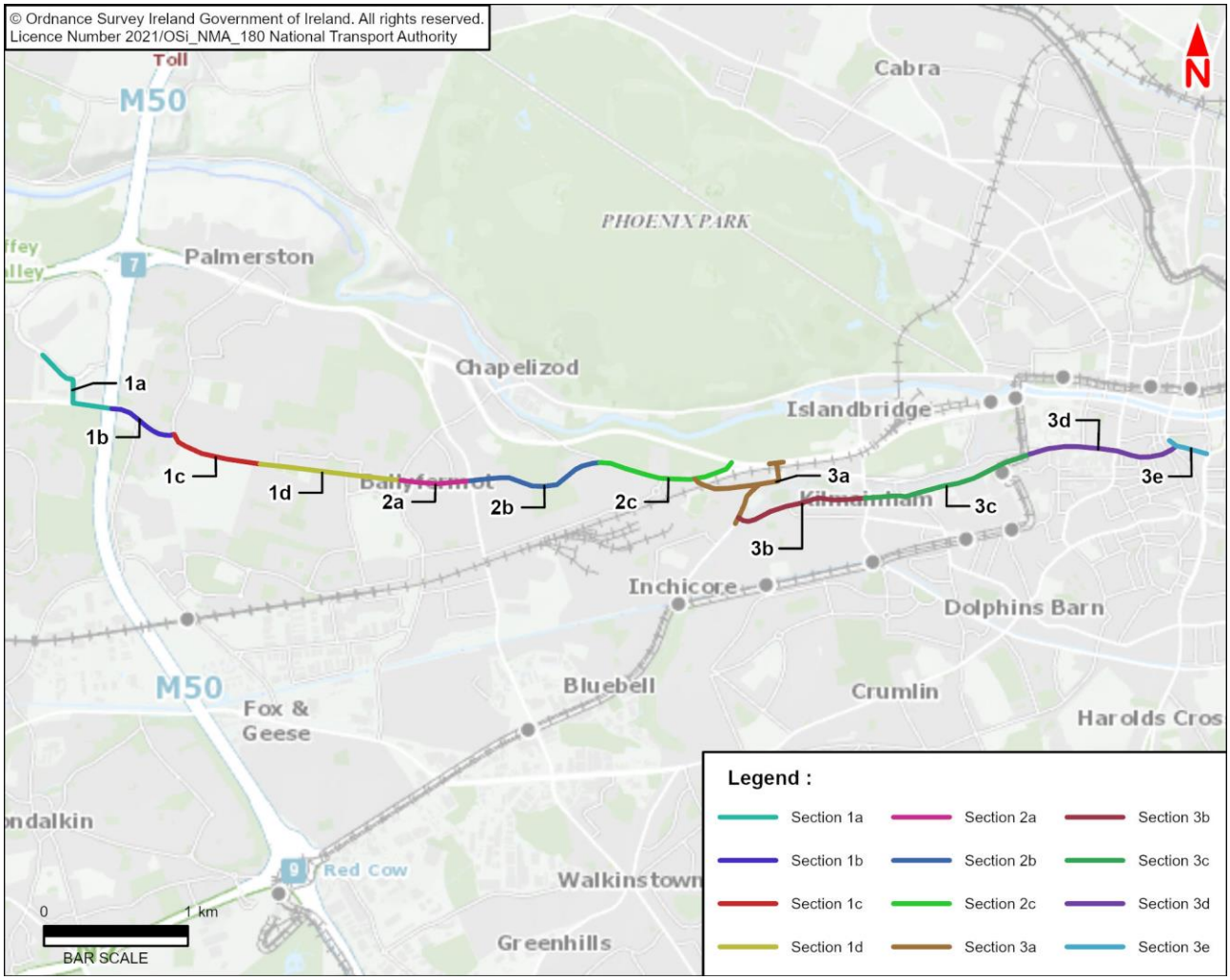


Diagram 6.5: Proposed Subsections of Construction Phase

6.4.5.2 Construction Programme

An outline, indicative programme for construction of the Proposed Scheme is provided in Chapter 5 (Construction) of this EIAR. The Proposed Scheme is estimated to require 30 months (approximately) to complete, however, individual activities will have shorter durations. Works are envisaged to proceed concurrently on multiple work-fronts to minimise the overall construction duration.

6.4.5.3 Construction Route

Three construction compounds have been identified due to the amount of available space, and the proximity to the Proposed Scheme major works and National and Regional Road network. The locations for Construction Compounds are identified on lands adjacent to Fonthill Road, Coldcut Road and Sarsfield Road (as shown in Diagram 6.6). The appointed contractor's CTMP shall include measures for managing traffic accessing and egressing the compounds. The appointed contractor will be responsible for developing the final layout and use of the Construction Compounds within the framework set out within the EIAR. The appointed contractor may identify other (or additional) Construction Compound locations, subject to gaining all necessary approvals. In addition to the Construction Compound, temporary / portable welfare facilities will be provided along the Proposed Scheme.

The haulage of material on site is anticipated to be minimal. There will however be the removal of excavated material and the delivery of construction materials to site. It is anticipated that the exporting and delivery of materials will be executed as efficiently as possible using dedicated Construction Access Routes. Construction

vehicles will be directed to access work sections via the Proposed Scheme and dedicated routes on the National and Regional Road Network where practicable, to minimise use of the local road network.

The following National Primary roads will be utilised as construction vehicle routes during the Construction Phase (as shown in Diagram 6.6):

- M50 Motorway;
- N4 Lucan Road;

The following Regional Roads will be utilised as construction vehicle routes during the Construction Phase (as shown in Diagram 6.6):

- R108;
- R111;
- R112;
- R113;
- R148;
- R804;
- R810;
- R833; and
- R839.

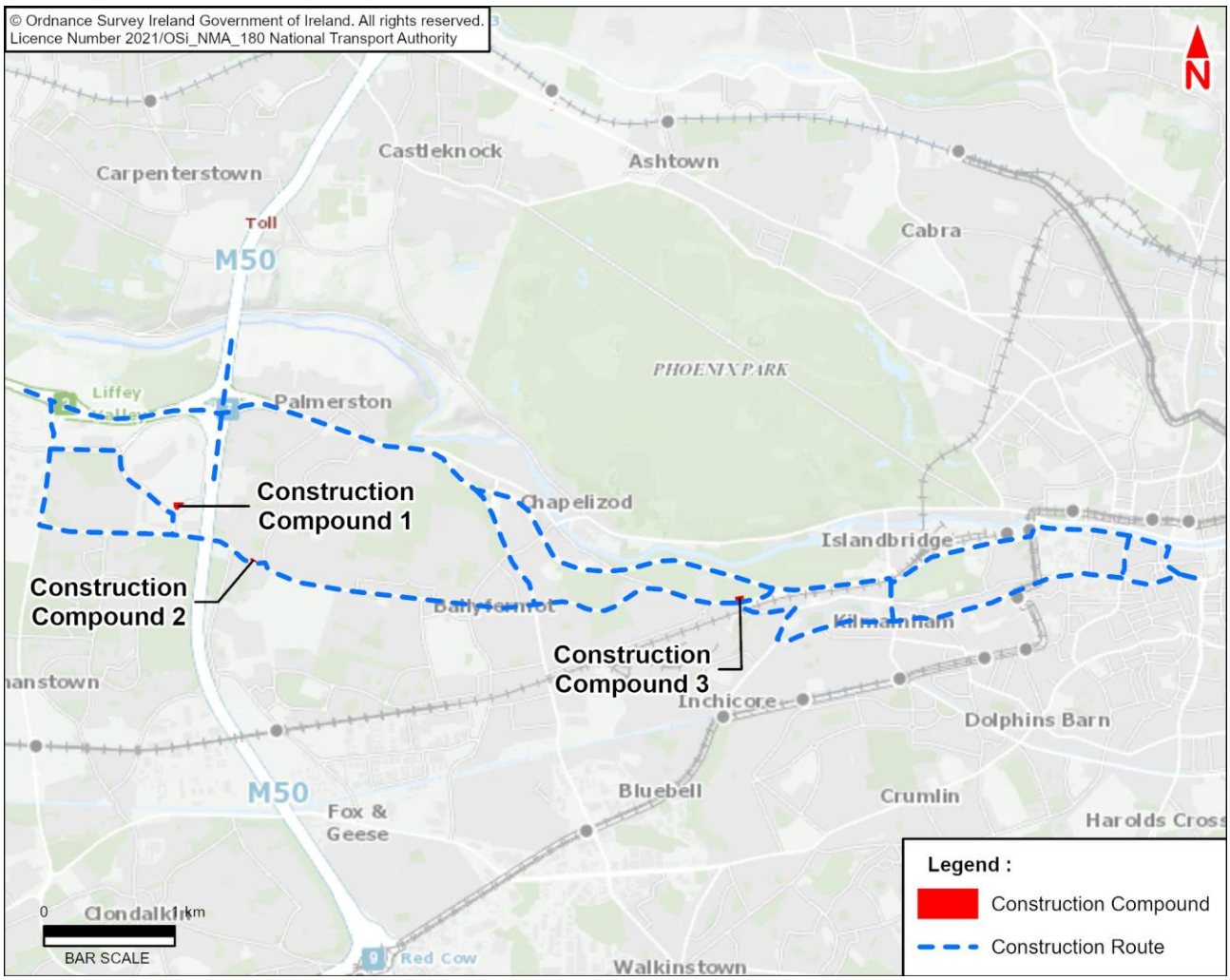


Diagram 6.6: Proposed Construction Routes and Compound Locations

6.4.5.4 Potential Construction Impact

6.4.5.4.1 Overview

Construction of the Proposed Scheme has the potential to impact people's day-to-day activities along the corridor while the works are underway. Chapter 5 (Construction) and the CEMP (Appendix A5.1 in Volume 4 of this EIAR), identify impactful activities, considers their effect, and identifies mitigation measures to reduce or remove their impact insofar as practicably possible.

For construction activities on or adjacent public roads, all temporary traffic measures to facilitate the works will be undertaken in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks' (DTTAS 2019a) and associated guidance. Chapter 5 (Construction) contains temporary traffic management proposals for the Proposed Scheme. These proposals maintain safe distance 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 Scheme. All road closures and diversions will be determined by the NTA, who may liaise with the Local Authority and An Garda Síochána, as necessary. The need for temporary access restrictions will be confirmed with residents and businesses prior to their implementation.

6.4.5.4.2 Pedestrian Provisions

As described in Chapter 5 (Construction), pedestrians may be temporarily impacted by construction activities along the Proposed Scheme corridor. Pedestrian diversions and temporary surface footpaths will be used to facilitate pedestrian movements around work areas. Access to local amenities, such as to bus stops, traffic crossings, private dwellings, and businesses, may be temporarily altered but access will be maintained.

Due consideration will be given to pedestrian provisions in accordance with Section 8.2.8 of the Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks' (DTTAS 2019a) and the DTTAS Temporary Traffic Management Design Guidance (DTTAS 2019b), to ensure the safety of all road users, in particular pedestrians (including able-bodied pedestrians, wheel-chair users, mobility impaired pedestrians, pushchair users etc.). Therefore, where footpaths are affected by construction, a safe route will be provided past the works area, and where practicable, provisions for matching existing facilities for pedestrians. Due consideration will also be given to the need for temporary ramps, and measures for accessible users, where changes in elevation are temporarily introduced to facilitate works and footpath diversions. Entrance points to the construction zone will be controlled as required. The impact is considered to have **a Negative, Slight and Temporary effect** on pedestrians.

6.4.5.4.3 Cycling Provisions

Cyclists may be temporarily impacted by construction activities along the Proposed Scheme corridor. As part of Temporary Traffic Management arrangements, the appointed Contractor will give due consideration to cyclist provision in accordance with Section 8.2.8 of the DTTAS Chapter 8, Temporary Traffic Measures and Signs for Roadworks of the Traffic Signs Manual (DTTAS 2019a) and the DTTAS Temporary Traffic Management Design Guidance (DTTAS 2019b), including the use of site-based risk assessments. Therefore, where 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 cyclists will be made. The impact is considered to have **a Negative, Moderate and Temporary effect** on cyclists.

6.4.5.4.4 Public Transport Provisions

Existing public transport routes will be maintained throughout the duration of the Construction Phase of the Proposed Scheme (notwithstanding potential for occasional road closures / diversions as described in Chapter 5 (Construction) of this EIAR). Wherever practicable, bus services will be prioritised over general traffic. However, the temporary closure of sections of existing dedicated bus lanes may be required to facilitate the construction of new bus priority infrastructure that is being developed as part of the Proposed Scheme. It is also likely that some existing bus stop locations may need to be temporarily relocated to accommodate the works. In such cases operational bus stops will be safely accessible to all users. The impact is considered to have **a Negative, Moderate and Temporary effect** on public transport users.

6.4.5.4.5 Parking and Loading

Parking and loading locations may be temporarily impacted by construction activities along the Proposed Scheme corridor. There may be temporary restrictions to on-street parking and loading facilities. The appointed contractor will discuss temporary traffic management measures with the road authority and directly affected residents / business with the aim of minimising disruption. The impact is considered to have **a Negative, Slight and Temporary effect** on parking and loading.

6.4.5.4.6 General Traffic

The Proposed Scheme will be constructed to ensure the mitigation of disturbance to residents, businesses and existing traffic. Localised temporary lane or road closures may be required for short periods. Details of illustrative temporary traffic management measures to facilitate construction of the Proposed Scheme are included in Chapter 5 (Construction). All road closures and diversions will be determined by the NTA, who may liaise with the local authority and An Garda Síochána, as necessary. It should be noted that access will be maintained for emergency vehicles along the Proposed Scheme, throughout the Construction Phase.

6.4.5.4.6.1 General Traffic Redistribution

Significant impacts due to general traffic redistribution away from the direct study area are not anticipated during the Construction Phase based on the intended nature of the progressive works along the corridor whereby traffic flows are to be maintained in both directions. There may be a requirement for some localised temporary lane closures for short durations of the day, which will involve consultation between the appointed contractor and relevant authorities. Access for general traffic to existing residential and commercial units immediately adjacent to the Proposed Scheme is to be accommodated throughout the Construction Phase.

The appointed contractor will develop a CTMP that gives due consideration to provision of local access requirements and designates appropriate diversion routes in the case where localised temporary closures are required. Overall, for these reasons, the impact on general traffic redistribution is anticipated to be **Negative, Moderate and Temporary** due to the temporary nature of any restrictions.

For the purpose of Chapter 7 (Air Quality), Chapter 8 (Climate) and Chapter 9 (Noise & Vibration) impacts assessments, a worst-case scenario for construction activities was considered for assessment purposes and has been modelled in the LAM based on a notional stage of construction whereby the proposed Bus Gate at Mount Brown were in place and Sections 2a, 3a, and 3e were under construction concurrently. Further details on the impacts assessment can be found within these chapters.

6.4.5.4.6.2 Construction Traffic Generation

Site Operatives: As described in Chapter 5 (Construction) of this EIAR, it is expected that there will be 250 to 270 staff directly employed across the Proposed Scheme, rising to 300 staff during peak construction periods.

Typical work hours on site are between 07:00 and 23:00 with staff working across early and late shifts. The adopted shift patterns help minimise travel by personnel during the peak hour periods of 08:00 to 09:00 and 17:00 to 18:00.

The appointed contractor will prepare a Construction Stage Mobility Management Plan (CSMMP) which will be developed prior to construction, as described in Appendix A5.1 (CEMP) in Volume 4 of this EIAR, 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.

Heavy Goods Vehicles (HGVs): Additional construction traffic will be generated during the Construction Phase of the Proposed Scheme, for the purpose of the following:

- Clearance of existing site material and waste;

- Deliveries of construction material; and
- Removal of construction / demolition waste material.

Chapter 5 (Construction) of this EIAR provides a breakdown of the expected operation for the Construction Phase of the Proposed Scheme. It should be noted that the CTMP of Appendix A5.1 (CEMP) in Volume 4 of this EIAR will control vehicular movement along the construction route, including restrictions on the number of HGVs accessing and egressing the construction site areas throughout the day to mitigate the impacts to general traffic on the surrounding road network. For this assessment, the maximum number of HGVs expected to be in operation across the Proposed Scheme during peak haulage activities is 34 vehicles. In a typical hour during peak haulage activity of the Proposed Scheme, 40% of HGVs are anticipated to be in operation. This equates to 14 HGVs in operation. A total of 14 two-way truck movements are expected in a typical hour during peak haulage activity of the Proposed Scheme. HGV movements will be managed during the periods of 07:00 to 09:00 and 17:00 to 19:00 to minimise the impact of construction related traffic.

Overall Peak Hour Impacts: The contents of Table 6.13 identifies the anticipated maximum construction traffic generation by site operatives and HGVs during the AM and PM Peak Hours.

Table 6.13: Anticipated Maximum Construction Traffic Generation during Construction Phase

Peak Hour	Arrivals		Departures		Total Two-Way Traffic Flows (vehicles)	Total Two-Way Traffic Flows (PCUs)
	Car / Van (1 PCU)	HGV (2.3 PCUs)	Car / Van (1 PCU)	HGV (2.3 PCUs)		
AM Peak Hour	10	14	0	14	34	74
PM Peak Hour	0	14	10	14	34	74

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 traffic impacts of the Construction Phase to have a **Negative, Slight 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.

6.4.5.5 Construction Phase Summary

The contents of Table 6.14 present a summary of the predicted impacts of the Proposed Scheme during the Construction Phase.

Table 6.14: Summary of Construction Phase Predicated Impacts

Assessment Topic	Effect	Potential Impact
Walking	Restrictions to pedestrians along Proposed Scheme.	Negative, Slight and Temporary
Cycling	Restrictions to cyclists along Proposed Scheme	Negative, Moderate and Temporary
Bus	Restrictions to public transport along Proposed Scheme.	Negative, Moderate and Temporary
Parking and Loading	Restrictions to parking / loading along Proposed Scheme.	Negative, Slight and Temporary
General Traffic	Restrictions to general traffic along Proposed Scheme	Negative, Moderate and Temporary
	Additional construction traffic flows upon surrounding road network	Negative, Slight and Temporary

6.4.6 Operational Phase

6.4.6.1 Overview

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.

6.4.6.2 Qualitative Assessment

6.4.6.2.1 Qualitative Assessment Methodology

The structure of the qualitative assessment is consistent with the Baseline Environment (Section 6.3) where the Proposed Scheme has been split into three 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 in the following sections.

6.4.6.2.1.1 Pedestrian Infrastructure

The impacts to the quality of the Pedestrian Infrastructure as a result of the Proposed Scheme have been considered with reference to any changes to the existing pedestrian facilities along footpaths and crossing locations within the direct study area. Reference has been made to the overall changes along the full length of the Proposed Scheme 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 Scheme 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 Section 6.7. The contents of Table 6.15 outline the assessment criteria for each junction.

Table 6.15: 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 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 carriageway lane widths?
Accessibility	Where crossings exist, are there adequate tactile paving, dropped kerbs (or raised table treatment) 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 6.16 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 6.16: Pedestrian Junction Assessment LoS

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

When comparing the Do Minimum and Do Something scenarios for pedestrians, the terms outlined in Table 6.17 have been used to describe the impact, based on the changes in the Qualitative Pedestrian LoS rating.

Table 6.17: Description of Impact for Pedestrian Qualitative Assessment

Magnitude of Impact	Change in LoS Rating
High	4 to 5
Medium	2 to 3
Low	1
Negligible	0

To establish the Significance of Effect for the impacts of the Pedestrian Infrastructure, as a result of the Proposed Scheme, a sensitivity rating has been applied to each junction in accordance with the methodology set out in Section 6.2.4.

6.4.6.2.1.2 Cycling Infrastructure

The impacts to the quality of the cycling infrastructure as a result of the Proposed Scheme have been considered with reference to the changes in physical provision for cyclists provided during the Do Minimum and Do Something scenarios. The NTA's National Cycle Manual's Quality of Service (QoS) Evaluation criteria have been adapted for use in assessing the cycling qualitative impact along the Proposed Scheme. 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 6.18 outline the assessment criteria with reference to the corresponding LoS ratings.

Table 6.18: 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

As the cycle provision varies along the corridor, each section of the Proposed Scheme has been further separated into smaller subsections in order to apply the cycling assessment criteria appropriately.

When comparing the Do Minimum and Do Something scenarios for cyclists, the terms outlined in Table 6.19 have been used to describe the impact, based on the changes in the Qualitative Cycling LoS rating.

Table 6.19: 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 Scheme, a sensitivity rating has been applied to each assessed section in accordance with the methodology set out in Section 6.2.4.

6.4.6.2.1.3 Bus Infrastructure

The implementation of the Proposed Scheme 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;
- Bus stop provision; and
- Changes to the existing bus stop facilities:
  - Real-time information;
  - Timetable information;
  - Shelters;
  - Seating;
  - Accessible kerbs (containment Kassel kerbs); and
  - Removal of indented drop off areas, where appropriate.

The magnitude of impact of the Proposed Scheme, applied to the qualitative review of the above factors, is set out in Table 6.20.

Table 6.20: 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 Scheme, a sensitivity rating has been applied to each assessed section in accordance with the methodology set out in Section 6.2.4.

6.4.6.2.1.4 Parking and Loading

The impacts of the Proposed Scheme on parking and loading provision have been assessed through a comparison of the availability of spaces or lengths of bay in the Do Minimum (baseline environment) and Do Something 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 Scheme. It classifies parking into the following categories:

- Designated Paid Parking;
- Permit Parking;
- Disabled Permit Parking;
- Loading / Unloading (in designated Loading Bays)
- Loading / Unloading (outside designated Loading Bays)
- Taxi Parking (Taxi Ranks);
- Commercial vehicles parked for display (car sales); and
- Informal Parking (i.e. parking alongside the kerb which is unrestricted).

This qualitative assessment has also taken account of adjacent parking on side streets which is defined as alternative parking locations along side roads within 200 – 250m of the Proposed Scheme.

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 Scheme. 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.

6.4.6.2.2 Section 1 – Liffey Valley to Le Fanu Road

6.4.6.2.2.1 Pedestrian Infrastructure

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

- Footpaths with a minimum running width of 2.0m;
- Upgrade of roundabouts along Fonthill Road to protected junctions to provide direct, signalised pedestrian crossings on all arms of the junctions;
- Raised tables across side streets at minor junction to provide pedestrian priority;
- Upgrade of existing pelican crossing along Ballyfermot Road west of the Ballyfermot Road / Cherry Orchard Industrial Estate Site Access junction to a new direct Toucan crossing;
- Replacement of the signalised pelican crossing along Ballyfermot Road to the west of the Blackditch Drive priority junction, with a raised table crossing;
- Provision of a new raised table crossing along Ballyfermot Road to the west of the Ballyfermot Road / Clifden Road junction; and
- Removal of the existing pelican crossing along Ballyfermot Road west of the Ballyfermot Road / Le Fanu Road junction.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 1 of the Proposed Scheme are summarised in Table 6.26 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 Appendix A6.4.1 (Pedestrian Infrastructure Assessment) in Volume 4 of this EIAR.

Table 6.21: Section 1 – Significance of Effects for Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Magnitude and Type of Impact	Sensitivity	Significance of Impact
Fonthill Road Roundabout	A430-A500	E	A	High	High	Positive Profound
Fonthill Road Roundabout	A150-A200	E	A	High	Low	Positive Moderate
Fonthill Road / Coldcut Road	B-30-B30	E	B	Medium	Low	Positive Moderate
Coldcut Road / Dublin City Services Sports & Social Club entrance	B100-B120	D	B	Medium	Low	Positive Moderate
Coldcut Road / Coldcut Crescent	B390-B410	C	B	Low	Low	Positive Slight
Coldcut Road / Cloverhill Road	B450-B500	E	A	High	Medium	Positive Very Significant
Coldcut Road / Kennelsfort Road Upper / Ballyfermot Road	B720 - B750	E	A	High	Medium	Positive Very Significant
Mid-link crossing on Ballyfermot Road	B1020-B1040	C	A	Medium	Low	Positive Moderate
Ballyfermot Road / Cherry Orchard Industrial Estate Site Access	B1190-B1210	D	B	Medium	Low	Positive Moderate
Ballyfermot Road / Cherry Orchard Football Club Site Access	B1300-B1350	D	A	Medium	Low	Positive Moderate
Ballyfermot Road / Cherry Orchard Industrial Estate Site Access / 2 no. priority junctions	B1350-B1450	D	B	Medium	Low	Positive Moderate
Ballyfermot Road / Cleggan Park priority junction	B1500-B1550	C	B	Low	Medium	Positive Moderate
Mid-link crossing on Ballyfermot Road	B1700-B1720	B	A	Low	High	Positive Moderate
Mid-link crossing on Ballyfermot Road	B1870-B1890	N/A	A	High	Medium	Positive Very Significant
Ballyfermot Road / Clifden Road	B2000-B2040	C	A	Medium	Medium	Positive Significant
Ballyfermot Road / Drumfinn Road	B2090-B2130	C	A	Medium	High	Positive Very Significant
Mid-link crossing across Ballyfermot Road service road access	B2150-B2170	D	B	Medium	High	Positive Very Significant
Mid-link crossing on Ballyfermot Road	B2240-B2250	B	A	High	High	Positive Moderate
Mid-link crossing across Ballyfermot Road service road access	B2280-B2300	D	B	Medium	High	Positive Very Significant
Ballyfermot Road / Le Fanu Road	B2350-B2400	C	A	Medium	High	Positive Very Significant
Section Summary		**D**	**B**	**Medium**	**Medium**	**Positive Significant**

The contents of Table 6.261 demonstrate that the Proposed Scheme will have a positive long-term impact on the quality of the pedestrian infrastructure along Section 1 between Liffey Valley Shopping Centre and the Ballyfermot Road / Le Fanu Road junction during the Operational Phase.

The LoS during the Do Minimum scenario ranges between B and E, with 11 of the 20 impacted junctions along this section given low D / E ratings. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.16. The LoS will improve to an A/B rating at all impacted junctions in the

Do Something scenario. The proposed improvements to the existing pedestrian facilities include 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 2020) 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 Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor. 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 A6.4.1 (Pedestrian Infrastructure Assessment) in Volume 4 of this EIAR.

6.4.6.2.2.2 Cycling Infrastructure

The key cycling infrastructural changes along Section 1 of the Proposed Scheme are the following:

- Cycle lanes widths of 2.0m for the majority of Section 1.
- Upgrade of roundabouts along Fonthill Road to protected junctions for cyclists;
- Proposed changes to existing signalised junctions to feature continuous cycle lanes across all arms of the junction or feature green signal priority for cyclists;
- Upgrade of existing pelican crossing along Ballyfermot Road west of the Ballyfermot Road / Cherry Orchard Industrial Estate Site Access junction to a new direct Toucan crossing;
- Routing of cycle tracks behind on street parking to ensure cyclist safety; and
- Proposed provision of continuous cycle bypasses at all bus stops.

Along Section 1, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle tracks will also be protected by a 120mm kerb on the carriageway side to provide segregation from vehicles.

The contents of Table 6.22 outline the cycling qualitative assessment along Section 1 of the Proposed Scheme, with reference to the accompanying sensitivity for each section and the resultant Significance of Impact.

Table 6.22: Section 1 - Cycling Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact	Sensitivity of Environment	Significance of Effect
Liffey Valley Roundabout to R833 Coldcut Road	A0 - A500	C	A	Medium	High	Positive Very Significant
Fonthill Road to Ballyfermot Road	B0 - B 800	D	A	High	High	Positive Profound
Coldcut Road to Le Fanu Road	B800 - B2400	D	B	Medium	High	Positive Very Significant
Section Summary		**D**	**A**	**High**	**High**	**Positive Profound**

The content of Table 6.22 demonstrates the Proposed Scheme will have a positive long-term impact on the cycling environment between Liffey Valley and Le Fanu Road. The Do Minimum LoS is D which has been determined using the previously referenced assessment criteria set out in Table 6.18.

In the Do Something scenario, the LoS improves to A along the majority of Section 1 of the Proposed Scheme, as a result of the provision of well-separated cycle lanes in both directions which traverse priority junctions and continue through signalised junctions with protected treatments as part of the Proposed Scheme. Between Coldcut Road and Le Fanu Road, the cycle lane width reduces to 1.5m at a minimum.

Overall, it is anticipated that there will be **Positive, Profound and Long-term effect** to the quality of the cycling infrastructure along Section 1 of the Proposed Scheme, during the Operational Phase. A detailed breakdown of the assessment along each section can be found in Appendix A6.4.2 (Cycling Infrastructure Assessment) in Volume 4 of this EIAR.

The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.4.6.2.2.3 Bus Infrastructure

There are currently a total of 15 bus stops along Section 1, eight inbound and seven outbound. Under the Proposed Scheme, there will be a total of 16 bus stops along Section 1 with one additional outbound stop than in the Do Minimum. The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.23 outline a summary of the improvements to the bus stop infrastructure along Section 1 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.23: Section 1 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	4	27%	16	100%	It is proposed that all bus stops provide real-time information.
Timetable information	13	87%	16	100%	It is proposed that all bus stops provide timetable information.
Shelter	11	73%	16	100%	It is proposed that all bus stops provide a shelter.
Seating	10	67%	16	100%	It is proposed that all bus stops provide seating.
Accessible Kerbs	4	27%	16	100%	It is proposed that all bus stops provide accessible kerbs.
Indented Drop Off Area	1	7%	0	0%	All proposed bus stops will be located inline within bus lanes.
Total Stops	**15**		**16**		One additional outbound stop than Do Minimum.

The contents of Table 6.23 indicate that there are significant improvements to the bus stop facilities along Section 1 of the Proposed Scheme. It is proposed that all bus stops will be provided inline within dedicated bus lanes along the entirely of the corridor, meaning that buses will not incur delay when setting off after picking up passengers. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 1 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

Taking into account the provision of bus lanes, and bus stop provision and facilities outlined within this section, the contents of Table 6.24 outline the bus qualitative assessment along Section 1 of the Proposed Scheme.

Table 6.24: Section 1 - Bus Qualitative Impact during Operational Phase

Section	Chainage	Description of Impact	Magnitude of Impact	Sensitivity	Significance of Effect
Liffey Valley to Le Fanu Road	A0 – B2400	• Number of stops increased from 15 to 16 whilst optimising spacing and journey times; • Bus stops are located in more convenient locations for communities and access to signalised crossings; • Significant improvements to bus stop facilities; and • Bus priority (bus lanes / bus gates / signal controlled priority) provided along the majority of the corridor.	High	High	Positive Profound

As indicated in Table 6.24, the Proposed Scheme improves the quality of existing bus infrastructure along Section 1 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is High Positive. The sensitivity of the receiving environment is predominately categorised as 'high'. This results in a **Positive, Profound and Long-term effect** on this section.

6.4.6.2.2.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 1. The main areas of parking changes are as follows:

- The reduction from six to five informal general residential parking spaces on the northern side of Ballyfermot Road between Cherry Orchard Service station and Cleegan Park. At this location, it is proposed to remove the existing parallel access roads and the formalise the parking arrangement, creating space to provide segregated bus and cycle infrastructure. There are approximately 50 parking spaces along the side streets within 100m of this location. Therefore, the loss one space at this location is considered to have a **Negligible and Long-term effect**;
- The reduction from 50 to 47 informal general residential parking space on the northern side of Ballyfermot Road between Cleegan Park and Clifden Road. At this location, it is proposed to remove the existing parallel access roads and the formalise the parking arrangement, creating space to provide segregated bus and cycle infrastructure. The majority of residential properties adjacent to these lost spaces have off-street parking within driveways and there are approximately 390 parking spaces along the side streets within 100m of this location. Therefore, the loss six spaces at this location is considered to have a **Negligible and Long-term effect**;
- The reduction from 35 to 29 informal general residential parking space on the southern side of Ballyfermot Road between Cleegan Park and Clifden Road through the removal of existing parallel access roads and formalisation of parking. This revised parking arrangement enables the creation of space to provide segregated bus and cycle infrastructure and formalised parking bays and results in the loss of six car parking spaces at this location. The majority of residential properties adjacent to these lost spaces have off-street parking within driveways and there are approximately 250 parking spaces along the side streets within 100m of this location. Considering this, the impact of this loss of parking is considered to have a **Negligible and Long-term effect**;
- The removal of 25 informal general residential parking space on the southern side of Ballyfermot Road between Clifden Road and the mid-link pedestrian crossing through the removal of the existing parallel access road. This removal enables the creation of space to provide segregated bus and cycle infrastructure. The majority of residential properties adjacent to these lost spaces have off-street parking within driveways and there are approximately 85 parking spaces along the side streets within 100m of this location. Considering this, the impact of removing 25 spaces is considered to have a **Negative, Slight and Long-term effect**;
- The removal of three Pay and Display commercial parking spaces on the southern side of Ballyfermot Road at O'Shea's. This removal enables the creation of space to provide segregated bus and cycle infrastructure. Due to the availability of parking spaces on the surrounding residential streets and the availability of 14 Pay and Display spaces further east on the approach to R833 Ballyfermot Road / Le Fanu Road Junction, the impact of this loss of parking is considered to have a **Negligible and Long-term effect**;
- The reduction from 26 to 17 Pay and Display commercial parking spaces on the southern side of Ballyfermot Road between the mid-link pedestrian crossing and Le Fanu Road. The existing parking

arrangement at this location comprises angled parking spaces and it is proposed to revise the arrangement to create space to provide segregated bus and cycle infrastructure and formalised parallel parking bays. This will result in the loss of 9 car parking spaces at this location and the relocation of the disabled parking bay approximately 30m east of the current location. There are approximately 55 parking spaces on side streets within 100m of this location. Therefore, the loss of 9 parking spaces at this location is considered to have a **Negative, Slight and Long-term effect**; and

- The removal of nine Pay and Display commercial parking spaces on the northern side of Ballyfermot Road on the northwest corner of R833 Ballyfermot Road / Le Fanu Road Junction. This removal enables the creation of space to provide segregated bus and cycle infrastructure. There are approximately 55 parking spaces on side streets within 100m of this location and 14 Pay and Display spaces retained to the south of this location. Therefore, the removal of nine parking spaces at this location is considered to have a **Negative, Slight and Long-term effect**.

Table 6.25 presents a summary of the parking and loading spaces during the Do Minimum and Do Something scenarios and the resulting change in parking along Section 1.

Table 6.25: Section 1 – Overall Changes in Parking / Loading Spaces

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
R833 Ballyfermot Road (including local access road)	Informal	147	112	-35
	Paid	38	17	-21
	Disabled	1	0	-1
Side streets	Informal Parking (approximate)	1,680	1,680	0
Total		**1,866**	**1,809**	**-57**

With the change in parking provisions at the locations specified, the Proposed Scheme will provide substantial improvements to sustainable transport infrastructure. Considering the overall retention of 1,809 spaces compared to a loss of 57 spaces, the Proposed Scheme is considered to have a **Negative, Slight and Long-term effect** along Section 1.

6.4.6.2.3 Section 2 – Le Fanu Road to Sarsfield Road

6.4.6.2.3.1 Pedestrian Infrastructure

The key infrastructural changes to pedestrian links along Section 2 of the Proposed Scheme are the following:

- The majority of footpaths along Section 2 with a minimum running width of 2.0m;
- Upgrade the existing Kylemore Road / Ballyfermot Road roundabout junction to a signalised junction to provide direct, signalised pedestrian crossings on all arms of the junctions;
- Raised tables across side streets at minor junction to provide pedestrian priority;
- Upgrade of existing pelican crossings along Ballyfermot Road to provide a new direct Toucan crossing;
- Provision of new toucan crossings along Ballyfermot Road to the east of the Ballyfermot Road / Garryowen Road junction and to the west of the Ballyfermot Road / O'Hogan Road junction; and
- Closure of O'Hogan Road, reducing pedestrian and vehicle interaction along the westbound carriageway.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 2 of the Proposed Scheme are summarised in Table 6.26 along with the accompanying sensitivity for each junction and the resultant significance of impact. A detailed breakdown of the assessment at each junction can be found in Appendix A6.4.1 (Pedestrian Infrastructure Assessment) in Volume 4 of this EIAR.

Table 6.26: Section 2 - Significance of Effects for Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Magnitude and type of impact	Sensitivity	Significance of Impact
Ballyfermot Road / Colepark Avenue	B2480- B2500	E	B	Medium	High	Positive Very Significant
Ballyfermot Road / Ballyfermot Parade	B2530- B2560	D	B	Medium	High	Positive Very Significant
Ballyfermot Road / Colepark Drive Avenue	B2750-B2770	D	B	Medium	High	Positive Very Significant
Kylemore Road / Ballyfermot Road	D0 - B2900	C	A	Medium	High	Positive Very Significant
Mid-link crossing on Ballyfermot Road	B3020-B3040	B	A	Low	Medium	Positive Moderate
Mid-link crossing on Ballyfermot Road	B3230-B3250	B	A	Low	Medium	Positive Moderate
Ballyfermot Road / Garryowen Road	B3300 - B3330	C	B	Low	Medium	Positive Moderate
Mid-link crossing: Ballyfermot Road	B3370	N/A	A	High	Medium	Positive Very Significant
Ballyfermont Road / O'Hogan Road	B3550-B3580	D	B	Medium	Low	Positive Moderate
Mid-link crossing: Ballyfermot Road	B3820	N/A	A	High	Low	Positive Moderate
Sarsfield Road / St Laurence's Road	B3830-B3850	D	B	Medium	Low	Positive Moderate
Sarsfield Road / Landen Road	B4270 - B4300	D	B	Medium	Negligible	Not Significant
Sarsfield Road / St Marys Avenue West	B4320 - B4350	D	B	Medium	Low	Positive Moderate
Ballyfermot Road / Sarsfield Road / Con Colbert Road	B4500 - B4600	E	A	High	Low	Positive Moderate
Sarsfield Road / Inchicore Road / Grattan Crescent	E400 - E457	F	A	High	High	Positive Profound
Section Summary		**D**	**B**	**Medium**	**Medium**	**Positive Significant**

The content of Table 6.26 demonstrates that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure along Section 2 of the Proposed Scheme during the Operational Phase.

The LoS during the Do Minimum scenario ranges between B and F, with nine of the 15 junctions along this section given a D or lower. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.15. The LoS will improve to an A / B rating at all 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 2020) 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 Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor. 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 A6.4.1 (Pedestrian Infrastructure Assessment) in Volume 4 of this EIAR.

6.4.6.2.3.2 Cycling Infrastructure

The key cycling infrastructural changes along Section 2 of the Proposed Scheme are the following:

- Increase in cycle lane widths along Section 2 to provide cycle lanes between 1.5m to 2.0m in width where possible;
- Upgrade the existing Kylemore Road / Ballyfermot Road roundabout junction to a protected junction for cyclists;
- Proposed changes to existing signalised junctions to feature continuous cycle lanes across all arms of the junction or feature green signal priority for cyclists;
- Provision of cycle tracks along both sides of Kylemore Road from south of the Chapelizod Hill Road to Ballyfermot Road;
- Upgrade of existing pelican crossings along Ballyfermot Road to provide a new direct Toucan crossing;
- Provision of new toucan crossings along Ballyfermot Road to the east of the Ballyfermot Road / Garryowen Road junction and to the west of the Ballyfermot Road / O'Hogan Road junction; and
- Proposed provision of continuous cycle bypasses at all bus stops.

Along Section 2, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle tracks will also be segregated from vehicles by a 120mm kerb on the carriageway side.

The contents of Table 6.27 outline the cycling qualitative assessment along Section 2 of the Proposed Scheme, with reference to the accompanying sensitivity for each section and the resultant Significance of Impact.

Table 6.27: Section 2 - Cycling Impact during Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact	Sensitivity of Environment	Significance of Effect
Le Fanu Road to Kylemore Road	B2400 - B2800	D	B	Medium	High	Positive Very Significant
Chapelizod Rd to Ballyfermot Road	D0 - D448	D	C	Low	High	Positive Moderate
Kylemore Road to Saint Laurence's Road	B2800 - B3800	D	B	Medium	High	Positive Very Significant
Saint Laurence's Road to Con Colbert Road	B3800 - B4700	D	B	Medium	Low	Positive Moderate
R833 Sarsfield Road: Con Colbert Road to Inchicore Road	E0 - E457	D	D	Negligible	High	Not Significant
Section Summary		**D**	**C**	**Low**	**High**	**Positive Moderate**

The content of Table 6.27 demonstrates that the Proposed Scheme will have a long-term positive impact on the quality of the cycling infrastructure along Section 2 of the Proposed Scheme. The Do Minimum LoS is D which has been determined using the previously referenced assessment criteria set out in Table 6.18.

In the Do Something scenario, the LoS improves to an overall C. Three of the five segments improve from a D to a B LoS rating, as a result of the provision of well-separated cycle lanes in both directions which traverse priority junctions and continue through signalised junction with protected treatment as part of the Proposed Scheme.

Along Kylemore Road between Chapelizod Hill Road to Ballyfermot Road, cycle tracks are proposed on both sides of the carriageway where there is currently limited cycling infrastructure provision. Cyclists have priority at junctions along Kylemore Road with the exception of at the Kylemore Road / Chapelizod Hill Road / Le Fanu Road Junction where no changes to the junction are proposed.

Along R833 Sarsfield Road, between Con Colbert Road and Inchicore Road, the LoS rating is D in the Do Minimum and Do Something scenario. There are no changes proposed to cycling infrastructure due to width constraints associated with the Sarsfield Road Bridge, a single span simply supported steel bridge, which crosses the railway line. Along this section, the westbound bus gate at the Sarsfield Road / Inchicore Road / Grattan Crescent junction is retained. Furthermore, there is an alternative cycle route into the city centre via Inchicore Road.

Overall, it is anticipated that there will be **Positive, Moderate and Long-term effect** to the quality of the cycling infrastructure along Section 2 of the Proposed Scheme, during the Operational Phase. A detailed breakdown of the assessment along each section can be found in Appendix A6.4.2 (Cycling Infrastructure Assessment) in Volume 4 of this EIAR.

The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.4.6.2.3.3 Bus Infrastructure

There is currently a total of 16 bus stops along Section 2, eight inbound and eight outbound. Under the Proposed Scheme, there will be a total of 14 bus stops along Section 2 with one fewer inbound, and one fewer outbound stops, than in the Do Minimum. The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.28 outline a summary of the improvements to the bus stop infrastructure along Section 2 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.28: Section 2 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	3	19%	14	100%	It is proposed that all bus stops provide real-time information.
Timetable information	15	94%	14	100%	It is proposed that all bus stops provide timetable information.
Shelter	10	63%	14	100%	It is proposed that all bus stops provide a shelter.
Seating	9	56%	14	100%	It is proposed that all bus stops provide seating.
Accessible Kerbs	5	31%	14	100%	It is proposed that all bus stops provide accessible kerbs.
Indented Drop Off Area	0	0%	0	0%	All proposed bus stops will be located inline within bus lanes.
Total Stops	**16**		**14**		Two fewer stops than the Do Minimum.

The contents of Table 6.28 indicate that there are improvements to the bus stop facilities along Section 2 of the Proposed Scheme. All stops along this section will be inline, within dedicated bus lanes along the entirety of the corridor. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 2 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

Taking into account the provision of bus lanes, and bus stop provision and facilities outlined within this section, the contents of Table 6.29 outline the bus qualitative assessment along Section 2 of the Proposed Scheme.

Table 6.29: Section 2 - Bus Qualitative Impact during Operational Phase

Section	Chainage	Description of Impact	Magnitude of Impact	Sensitivity	Significance of Effect
Le Fanu Road to Sarsfield Road	B2400–E457	• Number of stops reduced from 16 to 14 whilst optimising spacing and journey times; • Bus stops are located in more convenient locations for communities and access to signalised crossings; • Significant improvements to bus stop facilities; and • Bus priority (bus lanes / bus gates / signal controlled priority) provided along the majority of the corridor.	Medium	High	Positive Very Significant

The Proposed Scheme improves the quality of existing bus infrastructure along Section 2 of the Proposed Scheme, which will provide long term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is Medium Positive. The sensitivity of environment rating is predominately categorised as 'high'. This results in a **Positive, Very Significant and Long-term effect** on this section.

6.4.6.2.3.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 2. The main areas of parking changes are as follows:

- The reduction from 39 to 29 Pay and Display commercial parking spaces on the eastern side of Ballyfermot Parade. This change is to facilitate the provision of safe footpaths and cycle tracks at this location. Whilst 10 Pay and Display parking spaces will be lost at this location, the loading bays and disabled parking spaces will be retained / relocated within 30m of the current location and there are approximately 275 parking spaces on side streets within 100m of this location. Therefore, the loss of 10 parking spaces at this location is considered to have a **Negative, Slight and Long-term effect**;
- The reduction from 10 to eight informal parking spaces on the north-western corner of the R833 Ballyfermot Road / R112 Kylemore Road Roundabout adjacent to the Church of Our Lady of the Assumption. It is proposed to upgrade the existing roundabout to a signalised protected junction which will improve pedestrian, cyclist and bus infrastructure whilst parking at this location will be formalised. It is proposed to provide additional parking to the south of this location and therefore, the loss of two spaces is considered to have a **Negligible and Long-term effect**;
- The provision of three additional informal parking spaces on the south-western corner of the R833 Ballyfermot Road / R112 Kylemore Road Roundabout. It is proposed to upgrade the existing roundabout to a signalised protected junction which will improve pedestrian, cyclist and bus infrastructure whilst parking at this location will be formalised. The additional parking spaces at this location take the total number spaces on the south-western corner from five to eight. The gain of three spaces is considered to have a **Negligible and Long-term effect**;
- The provision of two additional informal parking spaces on the south-eastern corner of the R833 Ballyfermot Road / R112 Kylemore Road Roundabout. It is proposed to upgrade the existing roundabout to a signalised protected junction which will improve pedestrian, cyclist and bus infrastructure whilst parking at this location will be formalised. The additional parking spaces at this take the total spaces on the south-eastern corner from eight to 10. The gain of two spaces is considered to have a **Negligible and Long-term effect**;
- The provision of two additional informal parking spaces on R112 Kylemore Road (northbound). At this location it is proposed to formalise the existing parking provision to provide a cycle track along R112 Kylemore Road. Through the formalisation of parking, the additional spaces at this location take the total from 20 to 22. The gain of two spaces is considered to have a **Negligible and Long-term effect**;
- The reduction from 24 to 22 informal parking spaces on R112 Kylemore Road (southbound). At this location it is proposed to formalise the existing parking provision to provide a cycle track along R112 Kylemore Road. Through the formalisation of parking, it is proposed to remove four parking spaces at this location. It is proposed to provide of two additional informal spaces along the northbound carriageway and there are approximately 70 parking spaces on side streets within 100m of this

location. Therefore, the loss of four spaces is considered to have a **Negligible and Long-term effect**;

- The reduction from 25 to 20 informal commercial parking spaces on the northeast arm of R833 Sarsfield Road / First Avenue Junction. This reduction enables the creation of space to provide segregated bus and cycle infrastructure. Due to the retention of 20 spaces and approximately 55 parking spaces on side streets within 100m of this location, the impact of this loss of parking is considered to have a **Negligible and Long-term effect**; and
- The removal of two informal parking spaces outside Sarsfield Medical Centre, along R833 Sarsfield Road. It is proposed to remove both of the existing spaces, to enable changes to R833 Sarsfield Road, which will provide a relocated bus stop, bus priority and enhanced pedestrian and cyclists facilities. Noting the availability of parking spaces along the adjacent residential streets, the impact of this loss is considered to be **Negative, Slight and Long-term**.

Table 6.30: Section 2 – Overall Changes in Parking / Loading Spaces

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
R833 Ballyfermot Road	Disabled	2	2	0
	Informal	23	26	3
	Loading	4	4	0
	Paid	86	76	-10
	Taxi	5	5	0
R112 Kylemore Road	Informal	44	44	0
R833 Sarsfield Road	Informal	27	20	-7
Side streets	Informal Parking (approximate)	690	690	0
Total		**881**	**867**	**-14**

With the change in parking provisions at the locations specified, the Proposed Scheme will provide substantial improvements to sustainable transport infrastructure. Considering the overall retention of 867 spaces compared to a loss of 14 spaces, the Proposed Scheme is considered to have a **Negative, Slight and Long-term effect** along Section 2.

6.4.6.2.4 Section 3 – Sarsfield Road to City Centre

6.4.6.2.4.1 Pedestrian Infrastructure

The key infrastructural changes to the pedestrian link along Section 3 of the Proposed Scheme are the following:

- General widening along the section to ensure the desirable minimum footway width for the Proposed Scheme is 2.0m or an absolute minimum width of 1.8m at constrained areas;
- Widening of the footpath along R839 Grattan Crescent as well as the provision of a new toucan crossing between Grattan Crescent Park and Inchicore National School;
- New toucan crossing provided on R810 James Street to the east of Ceannt Fort
- Raised tables across side streets at minor junction to provide pedestrian priority;
- Proposed speed limit reduction from 50km/h to 30km/h along Old Kilmainham, Mount Brown and James Street and from 40km/h to 30km/h along Thomas Street; and
- Significant works at the R810 Thomas Street / R108 High Street (Cornmarket) Junction to create additional space for pedestrians at the junction.

The assessment of the qualitative impacts on the walking infrastructure for Section 3 of the Proposed Scheme is summarised in Table 6.31 along with the accompanying sensitivity for each junction and the resultant significance of impact. A detailed breakdown of the assessment at each junction can be found in Appendix A6.4.1 (Walking Infrastructure Assessment).

Table 6.31: Section 3 - Significance of Effects for Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Magnitude and type of impact	Sensitivity	Significance of Impact
Memorial Road / Con Colbert Road	B5080-B5110	E	B	Medium	Medium	Positive Significant
Memorial Road / Inchicore Road	B5100 - B5200	E	A	High	Medium	Positive Very Significant
Mid-link crossing: Grattan Crescent	B5490	N/A	A	High	Medium	Positive Very Significant
Grattan Crescent / Grattan Crescent Park Entrance	B5500-B5510	C	B	Low	Medium	Positive Moderate
Inchicore Terrace South	B5550-B5560	D	C	Low	Low	Positive Slight
Grattan Crescent / Emmet Road / Tyrconnell Road	B 5600 - B5700	C	A	Medium	High	Positive Very Significant
Emmet Road / Spa Road	B5720-B5740	C	B	Low	Low	Positive Slight
Emmet Road / St Vincent's Street West	B5800 - B5850	D	B	Medium	Low	Positive Moderate
Mid-link crossing: Emmet Road	B6040	C	A	Medium	Low	Positive Moderate
Emmet Road / Myra Close	B6130 - B6200	D	B	Medium	Medium	Positive Significant
Mid-link crossing: Emmet Road	B6310	B	A	Low	Medium	Positive Moderate
Emmet Road / Turvey Avenue / Luby Road	B6300 - B6350	D	B	Medium	Medium	Positive Significant
Mount Brown / Unnamed Road	B7040-B7060	F	C	Medium	High	Positive Very Significant
Mount Brown / Unnamed Road	B7100 – B7120	D	B	Medium	High	Positive Very Significant
Mid-link crossing: James Street	B7400	N/A	A	High	High	Positive Profound
James's Street / Bow Lane West	B7700 - B7800	D	B	Medium	Low	Positive Moderate
James's Street / Echlin Street	B7900 - B7930	C	B	Low	Low	Positive Slight
James's Street / Guinness Pharmacy Site Entrance	B7930-B7940	E	B	Medium	Low	Positive Moderate
Bridgefoot Street / Thomas Street / Thomas Court	B8350 - B8400	E	C	Medium	Medium	Positive Significant
R810 Thomas Street / R108 High Street (Cornmarket) Junction	B8800 - B8900	E	A	High	High	Positive Profound
Section Summary		**D**	**B**	**Medium**	**Medium**	**Positive Significant**

The content of Table 6.31 demonstrates that the Proposed Scheme will have a positive long-term impact on the quality of the pedestrian infrastructure along Section 3 of the Proposed Scheme during the Operational Phase.

The LoS during the Do Minimum scenario ranges from B to F, with 12 of the 21 impacted junctions along this section given the low D / E / F 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 / B rating at 17 of the 21 impacted junctions. Three junctions are rated as a C in the Do Something, these junctions improve from a D, E and F rating in the Do Minimum. This is as 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 2020) 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 3 of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor. 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 A6.4.1 (Pedestrian Infrastructure Assessment) in Volume 4 of this EIAR.

6.4.6.2.4.2 Cycling Infrastructure

The following section sets out the qualitative impacts on the cycling infrastructure along Section 3 of the Proposed Scheme. The results are summarised in Table 6.32, along with the accompanying sensitivity for each section and the resultant significance of impact.

The key cycling infrastructure changes along Section 3 of the Proposed Scheme can be summarised as follows:

- Proposed 2.0m wide cycle tracks to be provided on both sides of R839 Memorial Road between R148 Con Colbert Road and R839 Inchicore Road;
- Proposed combined bus and cycle lanes to be provided along southbound link of R839 Grattan Crescent between Sarsfield Road and R810 Emmet Road. Therefore, replacing the disconnected combined use bus lanes currently in place along R839 Grattan Crescent;
- Eastbound and westbound combined use bus lanes to be provided along sections of R810 Emmet Road between St. Vincent Street West and R111 South Circular Road;
- Proposed Quiet Street to the south of the Proposed Scheme, along Newington Lane, Basin View, St. James's Avenue, Grand Canal Place and Echlin Street. Local vehicular access will continue to be provided but through-traffic will not be permitted. A contra-flow cycle lane is proposed along St. James's Avenue;
- Proposed changes to existing signalised junctions of R839 Memorial Road / R839 Inchicore Road Junction, R810 Thomas Street / Watling Street Junction, R810 Thomas Street / Bridgefoot Street Junction, and R810 Thomas Street / High Street Junction, to feature green signal priority for cyclists; and
- Due to the high foot traffic at the Cornmarket Junction, the existing kerb lines have been retained where practicable to retain the existing pedestrian areas. To accommodate standard carriageway widths, cycleways have been designed to minimum 1.5m widths.

Along Section 3, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation (as is the case in some areas of the baseline environment) is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle tracks will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.32 outline the cycling qualitative assessment along Section 3 of the Proposed Scheme, which sets out the overall Do Minimum LoS and the Do Something LoS and the description of impact. Please refer to Appendix A6.4.2 (Cycling Infrastructure Assessment) in Volume 4 of this EIAR which outlines in further detail the methodology behind each LoS rating given to the Do Minimum and Do Something scenarios.

Table 6.32: Section 3 - Cycling Impact during Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact	Sensitivity of Environment	Significance of Effect
Con Colbert Road to Inchicore Road	B5100 - B5200	D	B	Medium	Medium	Positive Significant
Memorial Road to Emmet Road	B5200 - B5600	D	D*	Negligible	High	Not Significant
R810 Emmet Road / Grattan Crescent to South Circular Road	B5600 - B6600	D	D*	Negligible	High	Not Significant
South Circular Road to Bow Lane West	B6600 - B7850	D	D*	Negligible	High	Not Significant
Quiet Street: Newington Lane / Basin View / St. James's Avenue / Grand Canal Place / Echlin Street	B7550-B7900	D	B**	Medium	High	Positive Very Significant
Bow Lane West to St Augustine Street	B7850 - B8750	D	B	Medium	Low	Positive Moderate
St Augustine Street to High Street	B8750 - B9017	C	B	Low	High	Positive Moderate
Section Summary		**D**	**C**	**Low**	**High**	**Positive Moderate**

*although no bespoke cycle provision is offered in these sections, local bus gates will reduce through traffic creating an environment more conducive to cycling.
**although there is limited bespoke cycle provision offered along these streets, the creation of a Quiet Street with restricted vehicle flow will greatly reduce traffic speeds resulting in an environment more conducive to cycling and offers an alternative route to James's Street.

The content of Table 6.32 demonstrates that the Proposed Scheme will have a **Positive, Moderate and Long-term effect** on the cycling environment along Section 3 of the Proposed Scheme, between Sarsfield Road and the City Centre.

The LoS during the Do Minimum scenario ranges between a C and D rating, with six of the seven sections scoring a low D rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.18.

In the Do Something scenario, the LoS increases to a B rating in all instances where improvement occurs along four of the seven sections. This is due to the proposed improvements to the existing cycling facilities in the form of increased segregation, improvements to the cycle way widths and cycling priority at junctions. Three locations see no change in the LoS rating however, whilst no bespoke cycle provision is offered in these locations as part of the Proposed Scheme, local bus gates will greatly reduce through traffic creating an environment more conducive to cycling.

The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.4.6.2.4.3 Bus Infrastructure

It is proposed that there will be a total of 22 bus stops along Section 3 of the Proposed Scheme – 11 inbound and 11 outbound stops. There is one fewer outbound stop than in the Do Minimum. The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.33 outline a summary of the improvements to the bus stop infrastructure along Section 3 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.33: Section 3 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	13	57%	22	100%	It is proposed that all bus stops provide real-time information.
Timetable information	21	91%	22	100%	It is proposed that all bus stops provide timetable information.
Shelter	13	57%	21	100%	It is proposed that an additional 10 out of the total 21 bus stops long this section is to be provided with shelter.
Seating	9	39%	22	100%	It is proposed that an additional 14 out of the total 22 bus stops long this section is to be provided with seating.
Accessible Kerbs	8	35%	22	100%	It is proposed that all bus stops provide accessible kerbs.
Indented Drop Off Area	1	4%	0	100%	It is proposed to remove 1 indented bus bay. The majority of proposed bus stops are within bus lanes or within areas bounded by bus gates and hence do not impact the flow of general traffic.
Total Stops	**23**		**22**		One fewer outbound stop than Do Minimum.

The content of Table 6.33 demonstrates there are significant improvements to the bus stop facilities along Section 3 of the Proposed Scheme. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 3 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

Taking into account the provision of bus lanes, and bus stop provision and facilities outlined within this section, Table 6.34 outlines the bus qualitative assessment along Section 3 of the Proposed Scheme.

Table 6.34: Section 3 - Bus Qualitative Impact during Operational Phase

Section	Chainage	Description of Impact	Magnitude and Type of Impact	Sensitivity	Significance of Impact
Sarsfield Road to City Centre	B5100–B9017	• Number of stops rationalised from 23 to 22, to optimise spacing and journey times; • Bus stops are located in more convenient locations for communities and access to signalised crossings; • Significant improvements to bus stop facilities; and • Bus priority (bus lanes / bus gates / signal controlled priority) provided along the majority of the corridor.	Medium	High	Positive Very Significant

As indicated in Table 6.34, the Proposed Scheme improves the quality of existing bus infrastructure along Section 1 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is Medium Positive. The sensitivity of environment rating is predominately categorised as 'high'. This results in a **Positive, Very Significant and Long-term effect** on this section.

6.4.6.2.4.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 3. The main areas of parking changes are as follows:

- The removal of nine Pay and Display parking spaces on the western side Grattan Crescent, behind Inchicore National School, to facilitate combined bus and cycle lanes in both directions and

enhanced pedestrian facilities. The disabled parking bay at this location will be relocated approximately 10m to the north of the current position. There are over 30 parking spaces on side streets within 100m of this location. Considering this, the impact of this loss of parking is considered to have a **Negative, Slight and Long-term effect**;

- The reduction from seven to five Pay and Display parking spaces on the eastern side Grattan Crescent, adjacent to Grattan Crescent Park, to facilitate combined bus and cycle lanes in both directions and enhanced pedestrian facilities. The two disabled bays at this location will be relocated approximately 10m to the north of the current position. Five Pay and Display parking spaces will be retained and there are over 30 parking spaces on side streets within 100m of this location. Considering this, the impact of this loss of parking is considered to have a **Negligible and Long-term effect**;
- The removal of two "Pay and Display" parking spaces at the lower east layby along Grattan Crescent to provide bus priority and enhanced pedestrian facilities. Considering there are over 30 parking spaces on side streets within 100m of this location, the impact of losing two spaces at this location is considered to have a **Negligible and Long-term effect**;
- The removal of three permit parking spaces along R810 Emmet Road, between Grattan Crescent and Spa Road, to enable changes to R810 Emmet Road which will provide enhanced pedestrian facilities. There are over 30 parking spaces on side streets within 100m of this location. Therefore, the impact of losing three spaces at this location is considered to have a **Negligible and Long-term effect**;
- The reduction from seven to three permit parking spaces along R810 Emmet Road, between Spa Road and St. Vincent Street West, to provide bus priority and enhanced pedestrian facilities. Three permit parking spaces will be retained and there are over 30 parking spaces within 100m of this location on surrounding streets. Therefore, the impact of losing three spaces at this location is considered to have a **Negligible and Long-term effect**;
- The reduction from 19 to 10 permit parking spaces along R810 Emmet Road, between St. Vincent Street West and Camac Close, to provide bus priority and enhanced pedestrian facilities. 11 permit parking spaces will be retained and there are over 50 parking spaces on side streets within 100m of this location. Therefore, the impact of losing eight spaces at this location is considered to have a **Negative, Slight and Long-term effect;**
- The removal of nine permit parking spaces along R810 Emmet Road, between St. Vincent Street West and Bulfin Road, to provide bus priority and enhanced pedestrian facilities. 11 permit parking spaces opposite this location along the eastbound link of R810 Emmet Road will be retained. There are over 50 parking spaces on side streets within 100m of this location. Therefore, the impact of losing nine spaces at this location is considered to have a **Negative, Slight and Long-term effect**;
- The reduction from 19 to 12 permit parking spaces along R810 Emmet Road, between Camac Close and Myra Close, to provide bus priority and enhanced pedestrian facilities. The remaining 12 permit parking spaces will be retained and there are over 100 parking spaces on side streets within 100m of this location. Therefore, the impact of losing seven spaces at this location is considered to have a **Negative, Slight and Long-term effect;**
- The reduction from 38 to 18 permit parking spaces along R810 Emmet Road, between Bulfin Road and Luby Road, to provide bus priority and enhanced pedestrian facilities. The remaining 18 permit parking spaces will be retained and there are over 100 alternative parking spaces within 100m of this location on surrounding streets. Therefore, the impact of losing 20 spaces at this location is considered to have a **Negative, Slight and Long-term effect**;
- The increase from 18 to 34 permit parking spaces along R810 Emmet Road, between Myra Close and South Circular Road. Taking cognisance of the loss of 20 permit parking spaces along the westbound link between Bulfin Road and Luby Road and the availability of over 100 parking spaces on side streets within 100m of this location on surrounding streets, the impact is considered to have a **Positive, Slight and Long-term effect**;
- The increase from 15 to 16 permit parking spaces along R810 Emmet Road, between Luby Road and South Circular. Taking cognisance of the loss of 20 permit parking spaces along the westbound link between Bulfin Road and Luby Road and the availability of over 100 alternative parking spaces within 100m of this location on surrounding streets, the impact is considered to have a **Negligible and Long-term effect**;

- The removal of two Pay and Display parking spaces along Bow Lane West to provide enhanced pedestrian and cyclist facilities. There are over 30 alternative parking spaces within 100m of this location on surrounding streets. Therefore, the impact of losing two spaces at this location is considered to have a **Negligible and Long-term effect**;
- The removal of nine Pay and Display parking spaces along R810 James Street, between Echlin Street and Crane Street, to provide bus priority and enhanced pedestrian and cyclist facilities. There are over 40 alternative parking spaces within 100m of this location on surrounding streets and therefore the impact of losing nine spaces at this location is considered to have a **Negative, Slight and Long-term effect;**
- The removal of two Pay and Display parking spaces along R810 James Street, between Bow Lane West and Watling Street to provide bus priority and enhanced pedestrian and cyclist facilities. There are over 40 alternative parking spaces within 100m of this location on surrounding streets and therefore the impact of losing two spaces at this location is considered to have a **Negative, Slight and Long-term effect**;
- The removal of one loading bay along R810 James Street, between Bow Lane West and Watling Street to provide bus priority and enhanced pedestrian and cyclist facilities. One existing loading bay along Bow Lane West to the west is retained and therefore the impact of this loss is considered to have a **Negative, Slight and Long-term effect**;
- The removal of five Pay and Display parking spaces along R810 Thomas Street, between Thomas Court and Meath Street to provide bus priority and enhanced pedestrian and cyclist facilities. There are over 300 alternative parking spaces within 100m of this location on surrounding streets and therefore the impact of losing five spaces at this location is considered to have a **Negative, Slight and Long-term effect;**
- The reduction from two to one loading bay along R810 Thomas Street, between Thomas Court and Meath Street, to provide bus priority and enhanced pedestrian and cyclist facilities. One loading bay is retained / relocated and therefore the impact of this loss is considered to have a **Negligible and Long-term effect;**
- The removal of five Pay and Display parking spaces along R810 Thomas Street, between Meath Street and Francis Street, to provide enhanced pedestrian and cyclist facilities. There are over 300 alternative parking spaces within 100m of this location on surrounding streets and therefore the impact of losing seven spaces at this location is considered to have a **Negative, Slight and Long-term effect;**
- The removal of five loading bays along R810 Thomas Street, between Meath Street and Francis Street, to provide bus priority and enhanced pedestrian and cyclist facilities. Two loading bays are proposed to the east of this location (along the Cornmarket left turn slip) and therefore the impact of this loss is considered to have a **Negative, Slight and Long-term effect**;
- The removal of two loading bays along R810 Thomas Street, between Meath Street and Francis Street, to provide bus priority and enhanced pedestrian and cyclist facilities. One loading bay is retained to the east (along the Cornmarket left turn slip) and therefore the impact of this loss is considered to have a **Negative, Slight and Long-term effect;**
- The conversion of seven full-time taxi ranks to part-time taxi ranks along R810 Thomas Street, between Meath Street and Francis Street. This change is anticipated to have a **Negative, Slight and Long-term effect;**
- The removal of four Pay and Display parking spaces along the R810 Cornmarket left turn slip road to provide bus priority and enhanced pedestrian and cyclist facilities. There are over 50 alternative parking spaces within 100m of this location on surrounding streets and therefore the impact of losing five spaces at this location is considered to have a **Negligible and Long-term effect;**
- The provision of one disabled parking bays the R810 Cornmarket left turn slip road. Taking cognisance of the removal of two disabled parking bays between R810 Cornmarket and Winetavern Street along High Street, the impact of this gain is considered to have a **Negligible and Long-term effect;**
- The provision of two loading bays the R810 Cornmarket left turn slip road. Taking cognisance of the removal of one loading bay between Thomas Court and Meath Street, the removal of five loading bays between Meath Street and Francis Street, and the removal of three loading bays between R810 Cornmarket and Winetavern Street along High Street, the impact of this gain is considered to have a **Negligible and Long-term effect;**

- The removal of four Pay and Display parking spaces along High Street between R810 Cornmarket and Winetavern Street, to provide bus priority and enhanced pedestrian and cyclist facilities. There are approximately 12 alternative parking spaces within 100m of this location on surrounding streets and therefore the impact of losing four spaces at this location is considered to have a **Negligible and Long-term effect**
- The removal of three loading bays along High Street between R810 Cornmarket and Winetavern Street, to provide bus priority and enhanced pedestrian and cyclist facilities. Taking cognisance of the provision of two new loading bays further west along the Cornmarket left turn slip and the loss of loading bays between Thomas Court and Francis Street, the impact of this loss is considered to have a **Negative, Slight and Long-term effect**; and
- The reduction from 99 to 95 informal parking spaces along the proposed quiet route. It is proposed to remove nine spaces along this route - one along Newington Lane and eight spaces on Saint James's Avenue. To mitigate the loss of nine spaces, it is proposed to provide five additional spaces on Grand Canal Place and therefore the impact of this loss is considered to have a **Slight, Negative, and Long-term effect.**

The contents of Table 6.35 presents a summary of the parking and loading spaces during the Do Minimum and Do Something scenarios and the resulting change in parking along Section 3.

Table 6.35: Section 3 – Overall Changes in Parking / Loading Spaces

Street	Parking Type	Number Parking Spaces		
		Do Minimum	Do Something	Change
R839 Grattan Crescent	Paid	18	5	-13
	Disabled	3	3	0
	Loading	3	3	0
R810 Emmet Road	Paid	128	93	-35
	Loading	1	1	0
	Disabled	1	1	0
R810 Old Kilmainham / R810 Mount Brown	Paid	45	45	0
	Disabled	1	1	0
R810 James Street / Bow Lane West	Paid	13	0	-13
	Loading	1	0	-1
R810 Thomas Street / High Street	Paid	22	0	-22
	Loading	15	3	-12
	Disabled	3	1	-2
	Taxi	7	7	0
Quiet Route (Newinton Lane / Basin Street Lower / Saint James's Avenue / Grand Canal Place / Echlin Street)	Informal	99	95	-4
Side streets	Informal Parking (approximate)	1580	1580	0
Total		1940	1838	-102

Along Section 3 of the Proposed Scheme there is an overall retention of 1,838 spaces compared to a loss of 102. The Proposed Scheme is considered to provide significant improvements to walking, cycling and bus facilities encouraging the use of sustainable modes of transport, which will ultimately reduce the demand for private car parking, nevertheless the loss of 110 parking and loading spaces is still expected to have a **Negative, Slight and Long-term effect** along Section 3 of the Proposed Scheme.

6.4.6.2.5 Summary of Corridor-Wide Infrastructure Works

6.4.6.2.5.1 Pedestrian Infrastructure

Overall, the Proposed Scheme will provide an average decrease in footway area for pedestrians of 1% inbound and 1% outbound across the corridor compared to the Do Minimum scenario. The Proposed Scheme will increase

the number of controlled pedestrian crossings from 71 in the Do Minimum to 102 in the Do Something scenario, equating to a 44% increase. Additionally, there will be an increase in the number of raised table crossings on side roads from 22 in the Do Minimum to 69 in the Do Something scenario, equating to a 213% increase.

6.4.6.2.5.2 Cycling Infrastructure

The Proposed Scheme will provide 6.4km inbound and 6.4km outbound of segregated cycle facilities which is an increase from only 1.4km inbound and 0.8km outbound in the Do Minimum scenario. In turn, there will be a decrease in non-segregated cycle facilities in the Do Something scenario compared to the Do Minimum as these facilities will be upgraded to segregated facilities in most cases.

Overall, total cycle facilities (segregated and non-segregated) will be increased by 66% as part of the Proposed Scheme. The proportion of the corridor with segregated facilities (including quiet street treatment) will increase from 12% in the Do Minimum to 70% in the Do Something scenario.

With regards to cycle parking, 417 spaces are provided in the Do Minimum scenario. The Proposed Scheme will increase provision by 148% to a total of 1017 spaces across the entire corridor in the Do Something scenario.

6.4.6.2.5.3 Bus Priority Infrastructure

The Proposed Scheme will provide 6.5km inbound and 5.9km outbound of bus lanes across the corridor. This is an increased from 2.3km inbound and 1.9km outbound in the Do Minimum scenario. This contributes to an increase of 338% in total bus priority measures in both directions in the Do Something scenario compared to the Do Minimum. Overall, the Proposed Scheme will provide bus priority measures along the entirety of the corridor.

6.4.6.2.5.4 Parking and Loading

The total parking provision will be reduced by 175 spaces as part of the Proposed Scheme, the majority of these spaces (104) are paid spaces. The Proposed Scheme will also reduce the overall number of informal spaces (42), disabled spaces (two), loading bays (13) and seven taxi rank spaces converted to part time.

6.4.6.3 Quantitative Analysis

This quantitative assessment has been prepared with reference to the modelling outputs obtained from the four-tiered modelling approach outlined in Section 6.2. The following assessment topics have been considered:

- People Movement:
  - Peak Hour People Movement along the Proposed Scheme;
  - 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.

6.4.6.3.1 People Movement Assessment

6.4.6.3.1.1 Overview

In order to understand the benefit of the Proposed Scheme 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 ERM 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 of the number of people moved by each transport mode (i.e., Car, Bus, Walking and Cycling) along the corridor in the inbound and outbound direction. This metric is compared for the Do Minimum and Do Something scenarios in the AM and PM peak periods for each forecast year (2028, 2043); and
- People Movement by Bus
    - AM and PM peak hour Bus Passenger Loadings along the Proposed Scheme for each forecast year (2028, 2043).
    - Total Passengers Boarding Buses on bus routes that use any part of the Proposed Scheme for each forecast year (2028, 2043).

6.4.6.3.2 Peak Hour People Movement along the Proposed Scheme

To determine the impact that the Proposed Scheme has on modal share changes on the direct 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 ERM / LAM. The analysis compares the Do Minimum and Do Something scenarios both in the inbound and outbound direction in the AM (08:00 to 09:00) and PM (17:00 to 18:00) peak hours 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 BusConnects bus network proposals. It is acknowledged, therefore, that the assessment is conservative in terms of the level of people movement that is predicted in the Do Something scenario. 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 Scheme 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 Scheme, growth along this key corridor would continue to contribute to increased congestion and operational issues on the road network. The Proposed scheme delivers a reliable alternative to car-based travel that can support future sustainable growth and provide a positive contribution towards reducing carbon emissions.

6.4.6.3.2.1 2028 AM Peak Hour People Movement

Diagram 6.7 illustrates the People Movement by mode travelling along the Proposed Scheme inbound towards the city centre during the AM Peak Hour in 2028.

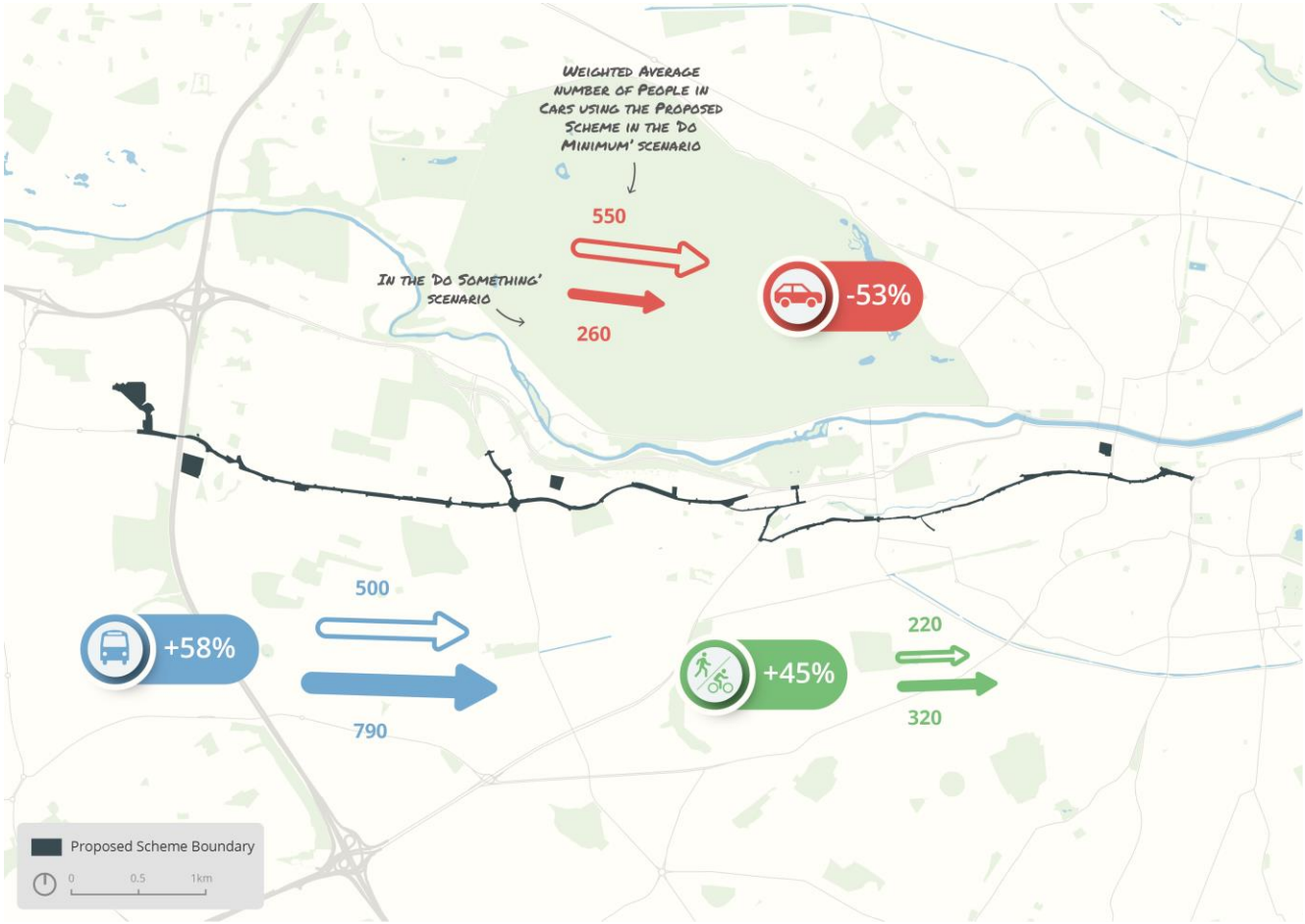


Diagram 6.7: People Movement by Mode travelling along the Proposed Scheme during 2028 AM Peak Hour

As indicated in Diagram 6.7, there is a reduction of 53% in the number of people travelling via car, an increase of 58% in the number of people travelling via bus and an increase of 45% in the number of people walking or cycling along the Proposed Scheme during the AM Peak Hour. It should be noted that the model predicts limited change in total walking trips between each scenario. This is due to the fact that walking trips in the Do Minimum scenario are also transferring to public transport and cycling as a result of the improved provision for these modes with any new pedestrians transferring from car replacing these trips.

The Proposed Scheme will facilitate a step change in the level of segregated cycling provision in comparison to existing conditions along the entire length of the corridor. The transport modelling undertaken, is therefore conservative in terms of the predicted cycling mode share. The Proposed Scheme has been designed to cater for much higher levels of cycling uptake and this will provide the opportunity for a significant increase in the movement of people travelling sustainably along the corridor, which would otherwise not be achieved in the absence of the Proposed Scheme.

The contents of Table 6.36 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate an 8% increase in total people moved as a result of the Proposed Scheme and 54% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.36: Modal Shift of 2028 AM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Inbound towards the City Centre	AM Peak Period	General Traffic	550	43%	260	19%	-290	-53%
		Public Transport	500	39%	790	58%	290	58%
		Walking	160	13%	170	12%	10	6%
		Cycling	60	5%	150	11%	90	150%
		Combined Walk/Cycle	220	17%	320	23%	100	45%
		Tot. Sustainable Modes	**720**	**57%**	**1,110**	**81%**	**390**	**54%**
		Total	**1,270**	**100%**	**1,370**	**100%**	**100**	**8%**

6.4.6.3.2.2 2028 PM Peak Hour People Movement

Diagram 6.8 illustrates the People Movement by mode travelling along the Proposed Scheme outbound from the city centre during the PM Peak Hour.

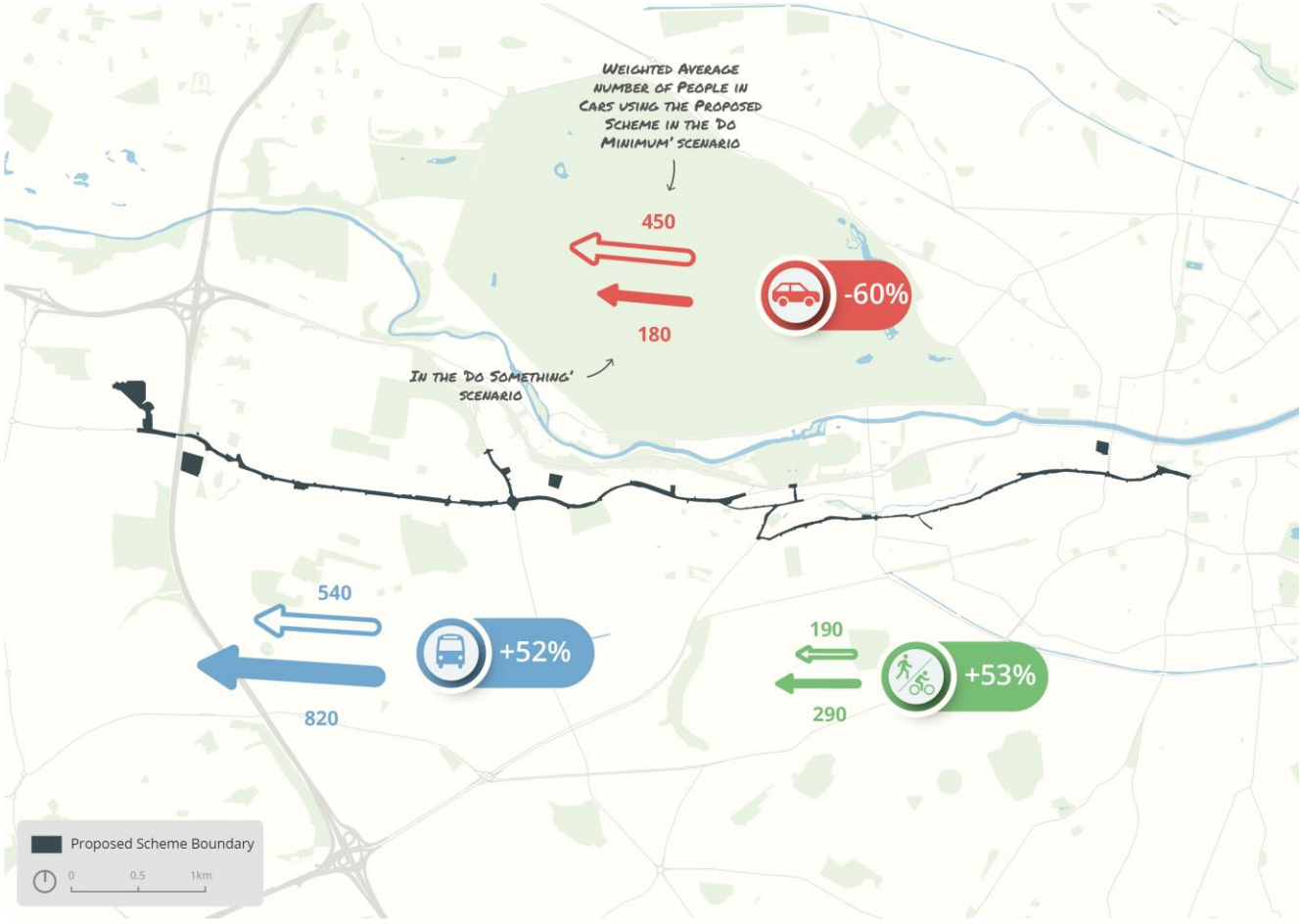


Diagram 6.8: People Movement by Mode travelling along the Proposed Scheme during 2028 PM Peak Hour

As indicated in Diagram 6.8, there is a reduction of 60% in the number of people travelling via car, an increase of 52% in the number of people travelling via bus and an increase of 53% in the number of people walking or cycling along the Proposed Scheme during the PM Peak Hour.

The contents of Table 6.37 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an outbound direction from the City Centre during the PM Peak Hour. The results indicate 9% increase in total people moved as a result of the Proposed Scheme and 52% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.37: Modal Shift of 2028 PM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Outbound from the City Centre	PM Peak Period	General Traffic	450	38%	180	14%	-270	-60%
		Public Transport	540	46%	820	64%	280	52%
		Walking	130	11%	140	11%	10	8%
		Cycling	60	5%	150	12%	90	150%
		Combined Walk/Cycle	190	16%	290	22%	100	53%
		Tot. Sustainable Modes	**730**	**62%**	**1,110**	**86%**	**380**	**52%**
		Total	**1,180**	**62%**	**1,290**	**86%**	**110**	**9%**

6.4.6.3.2.3 2043 AM Peak Hour People Movement

Diagram 6.9 illustrates the People Movement by mode travelling along the Proposed Scheme inbound towards the city centre during the AM Peak Hour in 2043.

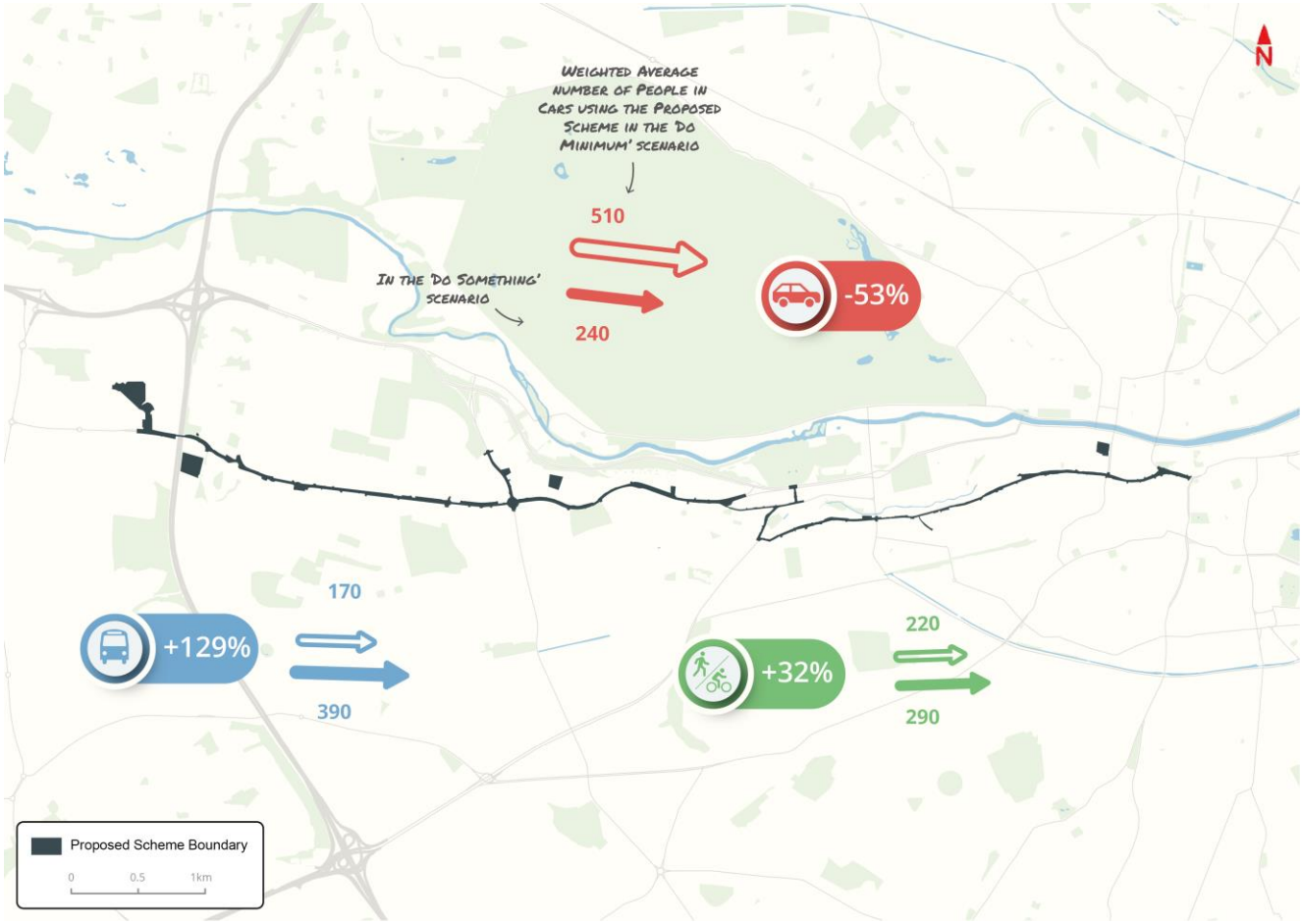


Diagram 6.9: People Movement by Mode travelling along the Proposed Scheme during 2043 AM Peak Hour

As indicated in Diagram 6.9, there is a decrease of 53% in the number of people travelling via car, an increase of 129% in the number of people travelling via bus and an increase of 32% in the number of people walking and cycling along the Proposed Scheme during the AM Peak Hour.

The contents of Table 6.38 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 2% increase in total people moved as a result of the Proposed Scheme and 74% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.38: Modal Shift of 2043 AM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Inbound towards the City Centre	AM Peak Period	General Traffic	510	57%	240	26%	-270	-53%
		Public Transport	170	19%	390	42%	220	129%
		Walking	180	20%	180	20%	0	0%
		Cycling	40	4%	110	12%	70	175%
		Combined Walk/Cycle	220	24%	290	32%	70	32%
		Tot. Sustainable Modes	**390**	**43%**	**680**	**74%**	**290**	**74%**
		Total	**900**	**100%**	**920**	**100%**	**20**	**2%**

6.4.6.3.2.4 2043 PM Peak Hour People Movement

Diagram 6.10 illustrates the People Movement by mode travelling along the Proposed Scheme outbound from the city centre during the PM Peak Hour in 2043.

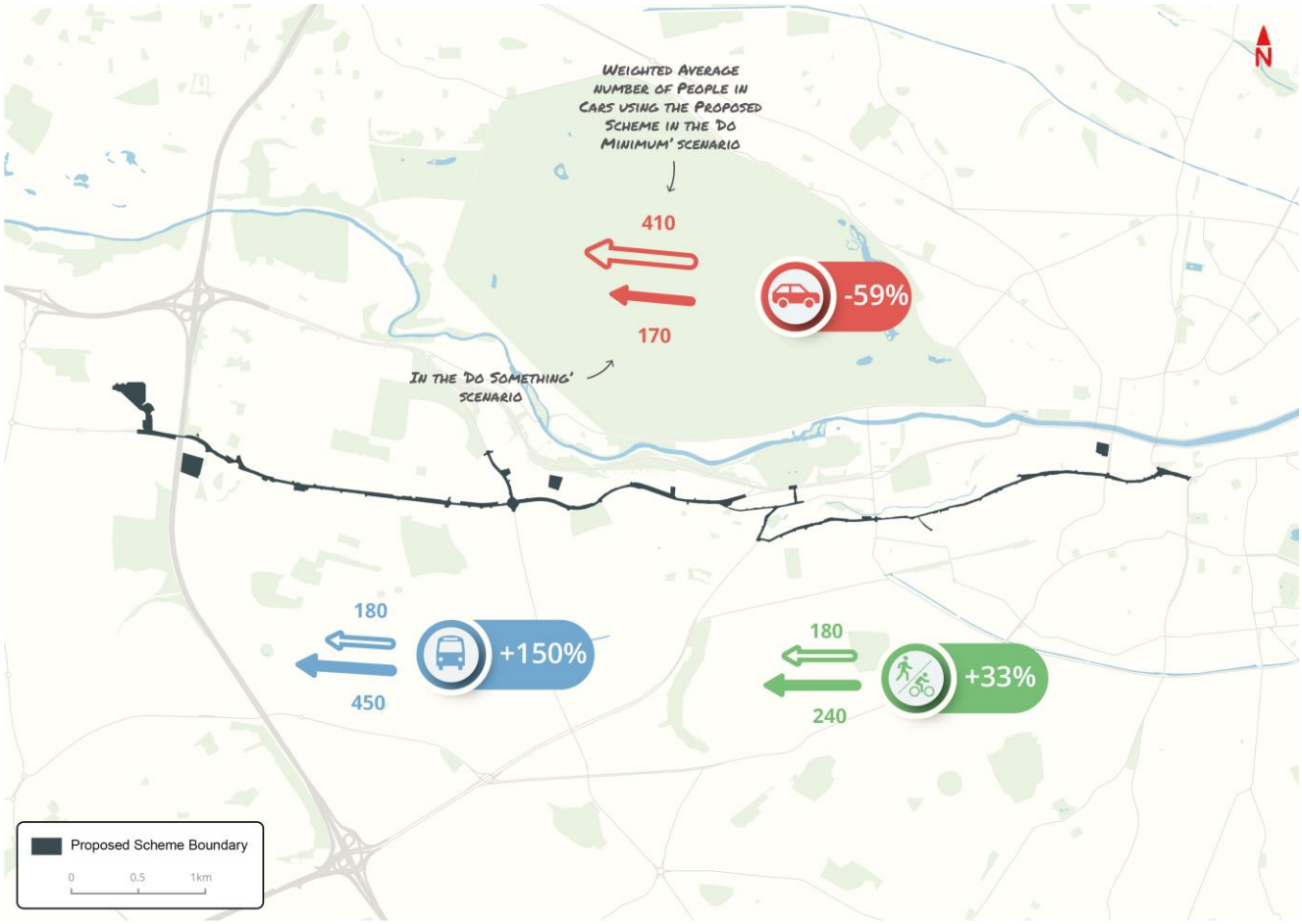


Diagram 6.10: People Movement by Mode travelling along the Proposed Scheme during 2043 PM Peak Hour

As indicated in Diagram 6.10, there is a decrease of 59% in the number of people travelling via car, an increase of 150% in the number of people travelling via bus and an increase of 33% in the number of people walking and cycling along the Proposed Scheme during the PM Peak Hour.

The contents of Table 6.39 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an outbound direction from the City Centre during the PM Peak Hour. The results indicate a 12% increase in total people moved as a result of the Proposed Scheme and 92% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.39: Modal Shift of 2043 PM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Outbound from the City Centre	PM Peak Period	General Traffic	420	54%	180	21%	-240	-57%
		Public Transport	180	23%	450	52%	270	150%
		Walking	140	18%	140	16%	0	0%
		Cycling	40	5%	100	11%	60	150%
		Combined Walk/Cycle	180	23%	240	28%	60	33%
		Tot. Sustainable Modes	**360**	**46%**	**690**	**79%**	**330**	**92%**
		Total	**780**	**46%**	**870**	**79%**	**90**	**12%**

6.4.6.3.3 People Movement by Bus

The following section presents the ERM 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 Scheme in place show a substantial increase in Bus patronage during the peak hours.

6.4.6.3.3.1 2028 AM Peak Hour Bus Passengers

Diagram 6.11 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the inbound direction in 2028.

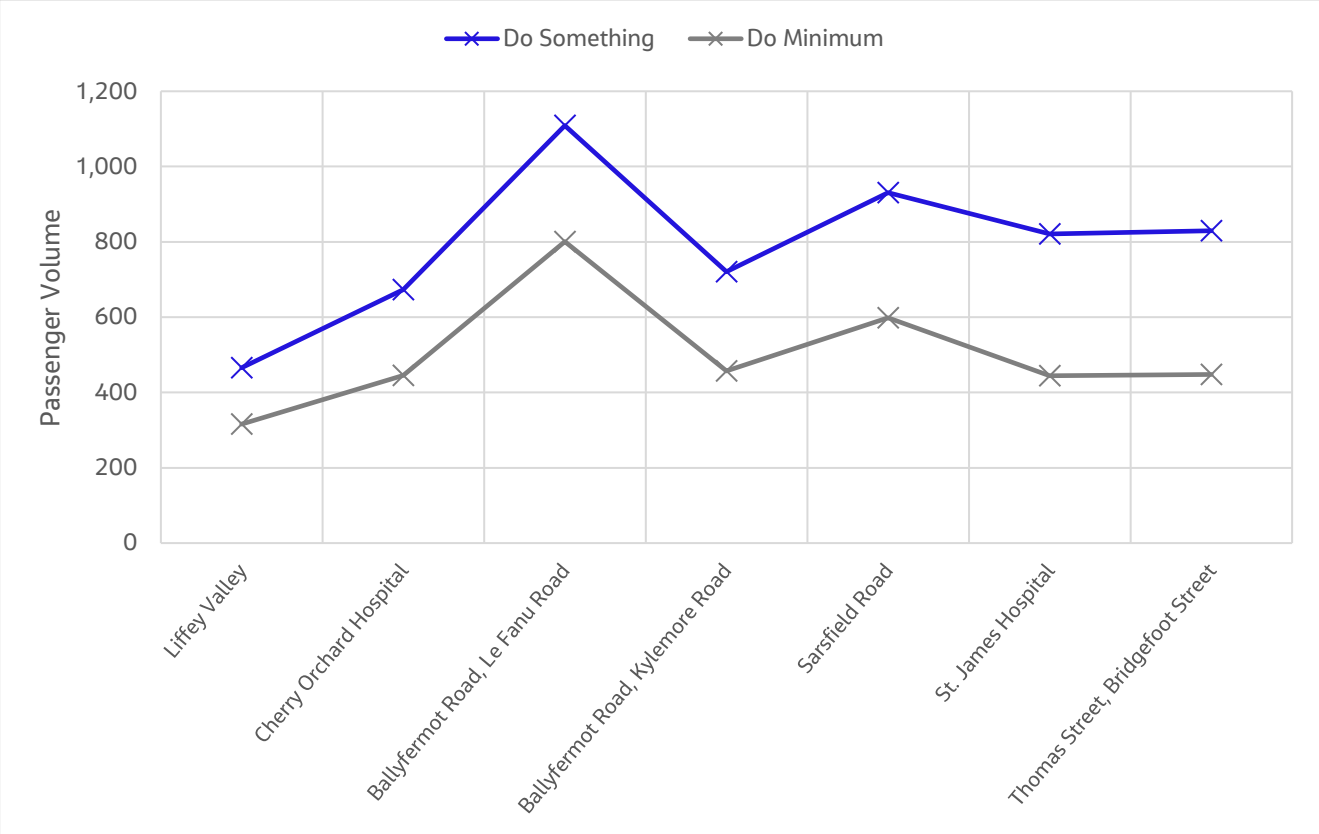


Diagram 6.11: 2028 AM Peak Hour Passenger Volume Along Proposed Scheme (inbound direction)

Diagram 6.11 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak at the intersection with Le Fanu Road where the volume of passengers reaches 1,100 passengers in the AM Peak hour, compared to approximately 800 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along the Proposed Scheme with approximately 200 to 400 additional users on the corridor, compared to the Do Minimum scenario.

6.4.6.3.3.2 2028 PM Peak Hour Bus Passengers

Diagram 6.12 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the outbound direction in 2028.

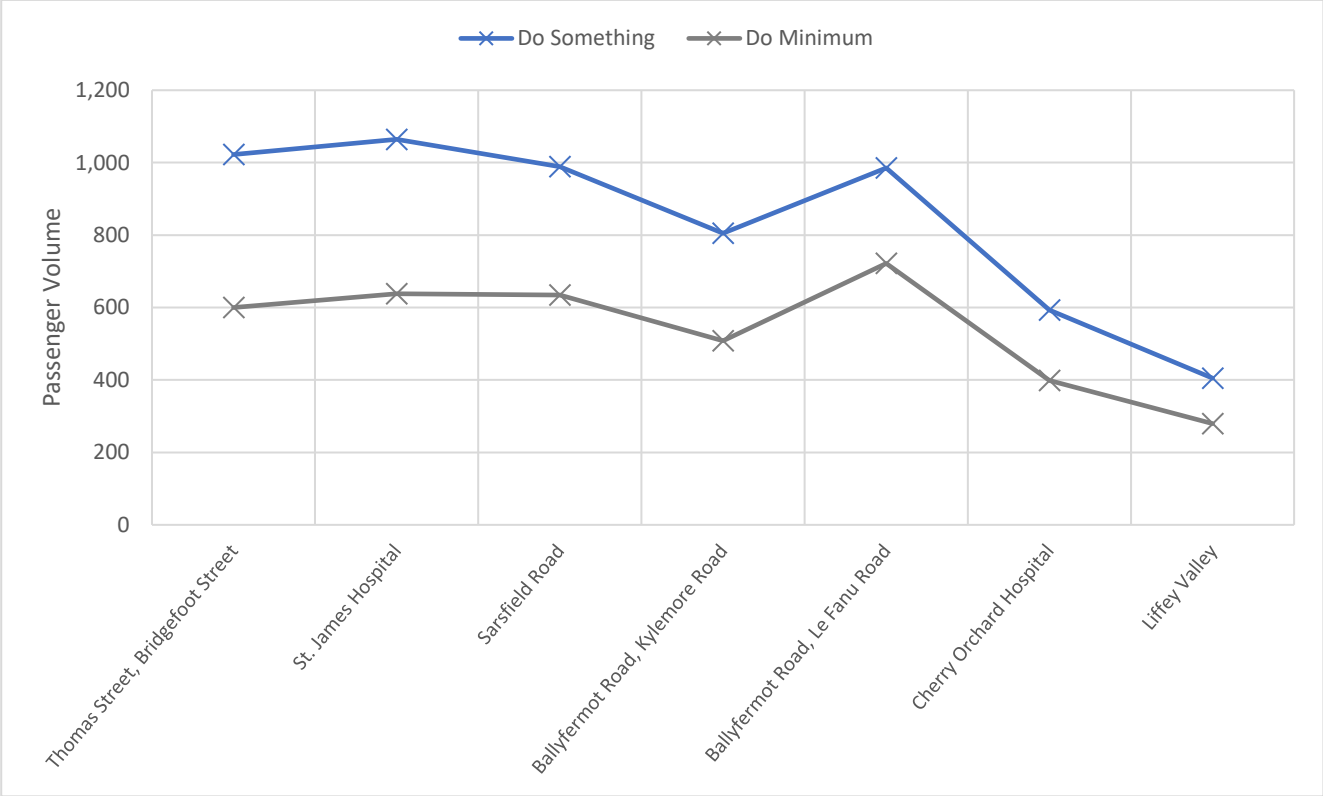


Diagram 6.12: 2028 PM Peak Hour Passenger Volume Along Proposed Scheme (outbound direction)

Diagram 6.12 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak at St. James Hospital where the volume of passengers reaches 1,050 in the PM Peak Hour, compared to approximately 650 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along the Proposed Scheme with approximately 200 to 400 additional users on most of the corridor, compared to the Do Minimum scenario.

6.4.6.3.3.3 2043 AM Peak Hour Bus Passengers

Diagram 6.13 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the inbound direction in 2043. The overall bus patronage numbers are slightly lower than in 2028 due to the Lucan Luas scheme being in place in 2043, which shares a similar catchment, however improvements are still evident between the Do Minimum and Do Something scenarios.

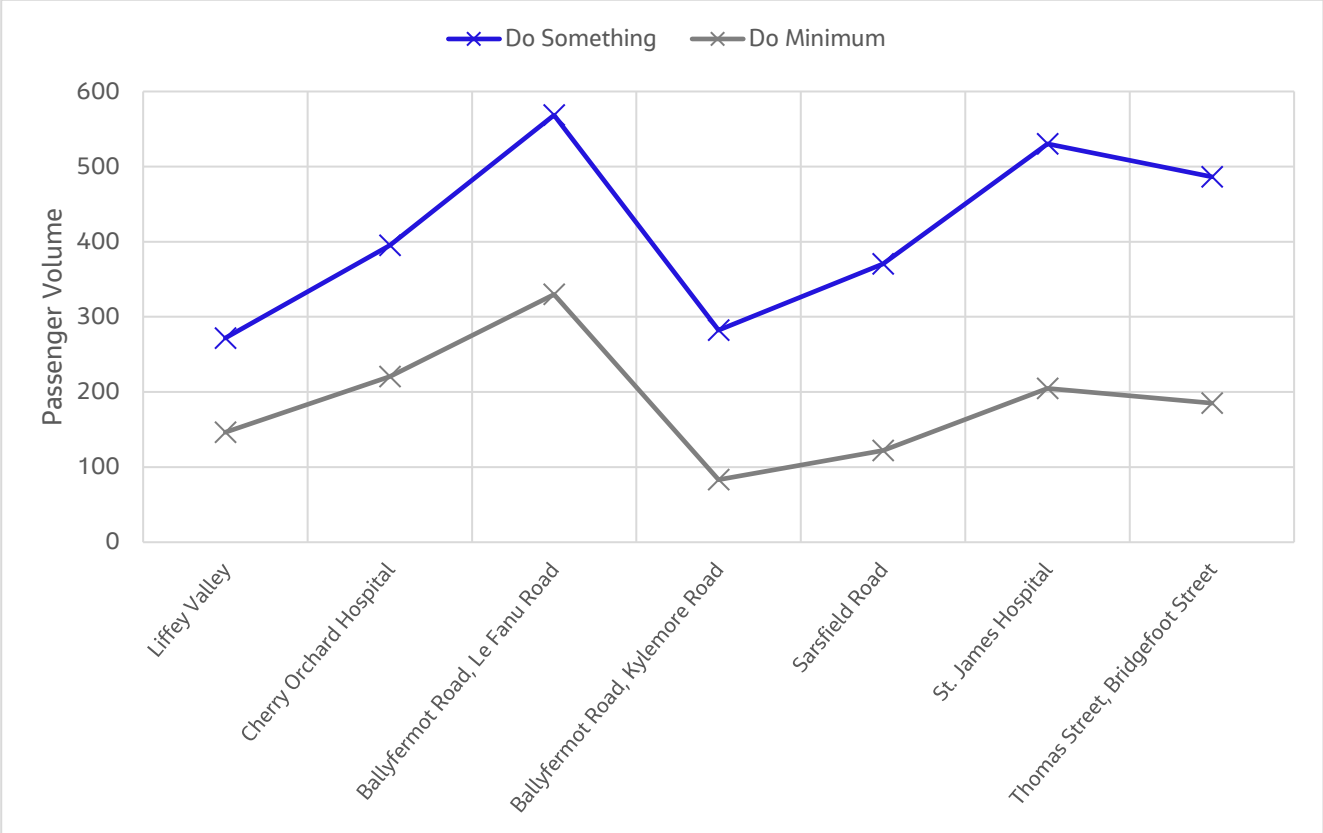


Diagram 6.13: 2043 AM Peak Hour Passenger Volume Along Proposed Scheme (outbound direction)

Diagram 6.13 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak at the intersection with Le Fanu Road where the volume of passengers reaches 550 in the AM Peak Hour, compared to approximately 350 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along the Proposed Scheme with approximately 150 to 300 additional users on the corridor, compared to the Do Minimum scenario.

6.4.6.3.3.4 2043 PM Peak Hour Bus Passengers

Diagram 6.14 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the outbound direction in 2043.

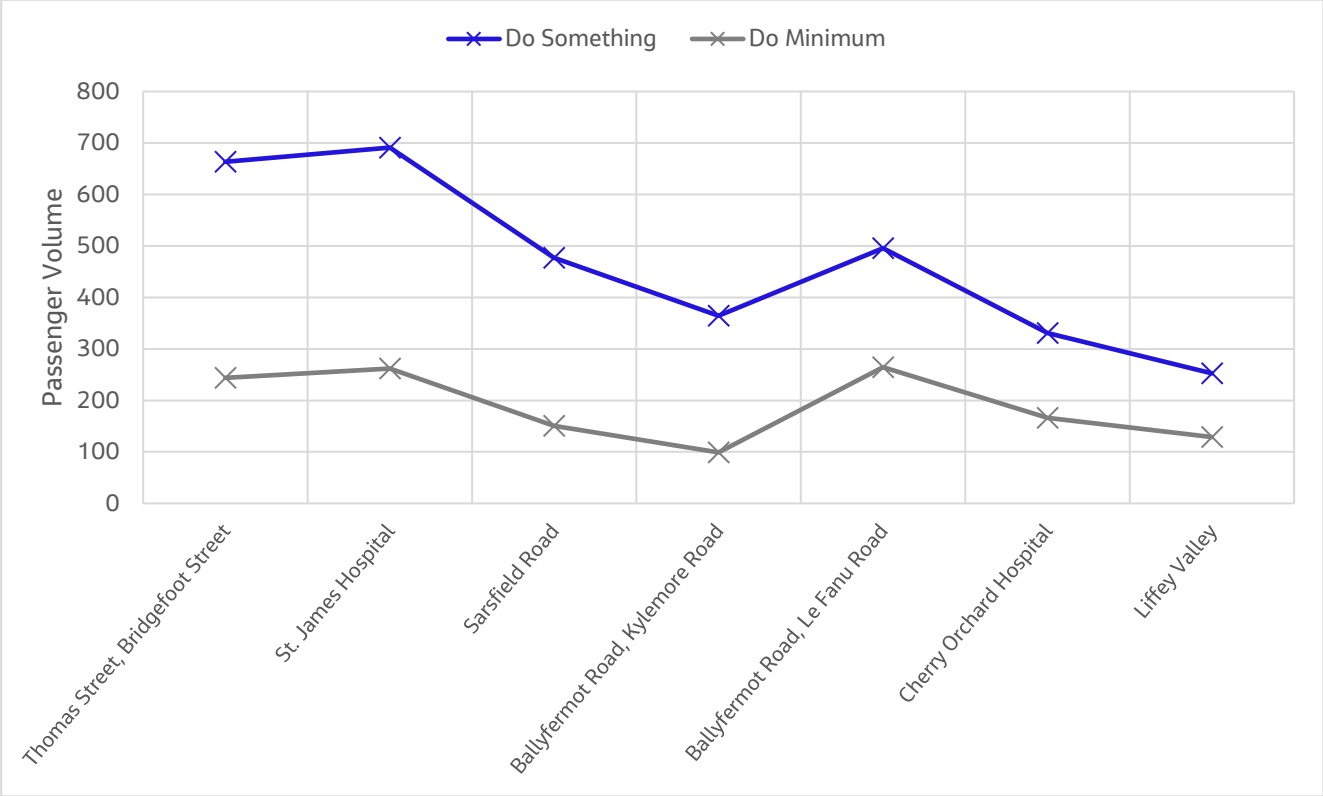


Diagram 6.14: 2043 PM Peak Hour Passenger Volume Along Proposed Scheme (Outbound Direction)

Diagram 6.14 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak at St. James Hospital where the volume of passengers reaches 700 in the PM Peak hour, compared to approximately 250 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along the Proposed Scheme with approximately 250 to 400 additional users on the corridor, compared to the Do Minimum scenario.

6.4.6.3.3.5 Bus Boardings

Since many bus services commence and end further away from the direct alignment of the Proposed Scheme, 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 Scheme (including those stops not directly on the Proposed Scheme) in both 2028 and 2043 forecast years. The results for the 2028 Opening Year scenario are indicated in Table 6.40.

Table 6.40: 2028 Peak Hour Bus Boardings on Routes using the Proposed Scheme (inc. boarding at stops outside Proposed Scheme)

Time Period	Do Minimum	Do Something	Difference in Boardings	Difference (%)
AM Peak Hour	16,140	17,010	870	5.4%
PM Peak Hour	13,220	13,890	670	5.1%

The contents of Table 6.40 show that there will be a 5.4% increase in people boarding bus routes which use any part of the Proposed Scheme during the AM Peak Hour. This represents an addition of 870 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 5.1% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 670 passengers.

Table 6.41: 2043 Peak Hour Bus Boardings on Routes using the Proposed Scheme (inc. boarding at stops outside Proposed Scheme)

Time Period	Do Minimum	Do Something	Difference in Boardings	Difference (%)
AM Peak Hour	14,180	15,170	990	7.0%
PM Peak Hour	11,530	12,410	880	7.6%

The contents of Table 6.41 show that there will be a 7% increase in people boarding bus routes which use the Proposed Scheme during the AM Peak Hour. This represents an addition of 990 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 7.6% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 880 passengers.

6.4.6.3.4 People Movement - Significance of Impact

The significance of effect for the movement of People Movement by sustainable modes with the Proposed Scheme in place has been appraised qualitatively, taking into account the changes in mode share, demand changes by mode along the Proposed Scheme as well as bus usage presented above. The impact of the Proposed Scheme has been adjudged to deliver a **Positive, Very Significant and Long-term** effect in terms of People Movement by sustainable modes. The Proposed Scheme can be shown to deliver significant improvements in people movement by sustainable modes along the Proposed Scheme corridor, particularly by bus, with reductions in car mode share due to the enhanced sustainable mode provision.

The findings of the People Movement assessment demonstrate that the Proposed Scheme aligns fully with the aims and objectives of the CBC Infrastructure Works, to 'provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor'..

6.4.6.3.5 Operational Impacts for Bus Passengers and Operators

6.4.6.3.5.1 Overview

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

Due to the stochastic nature of the micro-simulation software, model outputs based on the average of 10 simulation seed runs (Section 5.5.1 (Use of Seed Values) of the Traffic Modelling Guidelines (Transport for London, 2010) recommends a minimum of five seed values) have been calculated between the point of Proposed Scheme entry and exit and compared against the corresponding Do Minimum scenarios.

6.4.6.3.5.2 Bus Journey Time and Reliability changes as a result of the Proposed Scheme

To give an overview of how the Proposed Scheme will impact on bus journey times along the corridor, outputs for the G2 service, which traverses the entire length of the Proposed Scheme, have been extracted from the model. As outlined in Section 6.4.3, the assessment is based in the context of the full implementation of the BusConnects network re-design in both the Do Minimum and Do Something scenarios, with the Proposed Scheme benefitting the G-Spine services.

Inbound Direction

Average journey times for the inbound G2 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.42. A breakdown of the changes in average journey times for all other bus services using the Proposed Scheme can be found in Appendix A6.4.3 (Average Bus Journey Times).

Table 6.42: G2 Service Bus Average Journey Times (Inbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	36.5	27.1	-9.4	-26%
2028 PM	33.2	26.6	-6.6	-20%
2043 AM	36.1	27.0	-9.0	-25%
2043 PM	33.9	26.5	-7.4	-22%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for inbound G2 buses in the Do Minimum (red) and Do Something (blue) can be seen in Table 6.43 and Diagram 6.15 below. Each dot in the diagram represents the journey time for each individual bus in each scenario. A larger range of journey times are an indication of lower levels of reliability in each scenario.

Table 6.43: G2 Service – Range of Journey Times (Inbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	28.4	44.8	36.5	3.5	24.3	30.6	27.1	1.3
2028 PM	28.0	38.0	33.2	2.0	24.6	28.7	26.6	1.0
2043 AM	30.0	45.3	36.1	3.3	24.2	30.4	27.0	1.4
2043 PM	28.4	40.8	33.9	2.6	23.9	30.6	26.5	1.2

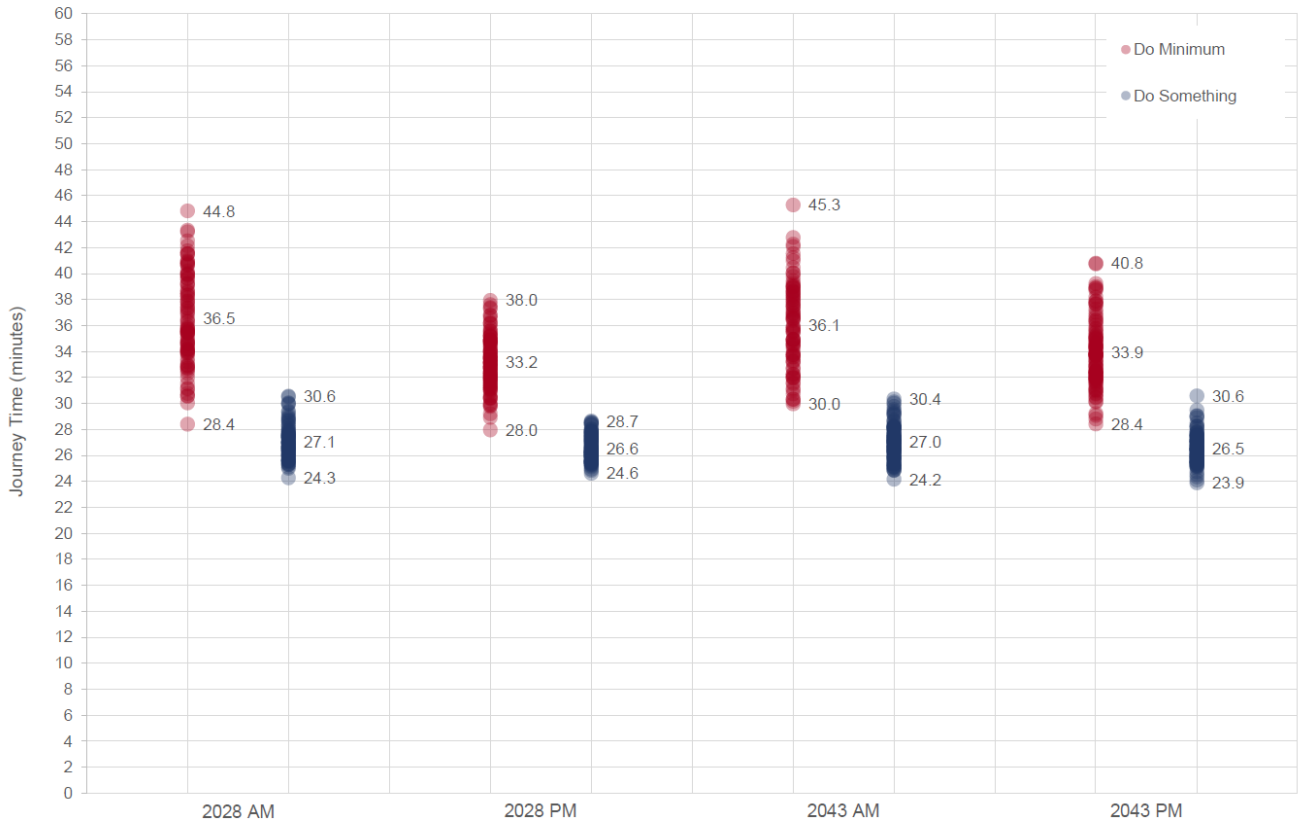


Diagram 6.15: G2 Bus Journey Times (Inbound Direction)

Based on the results presented in Table 6.42, the Proposed Scheme will deliver average inbound journey time savings for G2 service bus passengers of up to 9.4 minutes (26%) in 2028 (AM) and 9.0 minutes (25%) in 2043

(AM). Furthermore, results presented in Diagram 6.15 suggest an improvement in bus journey time reliability in all four scenarios as indicated by the reduced ranges of journey times achieved. This is shown through the individual durations focused much closer to the average journey times (lower standard deviation) in the Do Something scenario (blue dots) with the Proposed Scheme in place compared to the more dispersed range in the Do Minimum scenario (red dots).

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 Scheme.

A comparison of average Do Minimum and Do Something journey times for the inbound G2 service are also illustrated in the cumulative time-distance graphs shown in Diagram 6.16 to Diagram 6.19.

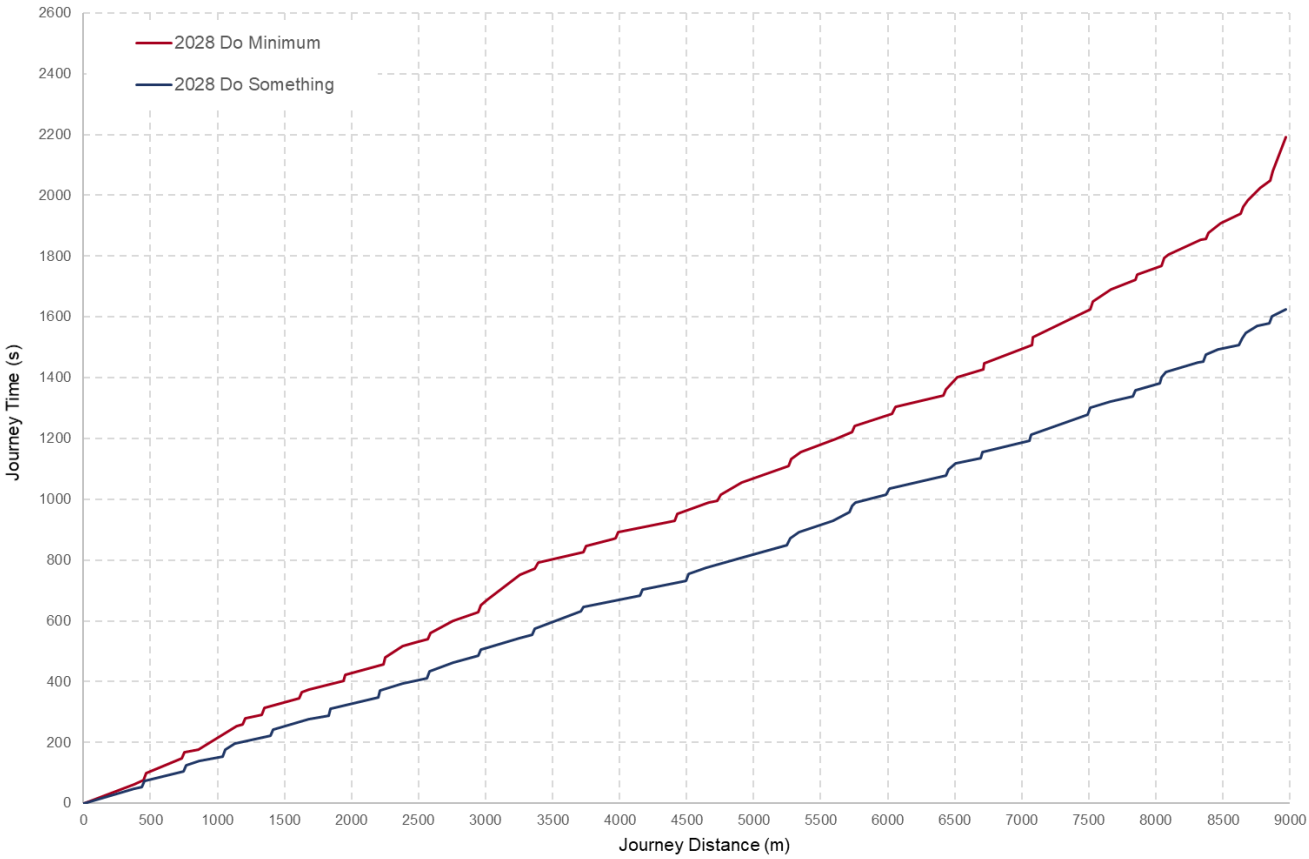


Diagram 6.16: G2 Bus Journey Time (2028 AM, Inbound)

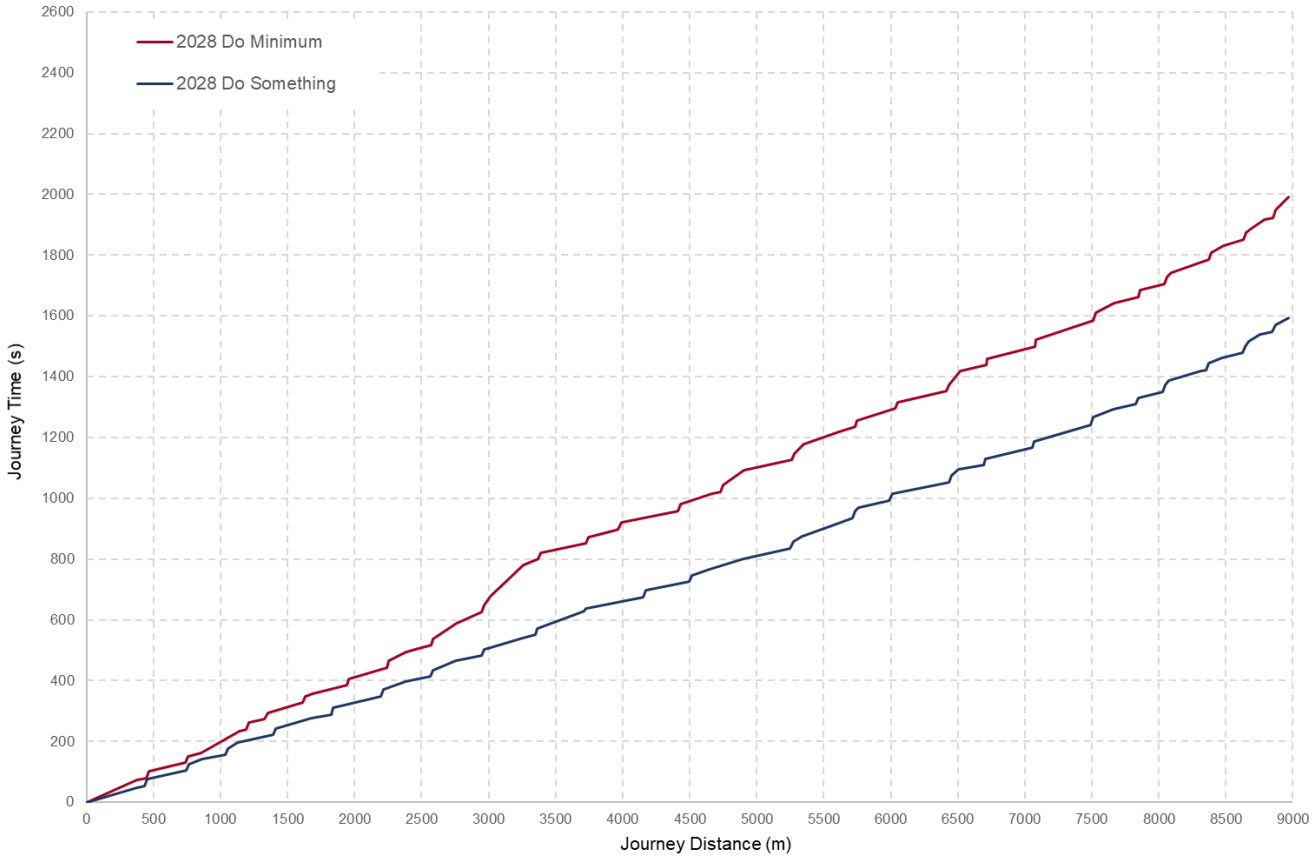


Diagram 6.17: G2 Bus Journey Time (2028 PM, Inbound)

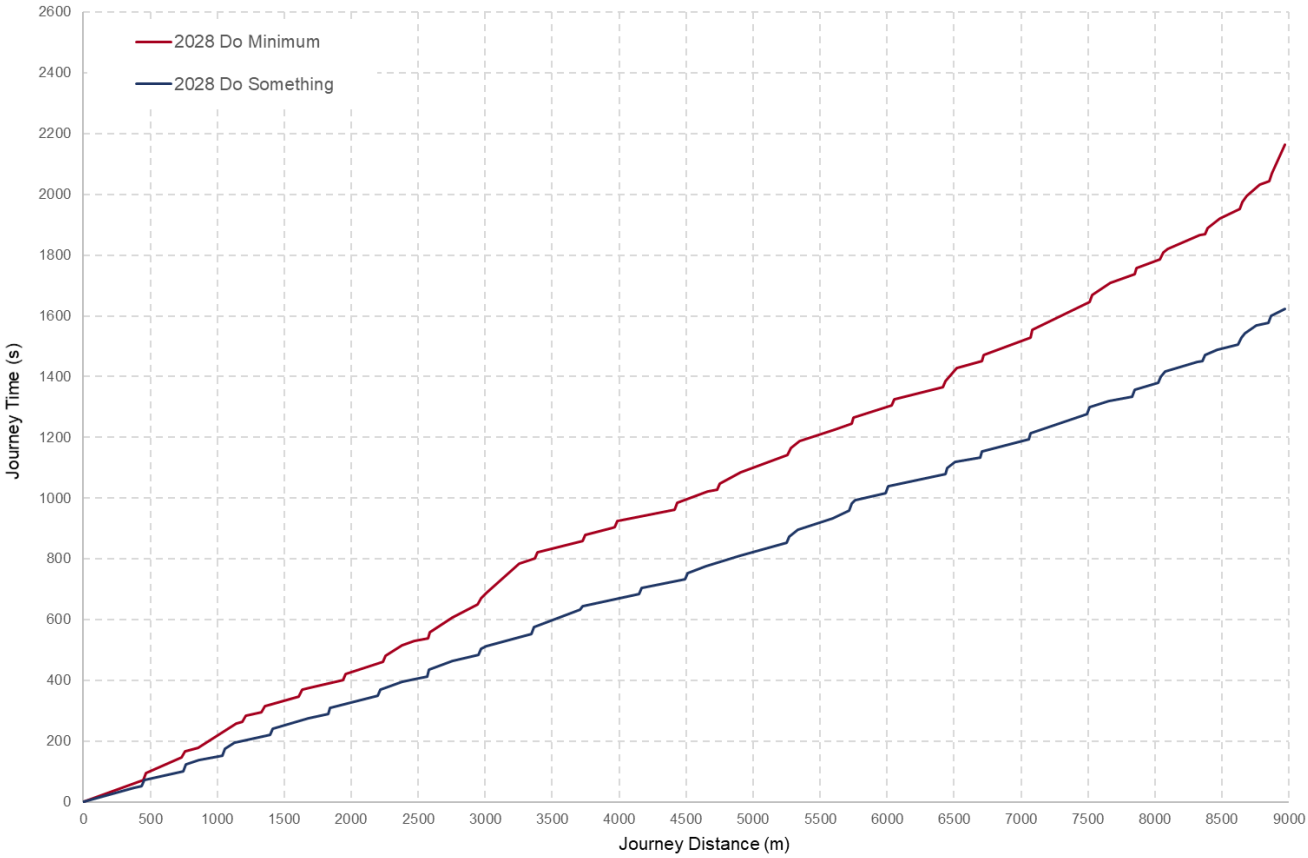


Diagram 6.18: G2 Bus Journey Time (2043 AM, Inbound)

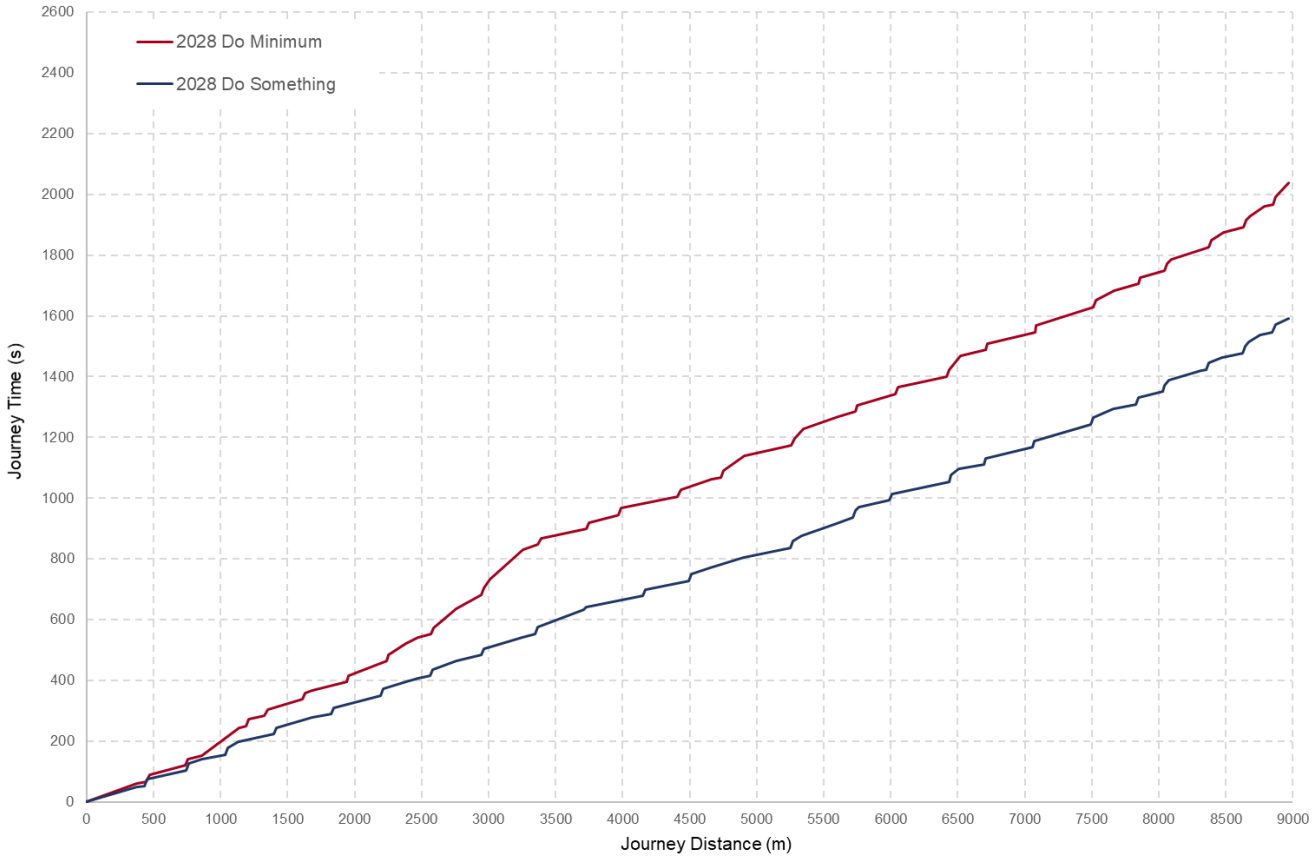


Diagram 6.19: G2 Bus Journey Time (2043 PM, Inbound)

Based on the results presented in Diagram 6.16 to Diagram 6.19, the Proposed Scheme is expected to deliver bus journey time savings on a number of critical sections. These include the length of Coldcut Road between Fonthill Road and Kennelsfort Road Upper, the section of Ballyfermot Road between Le Fanu Road and O'Hogan Road and Thomas Street / High Street between St Augustine Street and Nicolas Street. Outside of these sections, the junction improvements and bus priority 'hurry calls' modelled as part of the Proposed Scheme can be shown to create cumulative bus journey time savings over the Do Minimum.

Outbound Direction

Average journey times for the outbound G2 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.42. A breakdown of the changes in average journey times for all other bus services using the Proposed Scheme can be found in Appendix A6.4.3 (Average Bus Journey Times).

Table 6.44: G2 Service Bus Journey Times (Outbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	29.5	26.9	-2.5	-9%
2028 PM	30.0	27.0	-3.0	-10%
2043 AM	29.9	26.9	-3.0	-10%
2043 PM	29.9	27.1	-2.9	-10%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for outbound G2 buses in the Do Minimum (red) and Do Something (blue) can be seen in Table 6.45 and Diagram 6.20 below. Each dot represents the journey time for each individual bus in each scenario. A larger range of journey times are an indication of lower levels of reliability.

Table 6.45: G2 Service – Range of Journey Times (Outbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	25.2	34.3	29.5	1.7	24.5	29.3	26.9	1.0
2028 PM	25.1	35.0	30.0	1.9	24.6	29.3	27.0	1.1
2043 AM	25.8	35.4	29.9	2.1	24.1	30.5	26.9	1.2
2043 PM	26.1	36.1	29.9	2.0	23.9	30.2	27.1	1.2

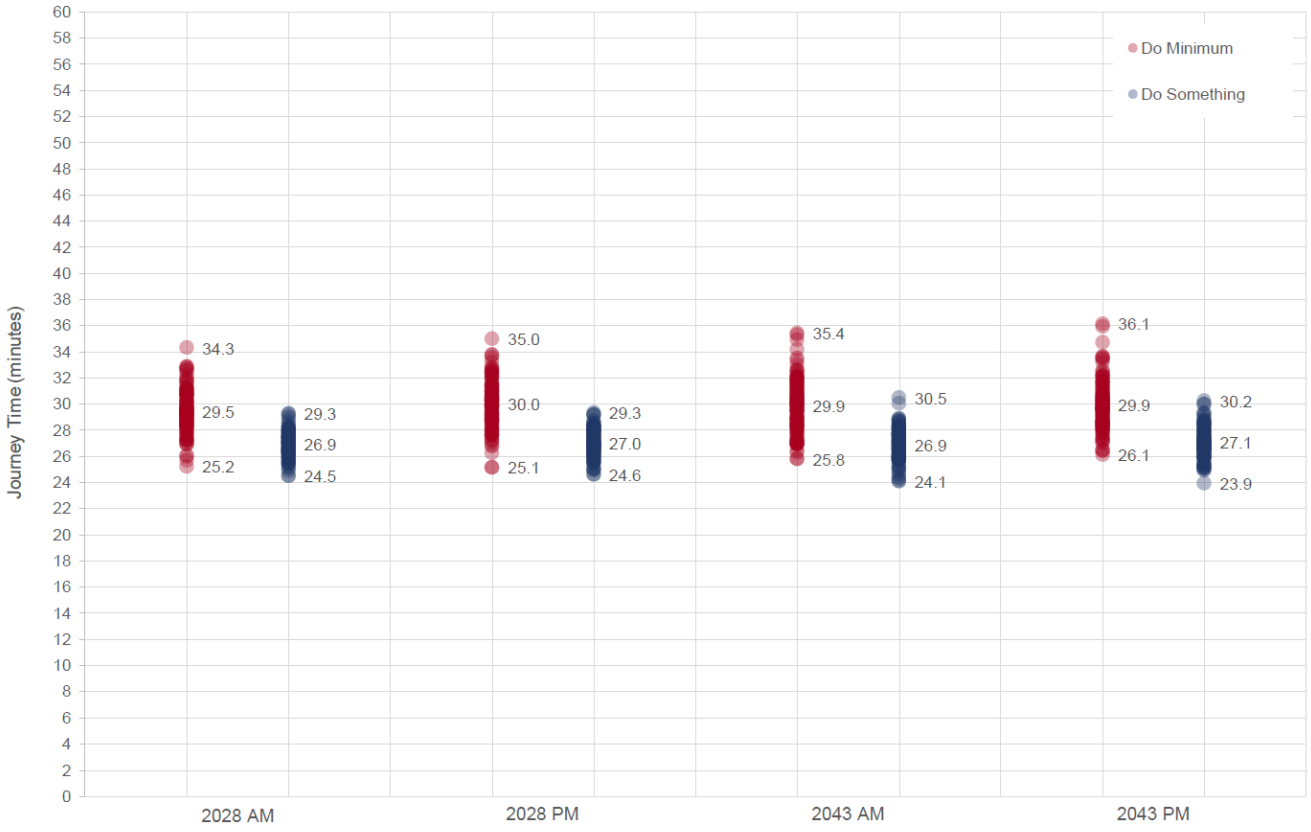


Diagram 6.20: G2 Bus Journey Times (Outbound Direction)

Based on the results presented in Table 6.425, the Proposed Scheme will deliver average outbound journey time savings for G2 service bus passengers of up to 3.0 minutes (10%) in 2028 (PM) and 3.0 minutes (10%) in 2043 (AM). Furthermore, results presented in Diagram 6.25 suggest an improvement in bus journey time reliability in all four scenarios as indicated by the reduced ranges of journey times achieved with the durations focused much closer to the average journey times (lower standard deviation) in the Do Something scenario (blue dots) with the Proposed Scheme in place compared to the more dispersed range in the Do Minimum scenario (red dots).

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 Scheme.

A comparison of average Do Minimum and Do Something journey times for the D2 service for the outbound direction of travel illustrated in the cumulative time-distance graphs shown in Diagram 6.21 to Diagram 6.24.

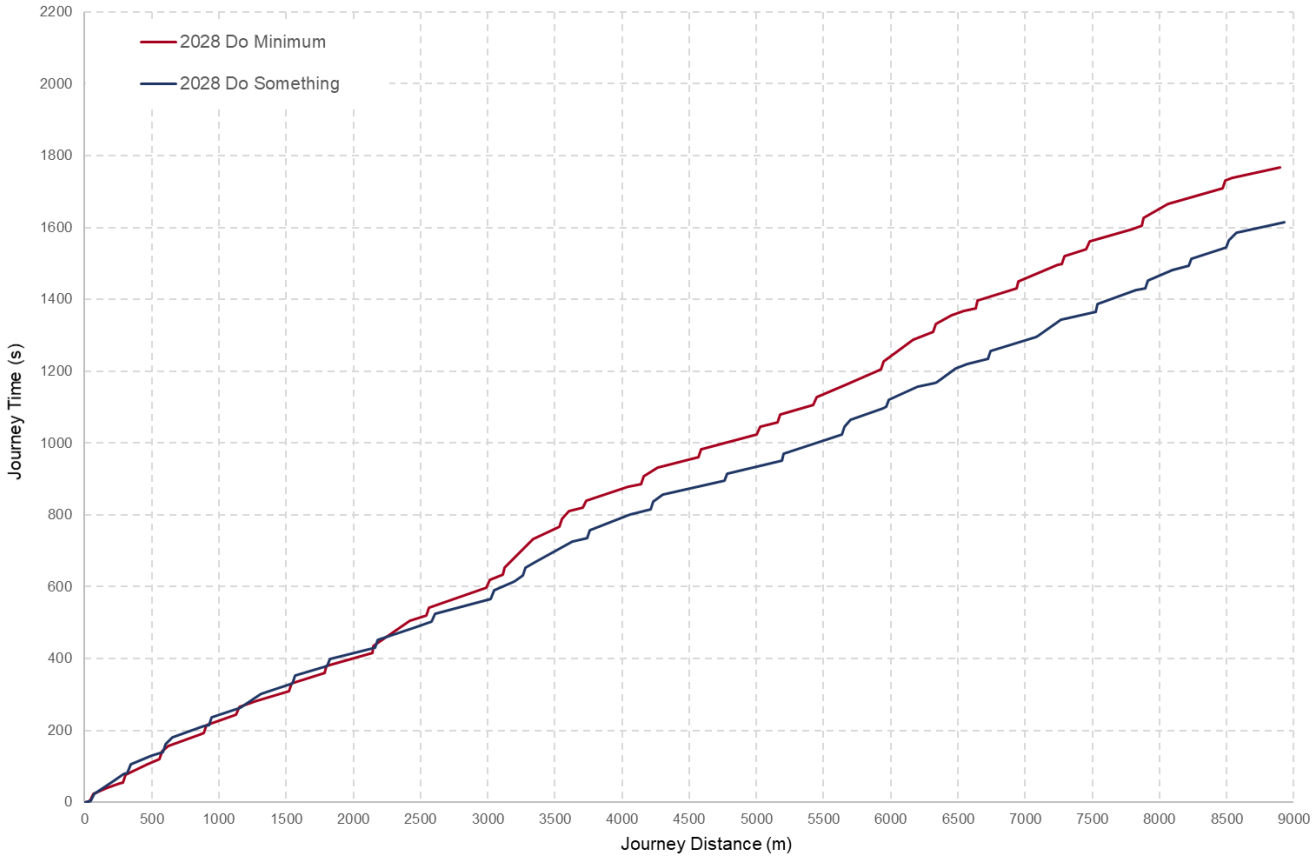


Diagram 6.21: G2 Bus Journey Time (2028 AM, Outbound)

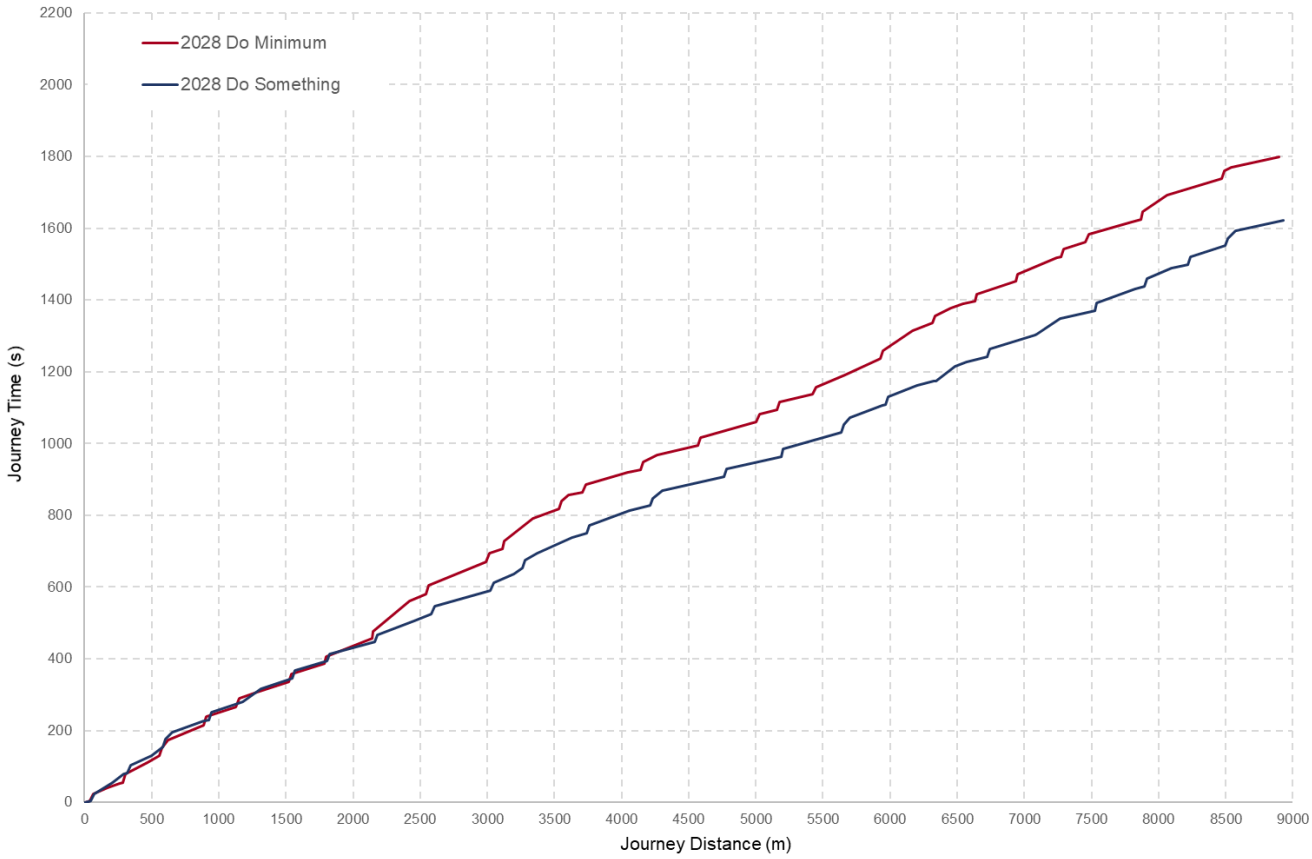


Diagram 6.22: G2 Bus Journey Time (2028 PM, Outbound)

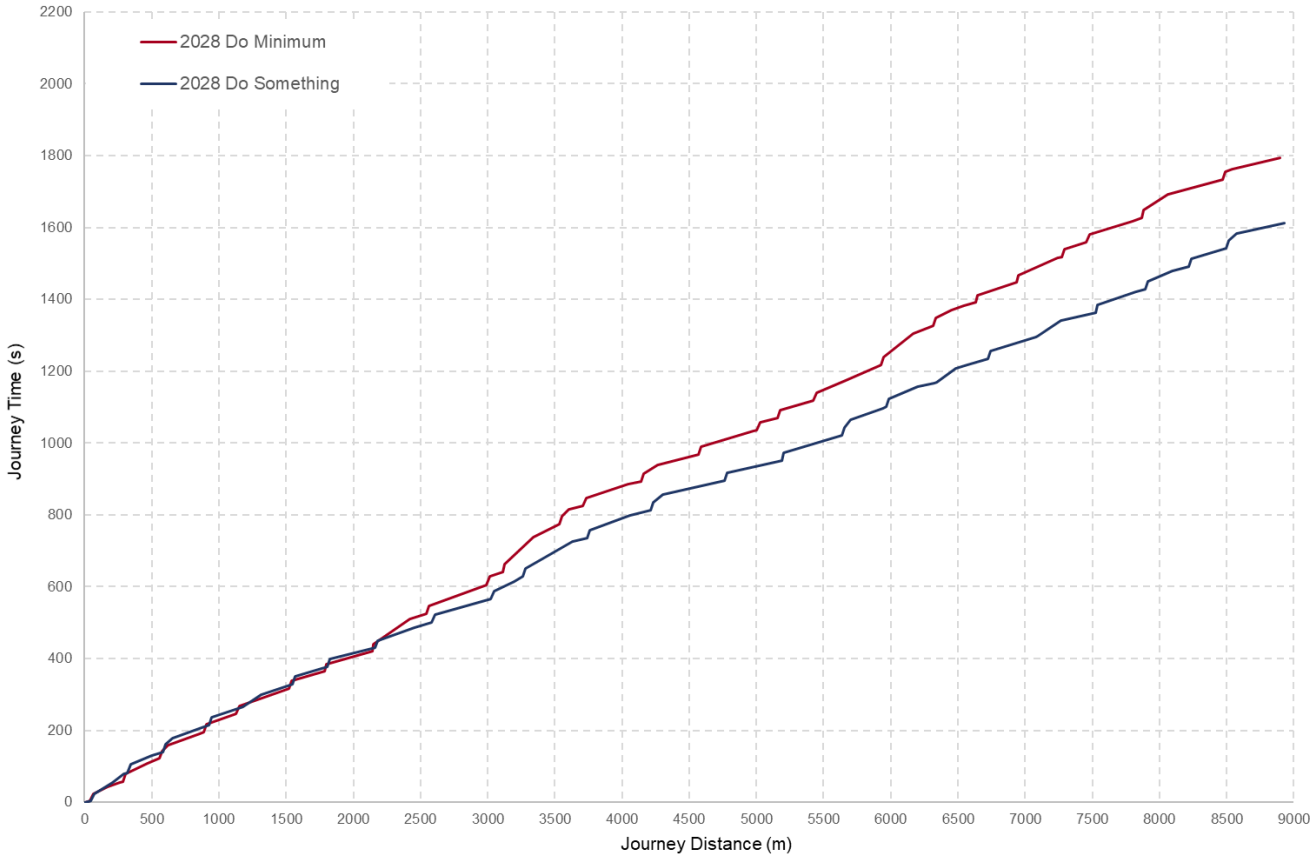


Diagram 6.23: G2 Bus Journey Time (2043 AM, Outbound)

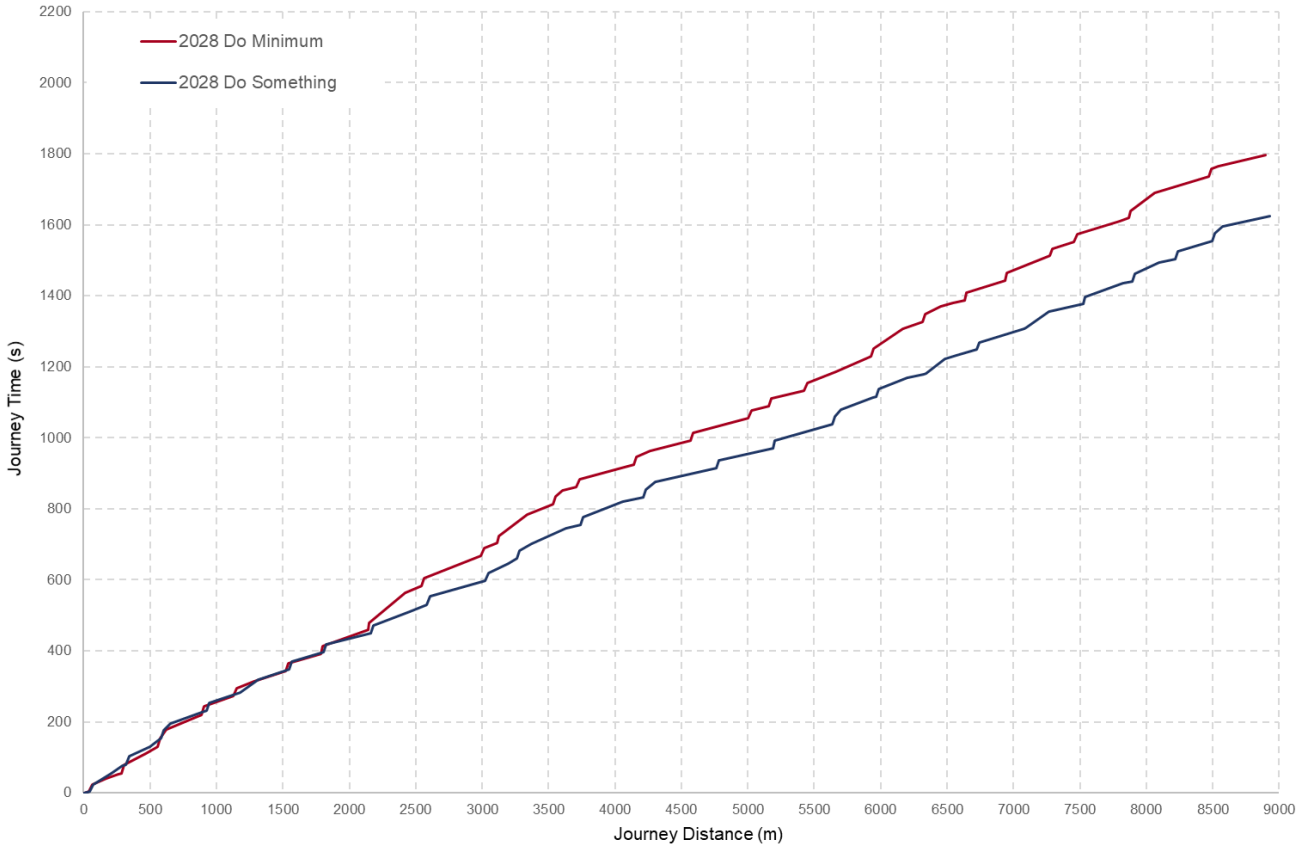


Diagram 6.24: G2 Bus Journey Time (2043 PM, Outbound)

Based on the results presented in Diagram 6.16 to Diagram 6.19, the Proposed Scheme is expected to deliver moderate bus journey time savings in the outbound direction along the Proposed Scheme. The greatest improvements can be seen between St James's Hospital and Tyconnell Road/Grattan Crescent and on the section of Ballyfermot Road between O'Hogan Road and Le Fanu Road. Outside of these sections, the bus priority 'hurry calls' modelled as part of the Proposed Scheme can be shown to create cumulative bus journey time savings over the Do Minimum.

6.4.6.3.5.3 Total Journey Time Changes for all Proposed Scheme Bus Services

The change in total bus journey time for all buses travelling along the Proposed Scheme, is shown in Table 6.46 in vehicle minutes.

Table 6.46: Total Bus Journey Time

Peak Hour	Do Minimum (vehicle.minutes)	Do Something (vehicle.minutes)	Difference (vehicle.minutes)	%Difference
2028 AM	1044.3	833.3	-211.0	-20%
2028 PM	959.7	834.7	-125.1	-13%
2043 AM	1039.7	831.3	-208.4	-20%
2043 PM	978.2	837.3	-140.9	-14%

Based on the results presented in Table 6.46, modelling shows that the Proposed Scheme will reduce total bus journey times along the Proposed Scheme by up to 20% in 2028 and 2043. Based on the AM and PM peak hours alone, this equates to **5.6 hours of savings in 2028 and 5.8 hours in 2043** combined across all buses when compared to the Do Minimum. On an annual basis this equates to approximately 4,200 hours of bus vehicle savings in 2028 and 4,400 hours in 2043, when considering weekday peak periods only.

6.4.6.3.6 Bus Users Assessment Summary

The findings of the Bus User assessment shows that the Proposed Scheme fully aligns with the aims and objectives of the CBC Infrastructure Works, to 'Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements.

The significance of impact on bus users of the Proposed Scheme has been appraised using a qualitative assessment, taking the changes in journey time and journey reliability metrics presented above into consideration. The Proposed Scheme is considered to deliver a **Positive, Significant and Long-term** impact overall.

6.4.6.3.7 Increased Bus Frequency - Resilience Sensitivity Analysis

6.4.6.3.7.1 Background

For the purposes of this EIAR and the transport modelling undertaken in support of the EIAR, no increase in bus service frequency beyond that planned under the current Bus Connects Network redesign proposals was assessed. The bus frequencies used in the modelling are based on the proposed service rollout as part of the BusConnects Network Redesign and are the same in both the Do Minimum and Do Something scenarios. This rollout is currently underway. The rationale for undertaking this approach was that the planning consent being sought and which this EIAR supports is solely for the infrastructural improvements associated with providing bus priority along the Proposed Scheme.

This analysis, however, is conservative as the bus priority infrastructure improvements and indeed the level of protection it will provide to bus journey time consistency and reliability will provide a significant level of resilience for bus services that will use the Proposed Scheme from implementation into the future. The resilience provided by the Proposed Scheme will allow the service pattern and frequency of bus services to be increased into the future to accommodate additional demand without having a significant negative impact on bus journey time reliability or the operation of cycle and pedestrian facilities. In order to assess this resilience and the potential impacts of this resilience on carbon emissions, an additional analysis has been undertaken, which is detailed below.

6.4.6.3.7.2 Resilience Testing

A key benefit of the provision of a resilient BusConnects Service network, one which can provide reliable and consistent journey times, is that it has potential to cater for further significant transfer from private car travel to more sustainable and environmentally friendly travel via public transport.

To assess the resilience of the Proposed Scheme to cater for additional bus service frequency provision whilst maintaining a high level of bus journey time reliability, a separate analysis was undertaken in the Proposed Scheme micro-simulation model. In this analysis, the service frequency, in both directions of travel, was increased to achieve a 10 buses per hour increase, at the busiest section, to assess whether the Proposed Scheme could cater for this increased service frequency whilst maintaining a high level of journey time reliability. The analysis was undertaken in the 2028 Minimum and Do Something models to assess whether the bus priority infrastructure was having the desired impact of protecting bus journey time reliability.

The bus service frequency, along the busiest section at St. James's Hospital (where the G Spine meets the O, S2, N2 services), in the 2028 Do Minimum model and in the 2028 Do Something Resilience testing models is outlined in Table 6.47.

Table 6.47: Resilience Testing Bus Service Frequency Scenario Testing

Scenario	Inbound (Buses per Hour)	Outbound (Buses per Hour)
Do Minimum	28	28
Do Something	28	28
Do Minimum - Additional Services Resilience Test	38	38
Do Something - Additional Services Resilience Test	38	38

Table 6.48 outlines the average AM journey times for the inbound G2 service, and the average PM journey times for the outbound G2 service in the 2028 Opening Year.

Table 6.48: G2 Service – Average Bus Journey Times

Direction	Do Minimum (minutes)	Do Minimum (Additional Services) (minutes)	% Difference	Do Something (minutes)	Do Something - Additional Services (minutes)	% Difference
2028 Inbound AM	36.5	37.7	+3.2%	27.1	27.3	+0.8%
2028 Outbound PM	30.0	30.9	+3.0%	27.0	27.3	+1.1%

The results of the scenario testing with an additional 10 buses per direction per hour operating along the Proposed Scheme in the 2028 Opening Year are presented graphically in Diagram 6.25. The diagram displays the maximum, minimum and average journey times for each of the G2 bus services modelled.

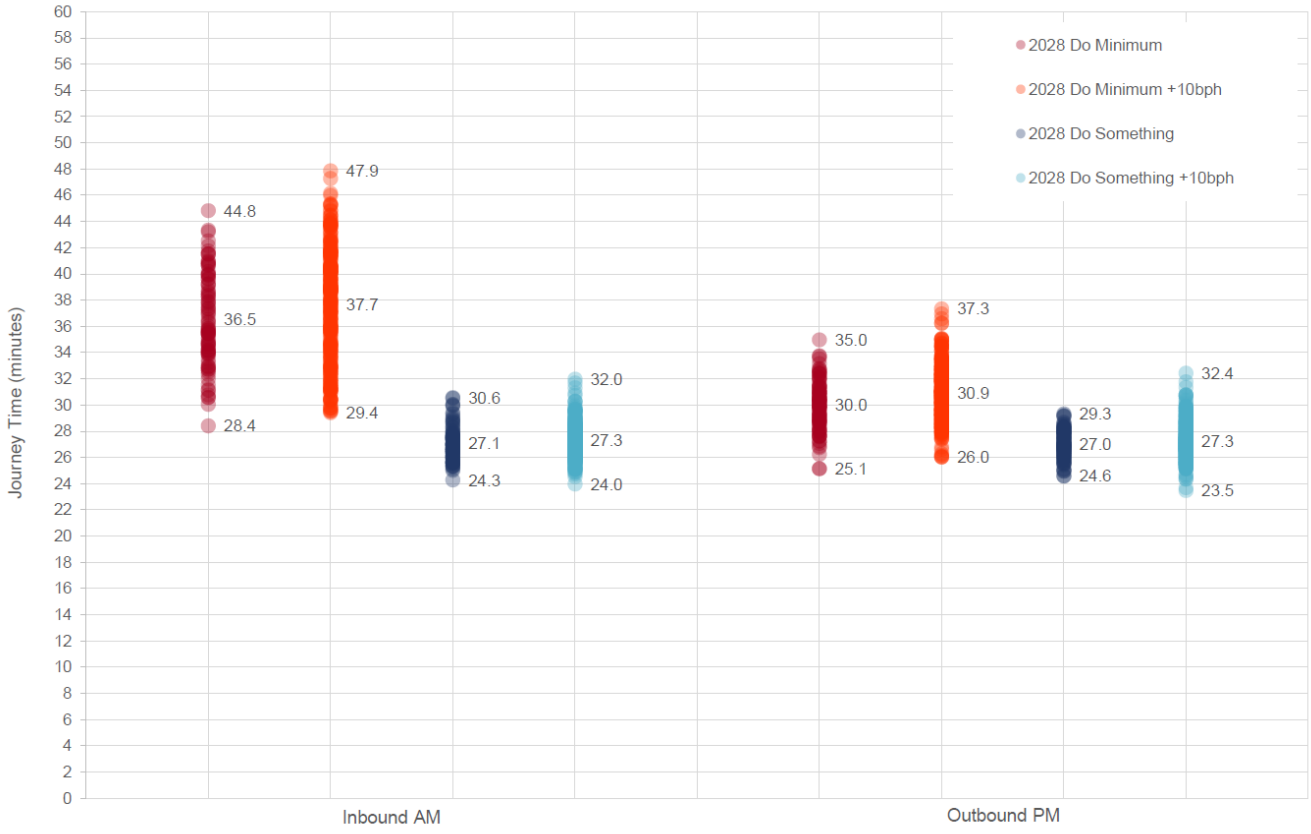


Diagram 6.25: Resilience Testing Bus Journey Time Reliability Indicators - Scenario Testing– Opening Year (2028)

As can be seen from Table 6.40 and Diagram 6.25 the results indicate that even with an additional 10 services operating per direction per hour along the Proposed Scheme, a high level of journey time reliability is maintained in the Do Something scenarios, comparable with the 28 buses per direction per hour results. The results indicate negligible change in journey times in the Do Something Resilience sensitivity test per bus. Do Minimum Resilience sensitivity test, however, bus journey time reliability is more severely impacted with additional services in place. The sensitivity test undertaken indicates that with the additional bus services in place in the Do Minimum scenario a larger change in bus journey times of up to c1.2 minutes on average per bus is experienced. ***This highlights the benefit that the Proposed Scheme infrastructure improvements can provide in protecting bus journey time reliability and consistency, as passenger demand continues to grow into the future.***

It must be noted that it was assumed the general traffic levels included in each scenario would remain static. If traffic levels were to increase (typical daily variations are in the order of +/- 15%) then the bus priority infrastructure would further protect journey time reliability and resilience in comparison with the Do Minimum scenario.

Further details on the potential additional greenhouse gas (GHG) emissions savings that could occur from this resilience is outlined in Chapter 8 (Climate).

6.4.6.3.8 General Traffic Assessment

6.4.6.3.8.1 Overview

The Proposed Scheme 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 Scheme 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 are based on the assumption 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 economic activity with patterns of travel remaining the same. For example, the assessment assumes a 45% and 77% increase in goods traffic versus the base year in 2028 and 2043 respectively. This is considered a very conservative assumption. It should be noted, however, that the 2021 Climate Action Plan (CAP) (DCCAE 2021) includes reference to a freight strategy for the region 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. The CAP outlines plans to manage the increase in delivery and servicing requirements as the population grows, which 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 Scheme 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.

6.4.6.3.8.2 Significance of the General Traffic Impact

To determine the impact that the Proposed Scheme 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 Scheme. 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 in Table 6.49.

Table 6.49: Significance of the Reduction in General Traffic Flows

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

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

Localised junction models have been developed using industry standard modelling packages such as LinSig (a software tool by JCT Consultancy which allows traffic engineers to model traffic signals) and Junctions 9 (a software tool by TRL for the modelling and analysis of roundabout and priority intersections) to determine the appropriate staging, phasing, green times and operational capacity at all junctions along the direct study area. These junction models have been developed using consistent traffic flows as predicted and modelled in the ERM, LAM and micro-simulation models using the iterative traffic modelling process described in Section 6.2 of this EIAR. The full outputs of the results are available in the Appendix A6.3 (Junction Design Report) in Volume 4 of this EIAR.

Significance of an Increase in General Traffic: To determine the impact that the Proposed Scheme 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 (May 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.

Diagram 6.26 presents an extract 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.

Diagram 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 Scheme. This has been achieved by extending the threshold to cover all road types in the vicinity of the Proposed Scheme, 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 Scheme 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 junctions with or on 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 Scheme 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.

6.4.6.3.8.3 General Traffic Flow Difference – AM Peak Hour

Diagram 6.27 (extract from Figure 6.7 in Volume 3 of this EIAR) illustrates the difference in traffic flows on the road links in the AM Peak Hour for the 2028 Opening Year. Please see Appendix A6.4.4 (General Traffic Assessment) in Volume 4 of this EIAR for the full LAM outputs.

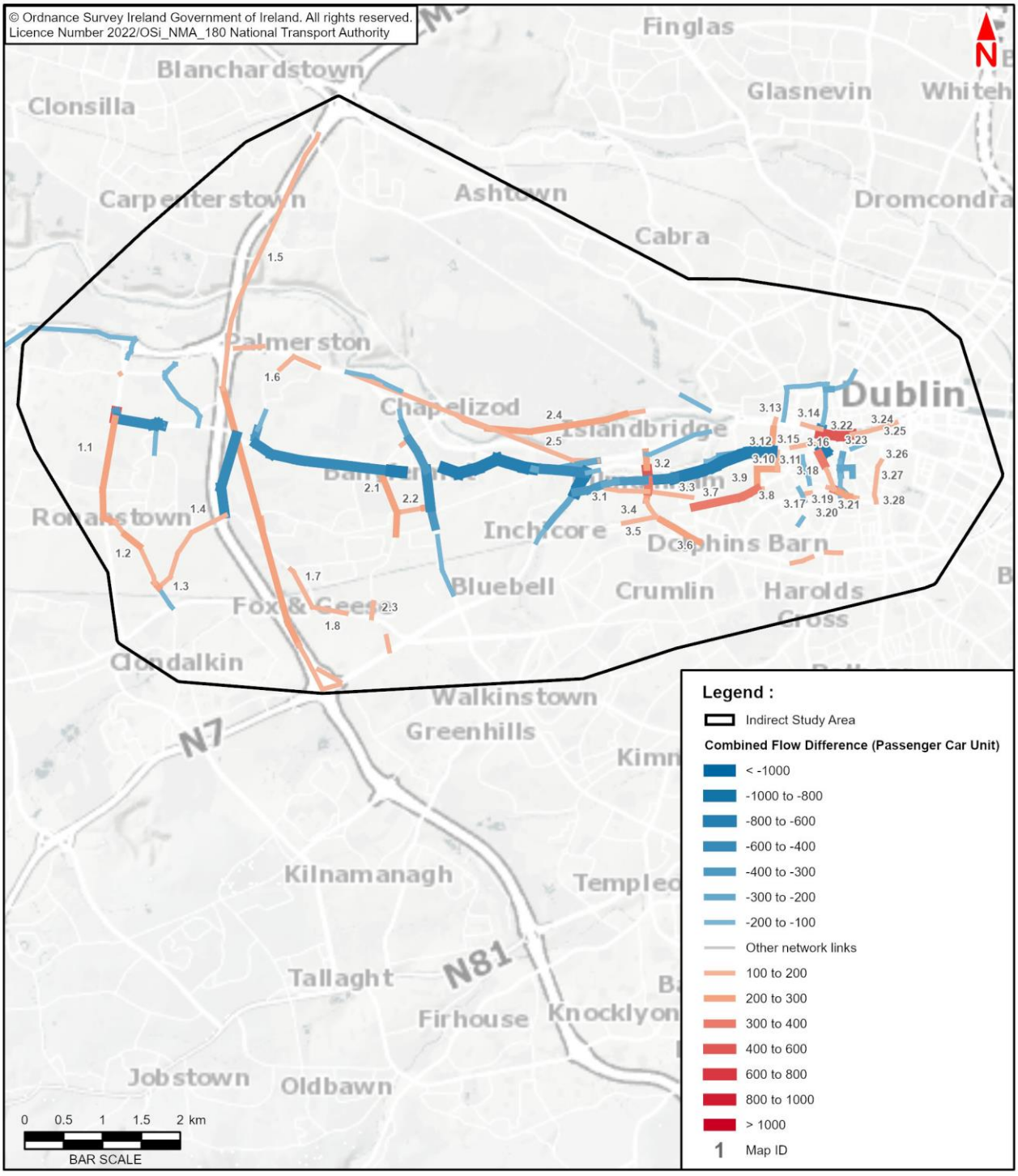


Diagram 6.27: Flow Difference on Road links (Do Minimum vs Do Something), AM Peak Hour, 2028 Opening Year

Impact on Direct Study Area (AM Peak Hour)

Direct Reductions in General Traffic: The LAM indicates that, during the 2028 Opening Year scenario, there are reductions in general traffic noted along the Proposed Scheme during the AM Peak Hour, as illustrated by the blue lines in Diagram 6.27, which indicates where a reduction of at least -100 combined traffic flows occur.

The key reductions in traffic flows during the AM Peak Hour are outlined in Table 6.50.

Table 6.50: Road Links that Experience a Reduction of ≥ 100 Combined Flows during AM Peak Hour (Direct Study Area)

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Section 1 - Liffey Valley to Le Fanu Road	S.1	Fonthill Road	544	399	-145
		R833 Coldcut Road	2000	1063	-937
		R833 Ballyfermot Road	1022	446	-576
Section 2 - Le Fanu Road to Sarsfield Road	S.2	R833 Ballyfermot Road	1080	206	-874
		R112 Kylemore Road	892	511	-382
		R833 Sarsfield Road	1238	573	-666
		Sarsfield Road	690	180	-510
Section 3 - Sarsfield Road to City Centre	S.3	R839 Inchicore Road	797	619	-178
		R839 Grattan Crescent	1287	576	-712
		R810 Emmet Road	1307	917	-390
		R810 Old Kilmainham	869	264	-606
		R810 Mount Brown	861	256	-606
		R810 James Street	1370	665	-706
		R810 Thomas Street	1474	653	-822
		R810 Cornmarket	1217	117	-1100
		R108 High Street	2148	815	-1333

The contents of Table 6.50 demonstrate that the general traffic flow reductions along the direct study area vary between -145 and -1,333 during the AM Peak Hour of the 2028 Opening Year.

Along Section 1 of the Proposed Scheme there is a slight to very significant reduction of between -145 (Fonthill Road) and -937 (R833 Coldcut Road) in general traffic flows along the direct study area. However, along Section 2 of the Proposed Scheme there is a moderate to very significant reduction of between -382 (R112 Kylemore Road) and -874 (Ballyfermot Road) in general traffic flows along the direct study area. Whilst, along Section 3 of the Proposed Scheme there is a slight to profound reduction of between -178 (R839 Inchicore Road) and -1,333 (R108 High Street) in general traffic flows along the direct study area.

Overall, the reductions in general traffic flows along the direct study area during the AM Peak Hour of the 2028 Opening Year have been determined to have a **Positive, Significant and Long-term effect**.

There are no increases in traffic flows along the direct study area during the AM Peak Hour of the 2028 Opening Year.

Impact on Indirect Study Area (AM Peak Hour)

Indirect Reductions in General Traffic: In addition to the traffic flow reductions occurring along the direct study area, there are key reductions in general traffic flows noted along certain road links within the indirect study area during the AM Peak Hour. The key reductions in traffic flows along the indirect study area during the AM Peak Hour of the 2028 Opening Year are outlined in Table 6.51.

Table 6.51: Road Links that Experience a Reduction of ≥ 100 Combined Flows during AM Peak Hour (Indirect Study Area)

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Adjacent to Section 1 - Liffey Valley to Le Fanu Road	S.1	N4	5302	5143	-159
		R113	1348	1159	-189
		Fonthill Road	1112	978	-134
		R833 Coldcut Road	1484	651	-833
		Neilstown Road	739	604	-134
		Ninth Lock Road	1514	1352	-162
		Cloverhill Road	1204	632	-572
		Kennelsfort Road Upper	1322	943	-379
Adjacent to Section 2 - Le Fanu Road to Sarsfield Road	S.2	R112 Kylemore Road	1408	859	-549
		R112 Lucan Road	813	674	-139
		R833 Con Colbert Road	401	172	-229
Adjacent to Section 3 - Sarsfield Road to City Centre	S.3	R810 Tyrconnell Road	1391	1164	-227
		R810 Naas Road	1494	1309	-185
		Bow Bridge	763	592	-171
		Bow Lane West	756	525	-231
		R148 St John's Road West	1525	1364	-161
		Chesterfield Avenue	830	712	-118
		R804 Blackhall Place	1495	1324	-172
		R804 Brunswick Street North	919	808	-111
		R108 Church Street Upper	1383	1240	-143
		R804 / R132 King Street North	1652	1440	-211
		R804 / R132 Bolton Street	1791	1622	-169
		R108 / R132 Church Street	1625	1431	-195
		R108 Father Mathew Bridge	2152	1685	-466
		R108 Bridge Street Lower	2587	1606	-980
		R108 Bridge Street Upper	2225	1057	-1168
		R137 Lord Edward Street	837	640	-196
		R137 Nicholas Street	658	440	-218
		Bride Road	676	468	-208
		Bride Street	954	731	-223
		R137 Patrick Street	675	468	-206
		St Patrick's Close	806	701	-105
		R137 New Street South	1130	1026	-104
		R804 Meath Street	344	168	-176
		Ardee Street	520	388	-132
		St Thomas Road	309	201	-107

The contents of Table 6.51 demonstrate that the general traffic flow reductions along the indirect study area varies between -104 and -1,168 during the AM Peak Hour of the 2028 Opening Year.

Along Section 1 of the Proposed Scheme there is a slight to very significant reduction of between -134 (Neilstown Road) and -833 (R833 Coldcut Road) in general traffic flows along the indirect study area. However, along Section 2 of the Proposed Scheme there is a slight to significant reduction of between -139 (R112 Lucan Road) and -549 (R112 Kylemore Road) in general traffic flows along the indirect study area. Whilst, along Section 3 of the Proposed Scheme there is a slight to profound reduction of between -104 (R137 New Street South) and -1,168 (R108 Bridge Street Upper) in general traffic flows along the indirect study area.

Overall, the reductions in general traffic flows along the indirect study area during the AM Peak Hour of the 2028 Opening Year have been determined to have a **Positive, Slight and Long-term effect**.

Indirect Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the orange / red lines in Diagram 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 6.52.

Table 6.52: Road Links Exceeding the 100 Flow Additional Traffic Threshold during the AM Peak Hour (Indirect Study Area)

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Adjacent to Section 1 – Liffey Valley to Le Fanu Road	1.1	R113 Fonthill Road North	1693	2099	406
	1.2	Ninth Lock Road	1095	1373	278
	1.3	Station Road	1118	1276	158
	1.4	Palmerston Way	1193	1364	172
	1.5	M50	6250	6459	209
	1.6	Kennelsfort Road Upper	930	1038	108
	1.7	Park West Avenue	1534	1637	103
	1.8	R134 New Nangor Road	1741	1851	110
Adjacent to Section 2 - Le Fanu Road to Sarsfield Road	2.1	Le Fanu Road	384	624	240
	2.2	Kylemore Avenue	169	406	237
	2.3	Killeen Road	1250	1373	123
	2.4	R109 Chapelizod Road	727	944	217
	2.5	R148 Chapelizod Bypass	1770	1956	186
Adjacent to Section 3 - Sarsfield Road to City Centre	3.1	Bulfin Road	539	730	190
	3.2	R111 South Circular Road	1376	1857	482
	3.3	R811 South Circular Road	1314	1437	123
	3.4	R111 Suir Road	629	830	201
	3.5	R812 Davitt Road	1268	1377	109
	3.6	R111 Dolphin Road	930	1192	262
	3.7	James's Walk	449	789	340
	3.8	Forbes Lane	339	523	184
	3.9	Grand Canal Place	559	828	269
	3.10	Bellevue	430	642	212
	3.11	Crane Street	262	365	103
	3.12	Watling Street	349	563	214
	3.13	Rory O'More Bridge	540	643	103
	3.14	R148 Arran Quay	1008	1124	116
	3.15	Oliver Bond Street	602	746	144
	3.16	Wormwood Gate	525	639	114
	3.17	R110 St Luke's Avenue	674	777	103
	3.18	Francis Street	94	475	381
	3.19	R110 The Coombe	1104	1405	301
	3.20	R110 Dean Street	1036	1343	308
	3.21	R110 Kevin Street Upper	773	987	214
	3.22	R148 Merchant's Quay	727	1136	408
	3.23	R148 Wood Quay	788	1247	459
	3.24	R148 Essex Quay	768	946	177
	3.25	R148 Wellington Quay	647	799	152
	3.26	R114 South Great George's Street	496	623	128
	3.27	R114 Aungier Street	454	612	158
	3.28	R114 Redmond Hill	909	1028	119

The contents of Table 6.52 outline that the additional traffic on the key road links within the indirect study area varies between 103 and 482 combined flows during the AM Peak Hour of the 2028 Opening Year.

Along Section 1 of the Proposed Scheme there is a slight to significant increase of between 103 (Park West Avenue) and 406 (R113 Fonthill Road North) in general traffic flows along the indirect study area. However, along Section 2 of the Proposed Scheme there is a slight increase of between 123 (Killeen Road) and 240 (Le Fanu Road) in general traffic flows along the indirect study area. Whilst, along Section 3 of the Proposed Scheme there is a slight to significant increase of between 103 (Rory O'More Bridge, St Luke's Avenue) and 482 (R111 South Circular Road) in general traffic flows along the indirect study area.

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 Scheme.

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.

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 Scheme, the junctions and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6.53.

Table 6.53: National Road Links 2028 (AM Peak Hour)

Junction	Total Do Minimum Turning Flows (PCUs)	Total Do Something Turning Flows (PCUs)	Turning Flow Difference (PCUs)	Percentage Difference
N4 Junction 2	9,723	9,687	-36	0%
M4 / M50 Junction 1	16,996	17,256	260	2%
M50 / N3 Junction	14,227	14,310	83	1%
M50 / N7 Junction	20,299	20,517	218	1%

The contents of Table 6.53 demonstrate that redistributed traffic from the Proposed Scheme will have a less than 5% impact on turning flows at junctions with national roads, therefore, no further assessment of the national junctions in the AM Peak Hour has been undertaken.

6.4.6.3.8.4 General Traffic Flow Difference – PM Peak Hour

Diagram 6.28 (extract from Figure 6.8 in Volume 3 of this EIAR) illustrates the difference in traffic flows on the road links in the PM Peak Hour for the 2028 Opening Year. Please see Appendix A6.4.4 (General Traffic Assessment) in Volume 4 of this EIAR for the full LAM outputs.

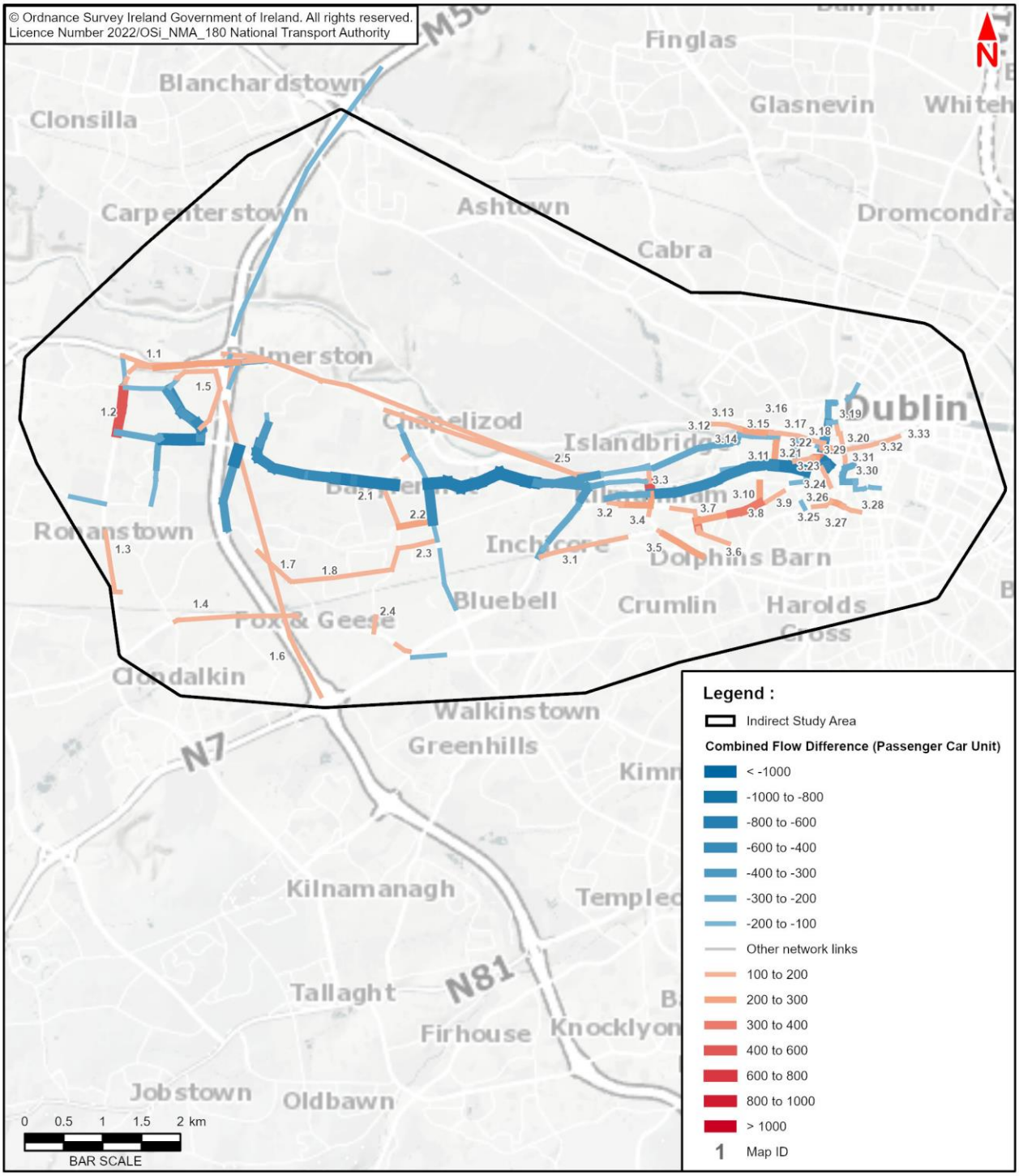


Diagram 6.28: Flow Difference on Road Links (Do Minimum vs Do Something), PM Peak Hour, 2028 Opening Year

Impact on Direct Study Area (PM Peak Hour)

Direct Reductions in General Traffic Flows: The LAM indicates that, during the 2028 Opening Year scenario, there are reductions in general traffic noted along the Proposed Scheme during the PM Peak Hour, as illustrated by the blue lines in Diagram 6.28Diagram 6.28, which indicates where a reduction of at least -100 combined traffic flows occur.

The key reductions in traffic flows during the PM Peak Hour are outlined in Table 6.54.

Table 6.54: Road Links that Experience a Reduction of ≥100 Combined Flows during PM Peak Hour (Direct Study Area)

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Section 1 - Liffey Valley to Le Fanu Road	S.1	Fonthill Road	561	102	-469
		R833 Coldcut Road	2166	1155	-1011
		R833 Ballyfermot Road	1246	570	-677
Section 2 - Le Fanu Road to Sarsfield Road	S.2	R833 Ballyfermot Road	1195	147	-1048
		R112 Kylemore Road	1048	800	-249
		R833 Sarsfield Road	1159	502	-657
		Sarsfield Road	558	238	-320
Section 3 - Sarsfield Road to City Centre	S.3	R839 Inchicore Road	897	610	-286
		R839 Grattan Crescent	817	505	-312
		R810 Emmet Road	816	563	-253
		R810 Old Kilmainham	760	206	-554
		R810 Mount Brown	770	215	-555
		R810 James Street	1187	608	-578
		R810 Thomas Street	1178	313	-865
		R810 Cornmarket	1616	648	-968
		R108 High Street	1596	632	-964

The contents of Table 6.54 demonstrate that the general traffic flow reductions along the direct study area varies between -249 and -1,048 during the PM Peak Hour of the 2028 Opening Year.

Impact on Indirect Study Area (PM Peak Hour)

Indirect Reductions in General Traffic Flows: In addition to the traffic flow reductions occurring along the direct study area, there are key reductions in general traffic noted along certain road links within the indirect study area during the PM Peak Hour. They key reductions in traffic flows along the indirect study area during the PM Peak Hour are outlined in Table 6.55.

Table 6.55: Road Links that Experience a Reduction of ≥ 100 Combined Flows during PM Peak Hour (Indirect Study Area)

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Adjacent to Section 1 - Liffey Valley to Le Fanu Road	S.1	M50	643	487	-156
		R113	1056	911	-144
		Fonthill Road	348	59	-289
		R833 Coldcut Road	1577	959	-617
		Newlands Road	1559	1459	-100
		Neilstown Road	1333	1080	-253
		Cloverhill Road	1153	523	-631
		Kennelsfort Road Upper	1372	799	-574
Adjacent to Section 2 - Le Fanu Road to Sarsfield Road	S.2	R112 Kylemore Road	1206	803	-403
		R110 Long Mile Road	517	416	-101
		R833 Con Colbert Road	539	204	-335

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Adjacent to Section 3 - Sarsfield Road to City Centre	S.3	R148 Chapelizod Bypass	1155	894	-261
		R839 Inchicore Road	264	142	-123
		R810 Tyrconnell Road	1114	879	-235
		R810 Naas Road	1389	1165	-224
		R148 St John's Road West	1090	879	-210
		R148 Victoria Quay	1900	1728	-171
		Bow Lane West	664	500	-164
		R804 Bridgefoot Street	391	275	-116
		R804 Meath Street	434	314	-119
		R804 Earl Street South	304	191	-113
		R108 Bridge Street Upper	1991	889	-1102
		R108 Bridge Street Lower	2262	1464	-798
		R148 Usher's Quay	1914	1795	-119
		R108 Father Mathew Bridge	1768	1343	-425
		R108 / R132 Church Street	1518	1204	-314
		Mary's Lane	287	180	-107
		R804 / R132 King Street North	1513	1300	-213
		R804 / R132 Bolton Street	1403	1271	-132
		R137 Christchurch Place	948	709	-240
		R137 Nicholas Street	1021	754	-267
		Bride Road	553	302	-251
		Bride Street	877	697	-181
		Golden Lane	578	474	-104
		Longford Street Little	378	263	-115
		Ardee Street	420	317	-103

The contents of Table 6.55 demonstrate that the general traffic flow reductions along the indirect study area varies between -100 and -1,102 during the PM Peak Hour of the 2028 Opening Year.

Along Section 1 of the Proposed Scheme there is a slight to significant reduction of between -100 (Newlands Road) and -631 (Cloverhill Road) in general traffic flows along the indirect study area. However, along Section 2 of the Proposed Scheme there is a slight to significant reduction of between -101 (R110 Long Mile Road) and -403 (R112 Kylemore Road) in general traffic flows along the indirect study area. Whilst, along Section 3 of the Proposed Scheme there is a slight to profound reduction of between -103 (Ardee Street) and -1,102 (R108 Bridge Street Upper) in general traffic flows along the indirect study area.

Overall, the reductions in general traffic flows along the indirect study area during the AM Peak Hour of the 2028 Opening Year have been determined to have a **Positive, Slight and Long-term effect**.

Indirect Increases in General Traffic Flows: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the orange / red lines in Diagram 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 PM Peak Hour are outlined in Table 6.56.

Table 6.56: Road links Exceeding the 100 Flow Additional Traffic Threshold during the PM Peak Hour (Indirect Study Area)

Section	Map I.D.	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Adjacent to Section 1 – Liffey Valley to Le Fanu Road	1.1	N4	4821	5033	212
	1.2	R113 Fonthill Road North	1513	1992	479
	1.3	R113	1499	1652	153
	1.4	R134 New Nangor Road	2077	2206	130
	1.5	Fonthill Road	473	695	222
	1.6	M50	945	1097	152
	1.7	Park West Avenue	744	886	143
	1.8	Park West Road	844	1019	175
Adjacent to Section 2 - Le Fanu Road to Sarsfield Road	2.1	Le Fanu Road	589	729	141
	2.2	Kylemore Avenue	152	427	276
	2.3	Kylemore Park North	562	698	137
	2.4	Killeen Road	883	1012	129
	2.5	R148 Chapelizod Bypass	767	951	184
Adjacent to Section 3 - Sarsfield Road to City Centre	3.1	R812 Davitt Road	955	1113	158
	3.2	Bulfin Road	276	497	221
	3.3	R111 South Circular Road	1251	1731	480
	3.4	R111 Suir Road	562	691	128
	3.5	R111 Dolphin Road	1007	1239	232
	3.6	R811 South Circular Road	1356	1673	317
	3.7	James's Walk	596	908	311
	3.8	Forbes Lane	442	556	114
	3.9	R804 Marrowbone Lane	574	684	110
	3.10	Grand Canal Place	393	614	222
	3.11	Watling Street	224	480	256
	3.12	R109 Conyngham Road	1854	1982	128
	3.13	R109 Parkgate Street	1451	1559	108
	3.14	R148 Frank Sherwin Bridge	1666	1766	100
	3.15	R148 Wolfe Tone Quay	859	1082	223
	3.16	R148 Sarsfield Quay	1175	1351	176
	3.17	R149 Ellis Quay	907	1027	120
	3.18	R148 Arran Quay	907	1049	142
	3.19	Greek Street	276	459	182
	3.20	Chancery Place	341	502	161
	3.21	Oliver Bond Street	446	669	223
	3.22	Wormwood Gate	370	726	357
	3.23	St Augustine Street	81	190	109
	3.24	Francis Street	55	226	172
	3.25	R110 St Luke's Avenue	907	1027	120
	3.26	R110 The Coombe	756	857	100
	3.27	R110 Dean Street	1098	1299	201
	3.28	R110 Kevin Street Upper	1059	1262	203
	3.29	R148 Merchant's Quay	837	1018	180
	3.30	Winetavern Street	1600	1827	228
	3.31	R148 Wood Quay	822	983	161
	3.32	R148 Essex Quay	1625	1790	165
	3.33	R148 Wellington Quay	1434	1588	154

The contents of Table 6.56 outline that the additional traffic on the key road links within the indirect study area varies between 100 and 480 combined flows during the PM Peak Hour of the 2028 Opening Year.

Along Section 1 of the Proposed Scheme there is a slight to significant increase of between 130 (R134 New Nangor Road) and 479 (R113 Fonthill Road North) in general traffic flows along the indirect study area. However, along Section 2 of the Proposed Scheme there is a slight increase of between 129 (Killeen Road) and 276 (Kylemore Avenue) in general traffic flows along the indirect study area. Whilst, along Section 3 of the Proposed Scheme there is a slight to significant increase of between 100 (The Coombe, R148 Frank Sherwin Bridge) and 480 (R111 South Circular Road) in general traffic flows along the indirect study area.

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 Scheme.

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.

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 Scheme, the junctions and associated flow difference between the Do Minimum and Do Something scenarios during the PM Peak Hour are outlined in Table 6.53.

Table 6.57: National Road Links 2028 (PM Peak Hour)

Junction	Total Do Minimum Turning Flows (vehicles)	Total Do Something Turning Flows (vehicles)	Turning Flow Difference (vehicles)	Percentage Difference
N4 Junction 2	98,30	9,778	-53	**-1%**
M4 / M50 Junction 1	17,165	17,195	30	0%
M50 / N3 Junction	13,657	13,694	37	0%
M50 / N7 Junction	20,248	20,299	50	0%

The contents of Table 6.53 demonstrate that redistributed traffic from the Proposed Scheme will have a less than 5% impact on turning flows at junctions with national roads, therefore, no further assessment of the national junctions in the PM Peak Hour has been undertaken.

6.4.6.3.8.5 General Traffic Impact Assessment

Following the above threshold assessment, the following three-step approach has been undertaken to determine the significance of the negative impact as a result of the redistributed general traffic on the indirect study area:

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 Scheme. 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 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 6.58.

Table 6.58: 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 6.59 have been used to describe the impact.

Table 6.59: 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

As indicated in Table 6.59, the changes in V / C ratios between the Do Minimum and Do Something scenarios result in either a positive, negative or negligible 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.

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. The full analysis tables for each scenario, demonstrating the Do Minimum and Do Something Peak Hour traffic flows and maximum V / C ratio for each junction assessed is detailed in Table 14 to Table 17 of Appendix A6.4.4 (General Traffic Assessment) in Volume 4 of this EIAR.

General Traffic Impact Assessment (2028 Opening Year) - Indirect Study Area - AM Peak Hour

The contents of Table 6.60 outline the maximum V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2028 Opening Year at junctions where the ratio exceeds 100% in the Do Something scenario, or the significance of effect is slight or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2028 AM Peak Hour are illustrated in Figure 6.9 in Volume 3 of this EIAR.

Table 6.60: Volume over Capacity Ratios at Key Junctions (Do Minimum vs Do Something), AM Peak Hour, 2028 Opening Year

Road Name	Road Sensitivity	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%		
Ninth Lock Road	Medium	Ninth Lock Road / Neilstown Road (25470)	✓				✓		Low Negative	Moderate Negative
	Medium	Ninth Lock Road / Station Road (25236)			✓			✓	Low Negative	Moderate Negative
Palmerstown Way	Medium	Cloverhill Road / Park West Avenue / Palmerstown Way (14202)	✓				✓		Low Negative	Moderate Negative
Killeen Road	Negligible	Naas Road / Killeen Road (16181)			✓			✓	Low Negative	Not Significant
R109 Chapelizod Road	Low	Chapelizod Road / Main Street (12250)			✓			✓	Negligible	Not Significant
	Negligible	Chapelizod Road / Conyngham Road / South Circular Road (12208)			✓			✓	Low Negative	Not Significant
R148 Chapelizod Bypass	Negligible	Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106)			✓			✓	Low Negative	Not Significant
	Negligible	Chapelizod Bypass / Memorial Road (14124)			✓			✓	Low Negative	Not Significant
R811 South Circular Road	Medium	South Circular Road / Brookfield Road (7196)	✓				✓		Low Negative	Moderate Negative
Bellevue	High	Bellevue / School Street (7255)	✓				✓		Low Negative	Moderate Negative
Rory O'More Bridge	Low	Victoria Quay / Rory O'More Bridge / Usher's Island / Watling Street (3144)	✓				✓		Low Negative	Slight Negative
Wormwood Gate	Low	Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)	✓					✓	High Negative	Moderate Negative
R110 The Coombe	Low	The Coombe / Francis Street / Dean Street (6185)	✓				✓		Low Negative	Slight Negative
R148 Merchant's Quay	Low	Usher's Quay / Merchant's Quay / Lower Bridge Street (2303)		✓		✓			Low Positive	Slight Positive

The results of the junction analysis illustrated in Table 6.60 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the AM Peak Hour of the 2028 Opening Year and that the

Proposed Scheme 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:

- Ninth Lock Road / Station Road (25236) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Naas Road / Killeen Road (16181) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Road / Main Street (12250) – operates above 100% during both the Do Minimum and Do Something scenarios. Although the V/C operates above 100% during both scenarios, in the Do Something scenario the V/C ratio reduces and is therefore considered to have a Negligible impact;
- Chapelizod Road / Conyngham Road / South Circular Road (12208) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Memorial Road (14124) – operates above 100% during both the Do Minimum and Do Something scenarios; and
- Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251) – operates below 85% during the Do Minimum scenario and increases to operate above 100% during the Do Something scenario.

Notwithstanding this, the significance of effect is concluded to be **Negative, Moderate and Long-term** at two of these seven junctions due to the low sensitivity of these road links. At the remaining two junctions the significance of effect is concluded to be either **Not Significant and Long-term** as the V / C ratio is above 100% in both scenarios, therefore the performance of the junction is similar with or without the Proposed Scheme.

At the remaining junctions, the effect of redistributed traffic associated with the Proposed Scheme is deemed **Slight, Negative and Long-term or Moderate, Negative and Long-term** although the junction of Usher's Quay / Merchant's Quay / Lower Bridge Street sees a **Slight Positive, Long term** impact.

General Traffic Impact Assessment (2028 Opening Year) - Indirect Study Area - PM Peak Hour

The contents of Table 6.61 outline the maximum V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2028 Opening Year at junctions where the ratio exceeds 100% in the Do Something scenario, or the significance of effect is slight or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2028 AM Peak Hour are illustrated in Figure 6.9 in Volume 3 of this EIAR.

Table 6.61: Volume over Capacity Ratios at Key Junctions (Do Minimum vs Do Something), PM Peak Hour, 2028 Opening Year

Road Name	Road Sensitivity	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%		
R113	Low	St Lomans Road / Fonthill Road / Fonthill Road North (25129)			✓			✓	Negligible	Not Significant
	Low	Thomas Omer Way / Ninth Lock Road (25235)			✓		✓		Low Positive	Slight Positive
R134 New Nangor Road	Medium	New Nangor Road / Woodford Walk (25459)			✓			✓	Low Negative	Moderate Negative
R148 Chapelizod Bypass	Negligible	Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106)			✓			✓	Negligible	Imperceptible
	Negligible	Chapelizod Bypass / Lucan Road / The Oval (22117)			✓			✓	Low Negative	Not Significant
	Negligible	Chapelizod Bypass / Memorial Road (14124)			✓			✓	Low Negative	Not Significant
R812 Davitt Road	Low	Naas Road / Davitt Road (8392)		✓				✓	Medium Negative	Moderate Negative
R811 South Circular Road	Medium	South Circular Road / Glenmalure Park / Herberton Road (7172)	✓				✓		Low Negative	Moderate Negative
R109 Conyngham Street	Negligible	Conyngham Street / Infirmary Road / Parkgate Street (3243)			✓			✓	Negligible	Imperceptible
R148 Frank Sherwin Bridge	Low	Frank Sherwin Bridge / Victoria Quay / St John's Road West (3171)	✓				✓		Low Negative	Slight Negative
Wormwood Gate	Low	Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)	✓				✓		Low Negative	Slight Negative
R110 Kevin Street Upper	Low	Kevin Street Upper / Bishop Street / Kevin Street Lower / New Bride Street (6183)	✓				✓		Low Negative	Slight Negative
R148 Merchant's Quay	Low	Usher's Quay / Merchant's Quay / Lower Bridge Street (2303)	✓				✓		Low Negative	Slight Negative
Winetavern Street	Low	High Street / Winetavern Street / Christchurch Place / Nicholas Street (6200)			✓	✓			Medium Positive	Moderate Positive

The results of the junction analysis illustrated in Table 6.621 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the PM Peak Hour of the 2028 Opening Year and that the Proposed Scheme 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:

- St Lomans Road / Fonthill Road / Fonthill Road North (25129) – operates above 100% during both the Do Minimum and Do Something scenarios. Although the V/C operates above 100% during both scenarios, in the Do Something scenario the V/C ratio reduces and is therefore considered to have a Negligible impact;
- Thomas Omer Way / Ninth Lock Road (25235) – operates above 100% during the Do Minimum scenario but drops to between 85% and 100% during the Do Something scenario;

- New Nangor Road / Woodford Walk (25459) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106) – operates above 100% during both the Do Minimum and Do Something scenarios. Although the V/C operates above 100% during both scenarios, in the Do Something scenario the V/C ratio reduces and is therefore considered to have a Negligible impact;
- Chapelizod Bypass / Lucan Road / The Oval (22107) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / The Memorial (14124) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Naas Road / Davitt Road (8392) – operates between 85% and 100% during the Do Minimum scenario and increases to operate above 100% during the Do Something scenario;
- Conyngham Street / Infirmary Road / Parkgate Street (3243) – operates above 100% during both the Do Minimum and Do Something scenarios. Although the V/C operates above 100% during both scenarios, in the Do Something scenario the V/C ratio reduces and is therefore considered to have a Negligible impact; and
- High Street / Winetavern Street / Christchurch Place / Nicholas Street (6200) – operates above 100% during the Do Minimum scenario but drops to below 85% during the Do Something scenario.

Notwithstanding this, the significance of effect is concluded to be **Negative, Moderate and Long-term** at two of these nine junctions due to the low sensitivity of these road links. At six of the remaining seven junctions the significance of effect is concluded to be either **Not Significant and Long-term or Imperceptible** as the V / C ratio is above 100% in both scenarios, therefore the performance of the junction is similar with or without the Proposed Scheme. At the seventh junction, which sees a reduction in V/C a **Moderate Positive and Long-term** impact is observed.

At the remaining junctions, the effect of redistributed traffic associated with the Proposed Scheme is deemed **Slight, Negative and Long-Term or Moderate, Negative and Long-term**.

General Traffic Impact Assessment (2043 Opening Year) - Indirect Study Area - AM Peak Hour

The contents of Table 6.62 outline the maximum V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2028 Opening Year at junctions where the ratio exceeds 100% in the Do Something scenario, or the significance of effect is slight or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2028 AM Peak Hour are illustrated in Figure 6.9 in Volume 3 of this EIAR.

Table 6.62: Volume over Capacity Ratios at Key Junctions (Do Minimum vs Do Something), AM Peak Hour, 2043 Design Year

Road Name	Road Sensitivity	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%		
R113 Fonthill Road North	Low	Newlands Road / Fonthill Road North / Balgaddy Road (25375)			✓		✓		Low Positive	Slight Positive
Ninth Lock Road	Medium	Ninth Lock Road / Station Road (25236)			✓			✓	Low Negative	Moderate Negative
Palmerstown Way	Medium	Cloverhill Road / Park West Avenue / Palmerstown Way (14202)	✓				✓		Low Negative	Moderate Negative
Le Fanu Road	Negligible	Le Fanu Road / Kylemore Road / Chapelizod Hill Road (14211)		✓		✓			Low Positive	Moderate Positive
Killeen Road	Negligible	Naas Road / Killeen Road (16181)			✓			✓	Low Negative	Not Significant
R109 Chapelizod Road	Low	Chapelizod Road / Main Street (12250)			✓		✓		Low Positive	Slight Positive
	Negligible	Chapelizod Road / Conyngham Road / South Circular Road (12208)			✓			✓	Low Negative	Not Significant
R148 Chapelizod Bypass	Negligible	Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106)			✓			✓	Low Negative	Not Significant
	Negligible	Chapelizod Bypass / Memorial Road (14124)			✓			✓	Low Negative	Not Significant
R811 South Circular Road	Medium	South Circular Road / Brookfield Road (7196)	✓				✓		Low Negative	Moderate Negative
Bellevue	High	Bellevue / School Street (7255)	✓				✓		Low Negative	Moderate Negative
Wormwood Gate	Low	Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)	✓					✓	High Negative	Moderate Negative
R110 The Coombe	Low	The Coombe / Francis Street / Dean Street (6185)	✓				✓		Low Negative	Slight Negative
R148 Merchant's Quay	Low	Usher's Quay / Merchant's Quay / Lower Bridge Street (2303)		✓		✓			Low Positive	Slight Positive

The results of the junction analysis illustrated in Table 6.62 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the AM Peak Hour of the 2043 Design Year and that the Proposed Scheme 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:

- Newlands Road / Fonthill Road North / Balgaddy Road (25375) – operates above 100% during the Do Minimum scenario but drops to between 85% and 100% during the Do Something scenario;
- Ninth Lock Road / Station Road (25236) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Naas Road / Killeen Road (16181) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Road / Main Street (12250) – operates above 100% during the Do Minimum scenario but drops to between 85% and 100% during the Do Something scenario;

- Chapelizod Road / Conyngham Road / South Circular Road (12208) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Memorial Road (14124) – operates above 100% during both the Do Minimum and Do Something scenarios; and
- Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251) – operates below 85% during the Do Minimum scenario and increases to operate above 100% during the Do Something scenario.

Notwithstanding this, the significance of effect is concluded to be **Negative, Moderate and Long-term** at five junctions**,** and **Slight, Negative and Long-term** at one junction. Conversely, positive effects are seen at four junctions, three which see **Slight, Positive and Long-term** impacts and one which has a **Moderate, Positive Long-term** impacts.

At the remaining junctions, the effect of redistributed traffic associated with the Proposed Scheme is deemed **Slight, Negative and Long-term**.

General Traffic Impact Assessment (2043 Design Year) - Indirect Study Area - PM Peak Hour

The contents of Table 6.63 outline the maximum V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2028 Opening Year at junctions where the ratio exceeds 100% in the Do Something scenario, or the significance of effect is slight or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2028 AM Peak Hour are illustrated in Figure 6.9 in Volume 3 of this EIAR.

Table 6.63: Volume over Capacity Ratios at Key Junctions (Do Minimum vs Do Something), PM Peak Hour, 2043 Design Year

Road Name	Road Sensitivity	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%		
R113	Low	St Lomans Road / Fonthill Road / Fonthill Road North (25129)			✓			✓	Low Negative	Slight Negative
	Low	Thomas Omer Way / Ninth Lock Road (25235)			✓		✓		Low Positive	Slight Positive
	Low	R113 (25220)			✓			✓	Low Negative	Slight Negative
R134 New Nangor Road	Medium	New Nangor Road / Woodford Walk (25459)			✓			✓	Negligible	Not Significant
Killeen Road	Medium	Park West Road / Killeen Road (14214)	✓				✓		Low Negative	Moderate Negative
R148 Chapelizod Bypass	Negligible	Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106)			✓			✓	Negligible	Imperceptible
	Negligible	Chapelizod Bypass / Lucan Road / The Oval (22117)			✓			✓	Low Negative	Not Significant
	Negligible	Chapelizod Bypass / Memorial Road (14124)			✓			✓	Low Negative	Not Significant
R811 South Circular Road	Medium	South Circular Road / Glenmalure Park / Herberton Road (7172)	✓				✓		Low Negative	Moderate Negative
R148 Frank Sherwin Bridge	Low	Frank Sherwin Bridge / Victoria Quay / St John's Road West (3171)	✓				✓		Low Negative	Slight Negative
R148 Arran Quay	Low	Arran Quay / Church Street / Inns Quay (2100)	✓				✓		Low Negative	Slight Negative
Wormwood Gate	Low	Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)	✓				✓		Low Negative	Slight Negative
R148 Merchant's Quay	Low	Usher's Quay / Merchant's Quay / Lower Bridge Street (2303)	✓				✓		Low Negative	Slight Negative
R109 Conyngham Street	Negligible	Conyngham Street / Infirmary Road / Parkgate Street (3243)			✓		✓		Low Positive	Not Significant
Winetavern Street	Low	High Street / Winetavern Street / Christchurch Place / Nicholas Street (6200)			✓	✓			Medium Positive	Significant Positive

The results of the junction analysis illustrated in Table 6.63 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the PM Peak Hour of the 2043 Design Year and that the Proposed Scheme 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:

- St Lomans Road / Fonthill Road / Fonthill Road North (25129) – operates above 100% during both the Do Minimum and Do Something scenarios;

- Thomas Omer Way / Ninth Lock Road (25235) – operates above 100% during the Do Minimum scenario but drops to between 85% and 100% during the Do Something scenario;
- R113 Roundabout (25220) – operates above 100% during both the Do Minimum and Do Something scenarios;
- New Nangor Road / Woodford Walk (25459) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106) – operates above 100% during both the Do Minimum and Do Something scenarios. Although the V/C operates above 100% during both scenarios, in the Do Something scenario the V/C ratio marginally reduces and is therefore considered to have a Negligible impact;
- Chapelizod Bypass / Lucan Road / The Oval (22107) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Chapelizod Bypass / Memorial Road (14124) – operates above 100% during both the Do Minimum and Do Something scenarios;
- Conyngham Street / Infirmary Road / Parkgate Street (3243) – operates above 100% during the Do Minimum scenario but drops to between 85% and 100% during the Do Something scenario; and
- High Street / Winetavern Street / Christchurch Place / Nicholas Street (6200) – operates above 100% during the Do Minimum scenario but drops to below 85% during the Do Something scenario.

Notwithstanding this, the significance of effect is concluded to be **Negative, Moderate and Long-term** at just two junctions**,** and **Slight, Negative and Long-term** at six junctions. Conversely, positive effects are seen at two junctions, one which sees a **Slight, Positive and Long-term** impact and one which has a **Significant, Positive Long-term** impact.

At the remaining junctions, the effect of redistributed traffic associated with the Proposed Scheme is deemed **Slight, Negative and Long-term**.

6.4.6.3.8.6 Night-time Traffic Redistribution

The night-time period is defined as between 23:00 and 07:00. An analysis of traffic data during this period indicates that traffic levels are considerably lower and that junctions have a higher capacity for vehicular movement (less pedestrian, cycling and bus demand requirements leading to higher level of general traffic green time allocation per typical signal cycle). Automatic Traffic Counter data demonstrates that, typically, within Dublin the night-time period has approximately 19% of the traffic levels compared to the morning peak hour (08:00-09:00). As a result, during the night-time period junctions do not experience flows in excess of capacity which would result in queuing and in turn potential re-distribution of traffic to alternative routes to avoid congestion. Therefore, the effects of traffic redistribution due to any of the Proposed Schemes will be **Negligible and Long-term** during the night-time period.

6.4.6.3.8.7 General Traffic Impact Assessment Summary

Given the improvements to bus priority, walking and cycling as a result of the Proposed Scheme, there will likely be an overall reduction in operational capacity for general traffic along the direct study area. This may in turn result in some redistribution of general traffic away from the main corridor onto the surrounding road network.

Using the TII guidelines as an indicator for best practice, the LAM Opening Year 2028 model results were used to identify the difference in traffic flows between the Do Minimum and Do Something scenarios. The following thresholds have been used to identify where a further assessment is required:

- **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 Scheme in the AM and PM peak hours; and

- **National Roads:** Traffic exceeds 5% of the combined turning flows at 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 Scheme in place.

The threshold impact assessment identified the following roads that experience a reduction of at least -100 combined traffic flows during the Do Something scenario with the Proposed Scheme in place:

- **AM Peak Hour:** Fonthill Road, R833 Coldcut Road, R833 Ballyfermot Road, R833 Ballyfermot Road, R112 Kylemore Road, R833 Sarsfield Road, Sarsfield Road, R839 Inchicore Road, R839 Grattan Crescent, R810 Emmet Road, R810 Old Kilmainham, R810 Mount Brown, R810 James Street, R810 Thomas Street, R810 Cornmarket, R108 High Street, N4, R113 Fonthill Road, R833 Coldcut Road, Neilstown Road, Ninth Lock Road, Cloverhill Road, Kennelsfort Road Upper, R112 Kylemore Road, R112 Lucan Road, R833 Con Colbert Road, R810 Tyrconnell Road, R810 Naas Road, Bow Bridge, Bow Lane West, R148 St John's Road West, Chesterfield Avenue, R804 Blackhall Place, R804 Brunswick Street North, R108 Church Street Upper, R804 / R132 King Street North, R804 / R132 Bolton Street, R108 / R132 Church Street, R108 Father Mathew Bridge, R108 Bridge Street Lower, R108 Bridge Street Upper, R137 Lord Edward Street, R137 Nicholas Street, Bride Road, Bride Street, R137 Patrick Street, St Patrick's Close, R137 New Street South, R804 Meath Street, Ardee Street, St Thomas Road; and
- **PM Peak Hour:** Fonthill Road, R833 Coldcut Road, R833 Ballyfermot Road, R833 Ballyfermot Road, R112 Kylemore Road, R833 Sarsfield Road, Sarsfield Road, R839 Inchicore Road, R839 Grattan Crescent, R810 Emmet Road, R810 Old Kilmainham, R810 Mount Brown, R810 James Street, R810 Thomas Street, R810 Cornmarket, R108 High Street, M50, R113, Fonthill Road, R833 Coldcut Road, Newlands Road, Neilstown Road, Cloverhill Road, Kennelsfort Road Upper, R112 Kylemore Road, R110 Long Mile Road, R833 Con Colbert Road, R148 Chapelizod Bypass, R839 Inchicore Road, R810 Tyrconnell Road, R810 Naas Road, R148 St John's Road West, R148 Victoria Quay, Bow Lane West, R804 Bridgefoot Street, R804 Meath Street, R804 Earl Street South, R108 Bridge Street Upper, R108 Bridge Street Lower, R148 Usher's Quay, R108 Father Mathew Bridge, R108 / R132 Church Street, Mary's Lane, R804 / R132 King Street North, R804 / R132 Bolton Street, R137 Christchurch Place, R137 Nicholas Street, Bride Road, Bride Street, Golden Lane, Longford Street Little, Ardee Street

The threshold impact assessment also identified the following roads that experience an increase in traffic flows and require further traffic analysis:

- **AM Peak Hour:** R113 Fonthill Road North, Ninth Lock Road, Station Road, Palmerston Way, M50, Kennelsfort Road Upper, Park West Avenue, R134 New Nangor Road, Le Fanu Road, Kylemore Avenue, Killeen Road, R109 Chapelizod Road, R148 Chapelizod Bypass, Bulfin Road, R111 South Circular Road, R811 South Circular Road, R111 Suir Road, R812 Davitt Road, R111 Dolphin Road, James's Walk, Forbes Lane, Grand Canal Place, Bellevue, Crane Street, Watling Street, Rory O'More Bridge, R148 Arran Quay, Oliver Bond Street, Wormwood Gate, R110 St Luke's Avenue, Francis Street, R110 The Coombe, R110 Dean Street, R110 Kevin Street Upper, R148 Merchant's Quay, R148 Wood Quay, R148 Essex Quay, R148 Wellington Quay, R114 South Great George's Street, R114 Aungier Street, R114 Redmond Hill; and
- **PM Peak Hour: N4,** R113 Fonthill Road North, R113, R134 New Nangor Road, Fonthill Road, M50, Park West Avenue, Park West Road, Le Fanu Road, Kylemore Avenue, Kylemore Park North, Killeen Road, R148 Chapelizod Bypass, R812 Davitt Road, Bulfin Road, R111 South Circular Road, R111 Suir Road, R111 Dolphin Road, R811 South Circular Road, James's Walk, Forbes Lane, R804 Marrowbone Lane, Grand Canal Place, Watling Street, R109 Conyngham Road, R109 Parkgate Street, R148 Frank Sherwin Bridge, R148 Wolfe Tone Quay, R148 Sarsfield Quay, R149 Ellis Quay, R148 Arran Quay, Greek Street, Chancery Place, Oliver Bond Street, Wormwood Gate, St Augustine Street, Francis Street, R110 St Luke's Avenue, R110 The Coombe, R110 Dean Street, R110 Kevin Street Upper, R148 Merchant's Quay, Winetavern Street, R148 Wood Quay, R148 Essex Quay, R148 Wellington Quay.

The general traffic impact assessment on the indirect study area has been undertaken by extracting operational capacities from the LAM at the key junctions along the above road links identified in the threshold impact assessment.

The results are presented in terms of the significance of the change in V / C ratio for each junction based on its sensitivity and magnitude of impact. To undertake a robust assessment, the operational capacity outputs have been presented with reference to the worst performing arm of a junction that experiences the maximum V / C ratio.

The overall results of this assessment can be summarised as follows:

- The majority of assessed junctions have V / C ratios of below 85%, i.e. they are operating well within capacity for all assessed years in both the Do Minimum and Do Something scenarios. This indicates that these junctions will be able to accommodate any additional general traffic volumes redistributed as a result of the Proposed Scheme. The effect of the Proposed Scheme on the majority of junctions is deemed **Imperceptible or Not Significant and Long-term**;
- No junctions are predicted to experience a significance of effect that is significant or higher;
- A number of junctions have been identified as exceeding theoretical capacity, including:
    - Ninth Lock Road / Station Road (25236)
    - Naas Road / Killeen Road (16181)
    - Chapelizod Road / Main Street (12250)
    - Chapelizod Road / Conyngham Road / South Circular Road (12208)
    - Chapelizod Bypass / Kennelsfort Road Lower / Kennelsfort Road Upper (22106)
    - Chapelizod Bypass / Memorial Road (14124)
    - Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)
    - St Lomans Road / Fonthill Road / Fonthill Road North (25129);
    - New Nangor Road / Woodford Walk (25459)
    - Chapelizod Bypass / Lucan Road / The Oval (22107)
    - Naas Road / Davitt Road (8392)
    - Conyngham Street / Infirmary Road / Parkgate Street (3243)
    - R113 Roundabout (25220)

- There are a number of junctions which are predicted to experience a negative, moderate and long-term impact:
    - Ninth Lock Road / Neilstown Road (25470)
    - Ninth Lock Road / Station Road (25236)
    - Cloverhill Road / Park West Avenue / Palmerstown Way (14202)
    - South Circular Road / Brookfield Road (7196)
    - Bellevue / School Street (7255)
    - Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)
    - New Nangor Road / Woodford Walk (25459)
    - South Circular Road / Glenmalure Park / Herberton Road (7172)
    - Park West Road / Killeen Road (14214)

It should be noted that while there are moderate impacts to the operational capacity in the indirect study area, this level of congestion is acceptable according to national guidance. Section 3.4.2 of DMURS (2019) recognises that a certain level of traffic congestion is an inevitable feature within urban networks and that junctions may have to operate at saturation levels for short periods of time during the peak hours of the day. Chapter 1 of the Smarter Travel Policy Document also acknowledges that it is not feasible or sustainable to accommodate continued demand for car use. Therefore, it can be concluded that the traffic congestion that is outlined in the impact assessment is acceptable with regard to the urban location of the area.

Accordingly, it is determined that there will be an overall **Negative, Moderate and Long-term effect** impact from the redistributed general traffic as a result of the Proposed Scheme. Given that the redistributed traffic will not lead to a significant deterioration of the operational capacity on the surrounding road network, no further mitigation measures have been considered to alleviate the impact outside of the direct study area.

It should therefore be considered that the traffic congestion that is outlined in the impact assessment is acceptable with regard to the urban location of the area in the context of the increased movement of people overall and on sustainable modes in particular.

6.4.6.4 Operational Phase Summary

Based on the information and analysis presented within Section 6.4 (Operational Phase), the assessment determines how the Proposed Scheme has been designed from a traffic and transportation perspective, to integrate within the existing network and to minimise the adverse traffic impacts during the operational phase. The assessment demonstrates the following:

- **Pedestrian Infrastructure:** The Proposed Scheme consists of measures to enhance the existing pedestrian infrastructure along the direct study area. A Level of Service (LoS) junction assessment was undertaken using a set of five criteria to determine the impact that the Proposed Scheme has for pedestrians. The results of the 56 impacted junctions demonstrate that the LoS during the Do Minimum scenario consists of ratings ranging from A to F with approximately 57% of these junctions scoring a D or lower. During the Do Something scenario, i.e. following the development of the Proposed Scheme, the LoS consists predominantly of the highest A / B ratings, with the exception of three Cs. Overall, the improvements to the quality of the pedestrian infrastructure will be **Positive Significant and Long-term** along Section 1, 2 and 3 of the Proposed Scheme.
- **Cycling Infrastructure:** The Proposed Scheme also consists of measures to enhance the existing cycling infrastructure along the direct study area. A LoS assessment was undertaken using an adapted version of the NTA's National Cycle Manual Quality of Service (QoS) Evaluation criteria. The results of the assessment demonstrate that the LoS during the Do Minimum scenario consists predominantly of D ratings with the exception of two C ratings. During the Do Something scenario, the LoS consists predominantly of the B ratings, with the exception of two As, one C and four Ds. At three of the four locations which have a D rating in the Do Something, no bespoke cycle provision is proposed however a proposed local bus gates will greatly reduce through traffic creating an environment more conducive to cycling. Given the quality of the existing cycling infrastructure along the Proposed Scheme, the improvements will be **Positive, Profound and Long-term** in Section 1 and **Positive, Moderate and Long-term** in Section 2 and Section 3.
- **Bus Infrastructure:** The implementation of the Proposed Scheme will result in improvements in the quality of bus infrastructure provision along the direct study area. A qualitative impact assessment has been undertaken based on the provision of bus priority, pedestrian accessibility and changes to the bus stop facilities. The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will be **Positive, Profound and Long-term** in Section 1 and **Positive, Very Significant and Long-term** in Section 2 and Section 3 of the Proposed Scheme.
- **Parking and Loading:** A qualitative impact assessment has been undertaken of the Proposed Scheme impacts on the existing parking and loading. The results of the assessment demonstrate that the changes to the parking and loading provision will result in an overall loss of 173 spaces (-57 spaces in Section 1, -14 spaces in Section 2 and -102 spaces in Section 3) relative to an overall retention of 4,514 spaces. Given the nature of the loss in parking and the availability of alternative spaces in the indirect study area, the impact is expected to be **Negative, Slight and Long-term** in Section 1, Section 2 and Section 3.
- **People Movement:** Given the proposed amendments to the pedestrian, cycling, bus and parking / loading infrastructure outlined above, the Proposed Scheme will have greater capacity to facilitate the movement of people travelling along the corridor. A quantitative impact assessment has been undertaken using outputs from the NTA's ERM and LAM, comparing the Do Minimum and Do Something peak hour scenarios for each forecast year (2028, 2043). The results of the assessment demonstrate that there will be an increase in the number of people travelling along the corridor by sustainable modes of 54% and 52% during the 2028 AM and PM Peak respectively. During the 2043 scenario there will be an increase of 74% and 92% in the number of people travelling along the Proposed Scheme by sustainable modes during the AM and PM Peak Hours respectively. The analysis also shows that there will be an increase in 5.4% and 5.1% of passengers boarding buses during the 2028 AM and PM Peak Hours respectively. During the 2043 scenario there will be an increase in 7.0% and 7.6% of passengers boarding buses during the AM and PM Peak Hours respectively. Overall, it is anticipated that the increases to the total number of people travelling along the Proposed Scheme will be a **Positive, Very Significant and Long-term effect**.
- **Bus Network Performance Indicators**: The Proposed Scheme will also benefit from improvements to the capacity of the road network to cater for future bus services accessing the Proposed Scheme. A micro-simulation model assessment has been developed to extract network performance indicators of the bus operations along the 'end to end' corridor. The results of the assessment

demonstrate that the total bus journey times on all modelled bus services will improve by between 13% and 20% during the AM and PM Peak hours of the 2028 Opening Year and 2043 Opening Year + 15 Years.

- A LoS assessment was also undertaken using an adapted version of the Coefficient of Variation of Headways and the Fixed-Route Headway Adherence LoS (United States' TRB 2013) to determine the overall bus journey time reliability and bus service schedule reliability. The results of the assessment demonstrate that the bus journey time reliability achieves a LoS of B during all Do Minimum scenario and a LoS of A during all Do Something scenario. The bus services schedule reliability achieves a LoS of D/C during the Do Minimum scenario and a LoS B during three of the four, Do Something scenarios (a LOS C is anticipated in the 2043 AM Do Something). Overall, it is anticipated that the improvements to the network performance indicators for bus users along the Proposed Scheme will be **Positive, Moderate and Long-term.**
- **General Traffic Network Performance Indicators:** There will be an overall reduction in operational capacity for general traffic along the direct study area, given the proposed infrastructural changes to the existing road layout outlined above. This reduction in operational capacity for general traffic will create traffic redistribution from the Proposed Scheme onto the surrounding road network.
- The LAM Opening Year 2028 model results were used to identify the impact in traffic flows between the Do Minimum and Do Something scenarios. A reduction in general traffic flows along a road link has been described as a positive impact to the environment. The significance of the impact has been described in terms of the loss in traffic flows.
- An increase in general traffic flows along a road link has been described as a negative impact to the environment. Reference has been given to TII's Traffic and Transport Assessment Guidelines as an indicator for best practice, to determine the key road links that require further traffic analysis due to the increase in traffic. Operational capacities were extracted from the LAM at the associated junctions of the key road links to identify the impact that the Proposed Scheme will have on the Volume / Capacity ratios. 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.
- The results of the assessment demonstrate that the surrounding road network largely has the capacity to accommodate the redistributed general traffic as a result of the Proposed Scheme. The majority of assessed junctions that required further traffic analysis have V / C ratios that are broadly similar before and after the Proposed Scheme with the exception of the following junctions which experience moderate negative impacts:
    - Ninth Lock Road / Neilstown Road (25470)
    - Ninth Lock Road / Station Road (25236)
    - Cloverhill Road / Park West Avenue / Palmerstown Way (14202)
    - South Circular Road / Brookfield Road (7196)
    - Bellevue / School Street (7255)
    - Wormwood Gate / Lower Bridge Street / Cook Street / Upper Bridge Street (6251)
    - New Nangor Road / Woodford Walk (25459)
    - South Circular Road / Glenmalure Park / Herberton Road (7172)
    - Park West Road / Killeen Road (14214)
- Overall, it has been determined that the impact of the reduction in general traffic flows along the Proposed Scheme will be **Positive, Moderate and Long-term** whilst the impact of the redistributed general traffic along the surrounding road network will be **Negative, Moderate and Long-term**.

Table 6.64 presents a summary of the predicted impacts of the Proposed Scheme during the operational phase.

Table 6.64: Summary of Predicted Operational Phase Impacts

Assessment Topic	Effect	Predicted Impact
Pedestrian Infrastructure	Improvements to the quality of the pedestrian infrastructure along the Proposed Scheme.	Positive Significant and Long-term
Cycling Infrastructure	Improvements to the quality of the cycling infrastructure along the Proposed Scheme.	Positive, Moderate and Long-term to Positive, Profound and Long-term
Bus Infrastructure	Improvements to the quality of the bus infrastructure along the Proposed Scheme.	Positive, Very Significant and Long-term to Positive, Profound and Long-term
Parking and Loading	A total loss of 188 parking / loading spaces along the Proposed Scheme.	Negative, Slight and Long-term
People Movement	Increases in the total number of people travelling along the Proposed Scheme.	Positive, Very Significant and Long-term
Bus Network Performance Indicators	Improvements to the network performance indicators for bus users along the Proposed Scheme.	Positive, Significant and Long-term
General Traffic Network Performance Indicators	Reduction in general traffic flows along the Proposed Scheme.	Positive, Moderate and Long-term
	Redistributed general traffic along the surrounding road network in the indirect study area as a result of the reduction of reserve capacity along the Proposed Scheme.	Negative, Moderate and Long-term

As outlined within Section 6.4 (Operational Phase) and summarised in Table 6.64, the Proposed Scheme will deliver positive impacts to the quality of pedestrian, cycling and bus infrastructure during the Operational Phase providing for enhanced levels of People Movement in line with the scheme objectives. These improvements will help to provide an attractive alternative to the private car and promote a modal shift to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the sustainable movement of people as population and employment levels grow in the future.

The Proposed Scheme will address sustainable mode transport infrastructure deficits while contributing to an overall integrated sustainable transport system as proposed in the GDA Transport Strategy. It will increase the effectiveness and attractiveness of bus services operating along the corridor and will result in more people availing of public transport due to the faster, more reliable journey times which the Proposed Scheme provides. This in turn will support the future increase to the capacity of the bus network and services operating along the corridor and thereby further increasing the attractiveness of public transport. In addition to this, the significant segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Scheme will further maximise the movement of people travelling sustainably along the corridor. All of these changes combined will therefore cater for higher levels of future sustainable population and employment growth.

In the absence of the Proposed Scheme bus services will be operating in a more congested environment, leading to higher journey times and lower reliability for bus journeys. This limits their attractiveness to users which will lead to reduced levels of public transport use, making the bus system less resilient to higher levels of growth and leading to increased levels of car use and congestion. The absence of walking and cycling measures that the Proposed Scheme provides will also significantly limit the potential to grow those modes into the future.

On the whole, the Proposed Scheme will make a significant contribution to the overall aims of BusConnects, the GDA Transport Strategy and allow the city to grow sustainably into the future, which would not be possible in the absence of the Proposed Scheme.

6.5 Mitigation and Monitoring Measures

6.5.1 Construction Phase

Chapter 5 (Construction) has been prepared to demonstrate the likely approach that will be taken to construct the Proposed Scheme, while it also provides an overview of the construction activities necessary to undertake the works, including information on a proposed Construction Compound, 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 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, 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 will be prepared and included in the CEMP, and subsequently implemented, by the appointed contractor prior to construction, including Temporary Traffic Management arrangements prepared in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks'. The CTMP will be consulted upon with the road authority and will include measures to minimise the impacts associated with the Construction Phase upon the peak periods of the day. It will include imbedded mitigation measures which will assist to alleviate any negative impact as a result of the Construction Phase of the Proposed Scheme. The appointed contractor will also prepare a Construction Stage Mobility Management Plan (CSMMP) which will be developed prior to construction, as described in the CEMP, to actively encourage personnel to travel to site by sustainable means.

Chapter 5 (Construction) has been prepared to demonstrate the likely approach that will be taken to construct the Proposed Scheme, while it also provides an overview of the construction activities necessary to undertake the works, including information on a proposed Construction Compound, 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 which 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 will be prepared and included in the CEMP, and subsequently implemented, by the appointed contractor prior to construction, including Temporary Traffic Management arrangements prepared in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks'. The CTMP will be consulted upon with the road authority and will include measures to minimise the impacts associated with the Construction Phase upon the peak periods of the day. It will include imbedded mitigation measures which will assist to alleviate any negative impact as a result of the Construction Phase of the Proposed Scheme. The appointed contractor will also prepare 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 Scheme.

6.5.2 Operational Phase

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

The impacts to general traffic and parking / loading, including the mitigation measures incorporated into the Proposed Scheme have been outlined in Chapter 4 (Proposed Scheme Description) of this EIAR.

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

6.6 Residual Impacts

With the implementation of the imbedded mitigation measures designed into the Proposed Scheme, the residual impacts associated with the assessment topics outlined in Section 6.4 (Predicted Impacts) remain the same.

6.7 References

DCC (2016). Dublin City Development Plan

DCC and NTA (2016). Transport Study

DHLGH (2018). Project Ireland 2040 National Planning Framework

SDCC (2016). South Dublin County Development Plan

DPER (2015). Building on Recovery: Infrastructure and Capital Investment (2016-2021)

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Department of Transport (2021). Draft National Investment Framework for Transport in Ireland

DTTAS (2019). Design Manual for Urban Roads and Streets

DTTAS (2019). Statement of Strategy

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

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NAVTEQ (2011). The NavStreets Reference Manual

NTA (2011). National Cycle Manual

NTA (2013). Greater Dublin Area Cycle Network Plan

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

RSA (2019). Road Safety Strategy (2013-2020)

TRB (2000) Highway Capacity Manual

TRB (2013) Transit Capacity and Quality of Service Manual

Transport for London (2010) Traffic Modelling Guidelines