9 Traffic and Transport

Contents

Table of Abbreviations

Acronym	Meaning
AADT	Annual Average Daily Traffic
CSO	Central Statistics Office
DAA	Dublin Airport Authority
DANP	Dublin Airport North Portal
DASP	Dublin Airport South Portal
DART	Dublin Area Rapid Transit
DCC	Dublin City Council
DCU	Dublin City University
DMURS	Design Manual for Urban Roads and Streets
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ERM	East Regional Model
FCC	Fingal County Council
GDA	Greater Dublin Area
GIS	Geographic Information System
GTC	Ground Transportation Centre
HGV	Heavy Goods Vehicles
km	Kilometre
kph	Kilometre per Hour
JTC	Junction Turning Counts
LAP	Local Area Plan
LGV	Light Goods Vehicle
LILO	Left in Left out
LOS	Level of Service
NDC	North Dublin Corporate
NDP	National Development Plan
NTA	National Transport Authority
PAG	Project Appraisal Guidelines
PCL	Pedestrian Comfort Level
PCU	Passenger Car Unit
PED	Pedestrians
PT	Public Transport
SSG	St Stephen's Green (in summary tables only)
STMP	Scheme Traffic Management Plan
SWDR	Swords Western Distributor Road
SWRR	Swords Western Relief Road
TBM	Tunnel Boring Machine
TII	Transport Infrastructure Ireland
TTA	Traffic and Transport Assessment
TTM	Temporary Traffic Management

9. Traffic & Transport

9.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the impact of the MetroLink Project (hereafter referred to as the proposed Project), on Traffic and Transport during the Construction Phase and Operational Phase.

This Chapter describes and assesses the likely direct and indirect significant effects of the proposed Project on Traffic and Transport, in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (i.e. the EIA Directive) (European Union, 2014a).

This Chapter should be read in conjunction with the following Chapters, and their Appendices, which present related non-transport impacts arising from the proposed Project and proposed mitigation measures to ameliorate the predicted impacts:

- Chapter 10 (Human Health);
- Chapter 11 (Population & Land Use);
- Chapter 13 (Airborne Noise & Vibration);
- Chapter 16 (Air Quality); and
- Chapter 17 (Climate).

Limits of deviation have been set for the proposed Project and this is addressed in the Wider Effects Report which can be found in Appendix A5.19.

This Chapter should also be read in conjunction with the Scheme Traffic Management Plan (STMP, Appendix A9.5) and Traffic and Transport Assessments (TTAs, Appendix A9.2). A non-technical summary is also available in Volume 1 of the EIAR as well as in conjunction with Volume 4 of the EIAR, which contains the relevant Traffic and Transport Figures (mapping outputs) that are referenced throughout, where appropriate.

The assessment is based on a reasonable worst-case scenario with respect to potential impacts arising from the proposed Project as described in Chapters 4 to 6 of this EIAR. The proposed Project description is based on the design prepared to inform the planning stage of the project and to allow for a robust assessment as part of the Environmental Impact Assessment (EIA) Process.

Where it is required to make assumptions as the basis of the assessment presented here, these assumptions are based on advice from competent project designers and are clearly outlined within the Chapter.

9.2 Outline Project Description

A full description of the proposed Project is provided in the following Chapters of this EIAR:

- Chapter 4 (Description of the MetroLink Project);
- Chapter 5 (MetroLink Construction Phase); and
- Chapter 6 (MetroLink Operations & Maintenance).

Table 9.1 presents an outline description of the key proposed Project elements. Diagram 9.1 presents an outline of the main elements of the proposed Construction Phase, and Diagram 9.2 presents an outline of the main elements of the Operational Phase of the proposed Project.

Table 9.1: Outline Description of the Principal Project Elements

Project Elements	Outline Description
Permanent Project Elements	
Tunnels	It is proposed to construct two geographically separate, single-bore tunnels, using a Tunnel Boring Machine (TBM). Each section of tunnel will have an 8.5m inside diameter and will contain both northbound and southbound rail lines within the same tunnel. These tunnels will be located as follows: ▪ The Airport Tunnel: running south from Dublin Airport North Portal (DANP) under Dublin Airport and surfacing south of the airport at Dublin Airport South Portal (DASP) and will be approximately 2.3km in length; and ▪ The City Tunnel: running for 9.4km from Northwood Portal and terminating underground south of Charlemont Station.
Cut Sections	The northern section of the alignment is characterised by a shallow excavated alignment whereby the alignment runs below the existing ground level. Part of the cut sections are open at the top, with fences along the alignment for safety and security. While other sections are "cut and cover", whereby the alignment is covered.
Tunnel Portals	The openings at the end of the tunnel are referred to as portals. They are concrete and steel structures designed to provide the commencement or termination of a tunnelled section of route and provide a transition to adjacent lengths of the route which may be in retained structures or at the surface. There are three proposed portals, which are: ▪ DANP; ▪ DASP; and ▪ Northwood Portal. There will be no portal at the southern end of the proposed Project, as the southern termination and turnback would be underground.
Stations	There are three types of stations: surface stations, retained cut stations and underground stations: ▪ Estuary Station will be built at surface level, known as a 'surface station'; ▪ Seatown, Swords Central, Fosterstown Stations and the proposed Dardistown Station will be in retained cutting, known as 'retained cut stations'; and ▪ Dublin Airport Station and all 10 stations along the City Tunnel will be 'underground stations'.
Intervention Shaft	An intervention shaft will be required at Albert College Park to provide adequate emergency egress from the City Tunnel and to support tunnel ventilation. Following the European Standard for safety in railway tunnels TSI 1303/2014: Technical Specification for Interoperability relating to 'safety in railway tunnels' of the rail system of the European Union, it has been recommended that the maximum spacing between emergency exits is 1,000m. As the distance between Collins Avenue and Griffith Park is 1,494m, this intervention shaft is proposed to safely support evacuation/emergency service access in the event of an incident. This shaft will also function to provide ventilation to the tunnel. The shaft will require two 23m long connection tunnels extending from the shaft, connecting to the main tunnel. At other locations, emergency access will be incorporated into the stations and portals or intervention tunnels will be utilised at locations where there is no available space for a shaft to be constructed and located where required (see below).
Intervention Tunnels	In addition to the two main 'running' tunnels, there are three shorter, smaller diameter tunnels. These are the evacuation and ventilation tunnels (known as Intervention Tunnels): ▪ Airport Intervention Tunnels: parallel to the Airport Tunnel, there will also be two smaller diameter tunnels; on the west side, an evacuation tunnel running northwards from DASP for about 315m, and on the east side, a ventilation tunnel connected to the main tunnel and extending about 600m from DASP underneath Dublin Airport Lands. In the event of an incident in the main tunnel, the evacuation tunnel will enable passengers to walk out to a safe location outside the Dublin Airport Lands. ▪ Charlemont Intervention Tunnel: The City Tunnel will extend 360m south of Charlemont Station. A parallel evacuation and ventilation tunnel is required from the end of the City

Project Elements	Outline Description
	Tunnel back to Charlemont Station to support emergency evacuation of maintenance staff and ventilation for this section of tunnel.
Park and Ride Facility	The proposed Park and Ride Facility next to Estuary Station will include provision for up to 3,000 parking spaces.
Broadmeadow and Ward River Viaduct	A 260m long viaduct is proposed between Estuary and Seatown Stations, to cross the Broadmeadow and Ward Rivers and their floodplains.
Proposed Grid Connections	Grid connections will be provided via cable routes with the addition of new 110kV substations at DANP and Dardistown. (Approval for the proposed grid connections to be applied for separately but are assessed in the EIAR).
Dardistown Depot	A maintenance depot will be located at Dardistown. It will include: ▪ Vehicle stabling; ▪ Maintenance workshops and pits; ▪ Automatic vehicle wash facilities; ▪ A test track; ▪ Sanding system for rolling stock; ▪ The Operations Control Centre for the proposed Project; ▪ A substation; ▪ A mast; and ▪ Other staff facilities and a carpark.
Operations Control Centre	The main Operations Control Centre (OCC) will be located at Dardistown Depot and a back-up OCC will be provided at Estuary.
M50 Viaduct	A 100m long viaduct to carry the proposed Project across the M50 Motorway between the Dardistown Depot and Northwood Station.
Temporary Project Elements	
Construction Compounds	There will be 34 Construction Compounds including 20 main Construction Compounds, 14 Satellite Construction Compounds required during the Construction Phase of the proposed Project. The main Construction Compounds will be located at each of the proposed station locations, the portal locations and the Dardistown Depot Location (also covering the Dardistown Station) with satellite compounds located at other locations along the alignment. Outside of the Construction Compounds there will be works areas and sites associated with the construction of all elements of the proposed Project, including an easement strip along the surface sections.
Logistics Sites	The main logistics sites will be located at Estuary, near Pinnock Hill east of the R132 Swords Bypass and north of Saint Margaret's Road at the Northwood Compound. (These areas are included within the 14 Satellite Construction Compounds).
Tunnel Boring Machine Launch Site	There will be two main tunnel boring machine (TBM) launch sites. One will be located at DASP which will serve the TBM boring the Airport Tunnel and the second will be located at the Northwood Construction Compound which will serve the TBM boring the City Tunnel.

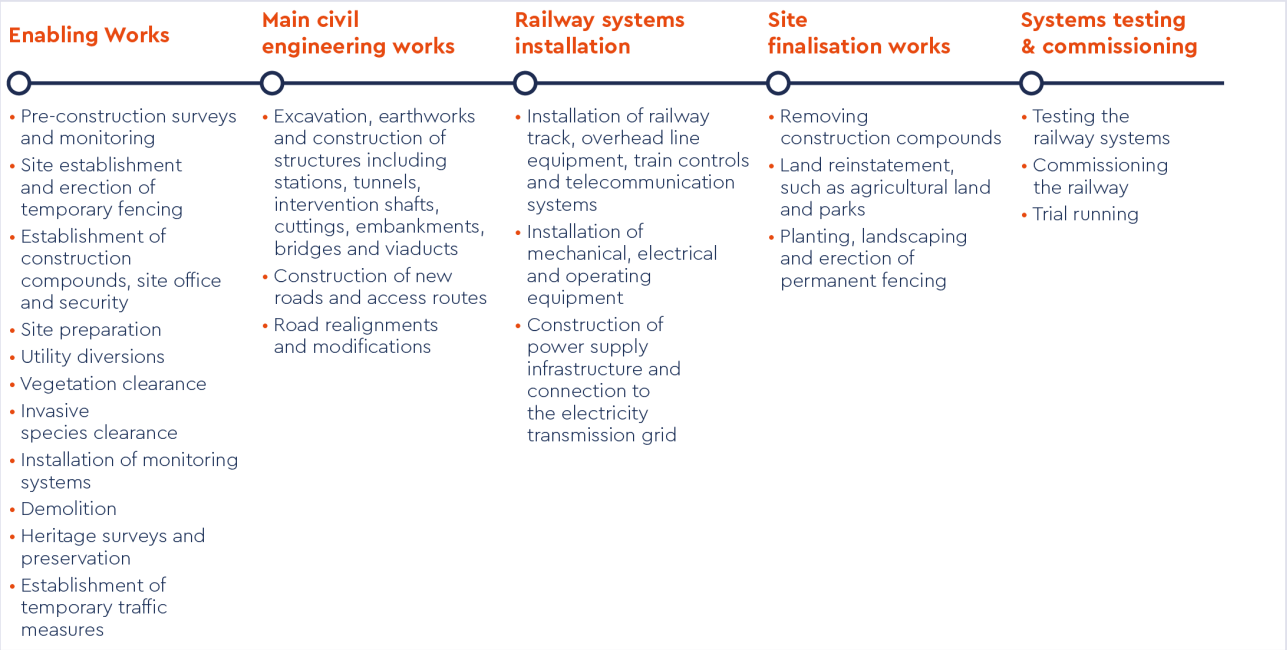

Diagram 9.1: Summary of Key Activities during the Construction Phase of the Proposed Project

Diagram 9.2: Summary of Key Activities during the Operation Phase of the Proposed Project

9.3 Chapter Structure

This Chapter provides a characterisation of the existing and future receiving environment within the proposed Project, and within a wider study area in the vicinity of the proposed Project. This Chapter also describes and assesses the likely direct and indirect significant effects of the proposed Project on Traffic and Transport. As such, the Chapter details the following:

- Methodology (including Study Area; Relevant Guidelines, Policy and Legislation; Data Collection and Collation; Analysis Methods; Consultations; Identification of Potential Effects; Difficulties Encountered in Compiling Information; and Appraisal Method for the Assessment of Impacts);
- Description of Baseline Environment in relation to Traffic and Transport (both at Strategic and Local Level, detailing the significance and sensitivity of receptors);
- Predicted Construction Impact on Traffic and Transport (both at Strategic and Local Level);
- Predicted Operational Impact on Traffic and Transport (both at Strategic and Operational Level);
- Proposed Mitigation Measures for both Construction and Operational Phases; and
- Predicted Residual Impacts during the Construction and Operational Phases.

9.4 Methodology

9.4.1 Study Area

The Traffic and Transport study area includes the areas affected by the construction and operation of the proposed Project over its full operational length from Estuary, north of Swords to Charlemont, south of Dublin City Centre. The proposed Project is presented and assessed in the EIAR based on four distinct geographical areas, as shown in Diagram 9.3.

- **AZ1 Northern Section**: Estuary Station to Dublin Airport North Portal (DANP). It includes the rail line crossing on viaduct over the Broadmeadow and Ward Rivers and associated flood plains. This section will include open retained cut and cut-and-cover sections. This section includes the proposed Park and Ride Facility at Estuary Station;
- **AZ2 Airport Section**: This section of the proposed Project includes DANP, the tunnel underneath Dublin Airport, Dublin Airport Station and Dublin Airport South Portal (DASP);
- **AZ3 Dardistown to Northwood**: From south of DASP to the Northwood Portal. This section includes the proposed Dardistown Depot, the M50 Viaduct and the construction compound at Northwood. This section will include open, retained cut and cut-and-cover sections; and
- **AZ4 Northwood to Charlemont**: From south of the Northwood Portal to the tunnel termination location south of Charlemont Station.

A summary of the stations within each geographical section can be found in Chapter 4 (Description of the MetroLink Project).

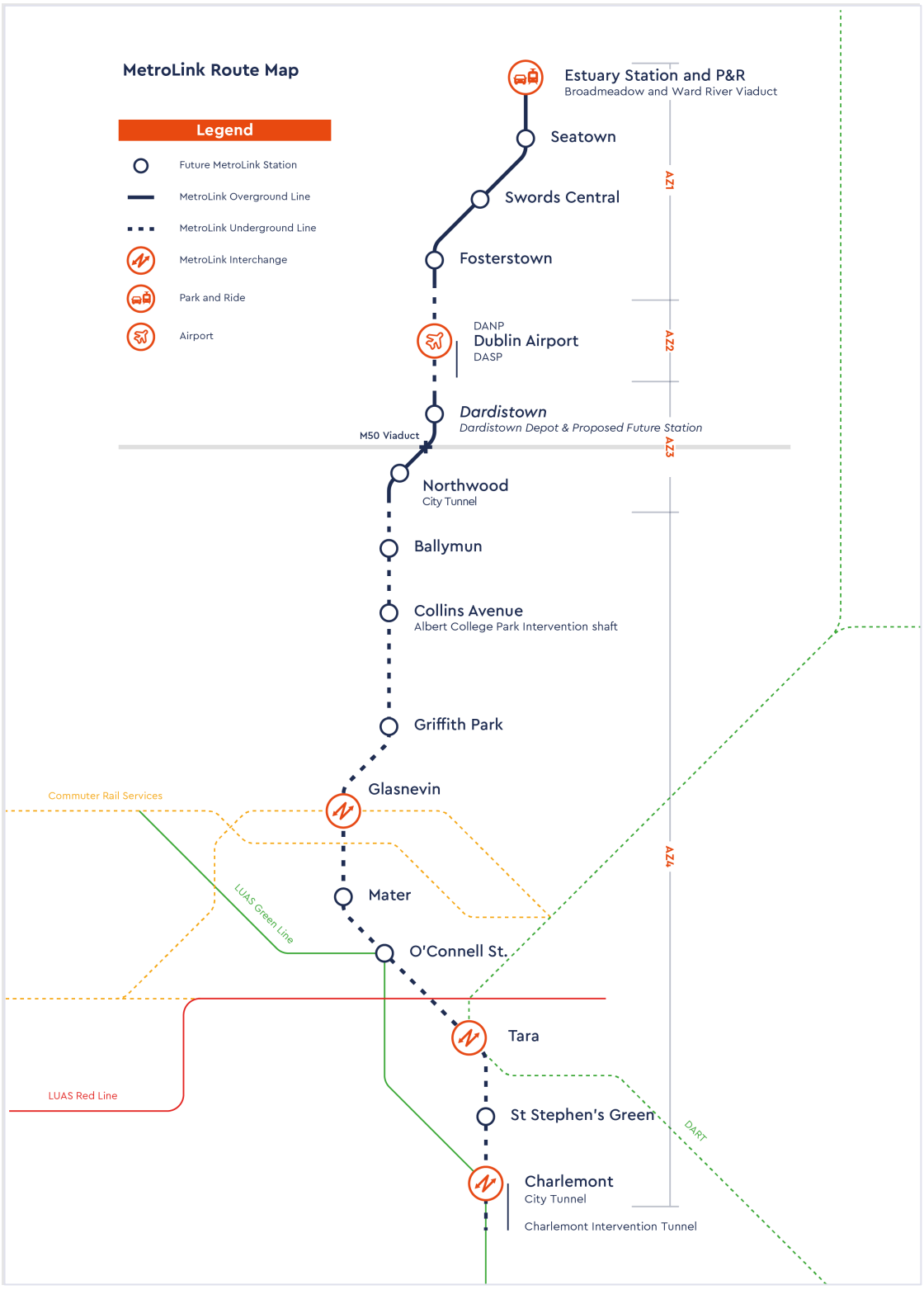

Diagram 9.3: Proposed Project Alignment and Geographical Sections

Furthermore, effects beyond the extent of the proposed Project will also be considered such as those resulting from haul routes used during the Construction Phase, impacts caused on traffic and transport networks during the Construction Phase and the impacts on traffic and transport networks during the Operational Phase. The assessment will also consider the cumulative impacts of interactions between other projects in the surrounding area, in the Operational Phase, as presented in Chapter 5 (MetroLink Construction Phase) and Chapter 30 (Cumulative Impacts of Interactions Between Other Projects and MetroLink), and through the modelled scenario which includes the key projects from the National Development Plan and Transport Strategy for the Greater Dublin Area (GDA) that are most likely to

impact transport movements. Further details on this model scenario are presented in Section 9.4.4.3 Operational Phase Analysis Methods

To determine the main area of influence, two baseline model runs have been carried out: one without the proposed Project, and one with the proposed Project in place. The public transport and highway outputs from these two runs have been compared to identify the area of influence of the proposed Project, and the results are provided in the 'Area of Influence' Technical Note (Appendix A9.1). The results indicate that there is an increase in traffic volumes to the north of the alignment (north of the Park and Ride Facility) when the proposed Project is in place, with a subsequent reduction in road traffic between Swords and Dublin City Centre. Changes in car trips also occurred on arterial routes around Dublin City Centre. Figure 9.1 displays the Project's area of influence. Given the proximity of the proposed Project to the counties in the north of Leinster and the access to the proposed Park and Ride, the area of influence extends north of the Park and Ride Facility. The area of influence also extends to the West and South of Dublin along major radial corridors, and the M50 Motorway due to opportunities to combine Luas Green Line trips with proposed Project and access the Kildare and Maynooth railway stations.

9.4.2 Relevant Guidelines, Policy and Legislation

This section provides an outline of the relevant National, Regional and Local land-use and transport planning policy which sets out the context for the proposed Project. Further details on the planning and policy context of the proposed Project can be found in the Planning Policy Report and Overall Traffic and Transport Assessment (TTA, Appendix A9.2).

Table 9.2: Relevant Guidelines and Policy

National Level	
Policy	**Guidance**
National Planning Framework (DHPCLG 2018)	Traffic and Transport Assessment Guidelines (TII 2014)
National Development Plan 2021-2030 (DPER 2021)	Urban Design Manual: A Best Practice Guide (DHLGH 2009)
National Sustainable Mobility Policy (Department of Transport, 2022)	Design Manual for Urban Roads and Streets (Government of Ireland 2019)
National Investment Framework for Transport Ireland (DoT, 2021)	
Climate Action Plan 2021	
The Energy White Paper: Ireland's Transition to a Low Carbon Energy Future 2015-2030 (DCCAE 2015)	
National Cycling Policy Framework 2009-2020	
Regional Level	
Policy	**Guidance**
Regional Spatial and Economic Strategy for the Eastern and Midland Region 2019-2031 (EMRA 2018)	Greater Dublin Area Cycle Network Plan (NTA 2013)
Transport Strategy for the Greater Dublin Area 2016-2035 (NTA 2016)	Draft Greater Dublin Area Cycle Network Plan (NTA, 2021)
Draft Transport Strategy for the Greater Dublin Area 2022-2042 (NTA, 2022)	
Park and Ride Strategy Report (NTA, 2021)	

Local Level	
Policy	**Guidance**
Dublin City Development Plan 2016-2022 (DCC 2016a)	Dublin Airport Central Masterplan (FCC 2016)
Draft Dublin City Development Plan 2022-2028 (DCC, 2021)	Dublin Airport Local Area Plan (LAP) (FCC 2019c)
Local Level	
Policy	**Guidance**
Fingal Development Plan 2017-2023 (FCC 2017a)	Grangegorman Strategic Development Zone Planning Scheme (DCC 2012a)
Draft Fingal Development Plan 2023-2029 (FCC, 2022)	Dardistown LAP (FCC 2013)
Swords Masterplan (FCC 2019a)	Ballymun LAP (DCC 2017)
South Fingal Transport Study (FCC 2019b)	Barrysparks LAP (FCC 2017b)
Your Swords: An Emerging City, Strategic Vision 2035 (FCC 2008)	Fosterstown LAP (FCC 2010)
	Oldtown/Mooretown LAP (FCC, 2010)
	George's Quay LAP (DCC 2012c)
	Dublin City Local Economic and Community Plan 2016-2021 (DCC 2016b)
	The Heart of Dublin - City Centre Public Realm Masterplan (DCC 2016c)

9.4.3 Data Collection and Collation

9.4.3.1 Regional Modelling System

The National Transport Authority's (NTA) East Regional Model (ERM) has been utilised to provide the majority of the input transport data for the assessment of the proposed Project. The ERM provides a multi-modal forecasting capability required for the assessment of large-scale projects. It includes full geographic coverage of the eastern region (counties Dublin, Wicklow, Kildare, Meath, Louth, Wexford, Carlow, Laois, Offaly, Westmeath, Longford, Cavan and Monaghan), a detailed representation of the road network, a detailed representation of the public transport network and services, a detailed representation of all major transport modes including active modes, accurate mode choice modelling of residents, a detailed representation of travel demand of four time periods (AM- morning peak, 07:00-10:00, LT-lunchtime, 10:00-13:00, SR-school run, 13:00-16:00, and PM, evening peak, 16:00-19:00) and a prediction of changes in trip destination in response to changing traffic conditions, transport provision and/or policy. The ERM has been used to provide forecast transport movements, such as passenger numbers, origin/destination and changes in travel behaviour due to the proposed Project. The ERM was calibrated by the NTA to a base census year of 2016, full details on the data collection used in the development of the model and in the validation and calibration of the model is contained within the Model Development Reports – East Regional Model (NTA 2020).

The Transport Modelling Plan (Appendix A9.3) and Transport Modelling Report (Appendix A9.4) should be referred to for further information on the ERM model runs.

9.4.3.2 Planning Datasheets

The NTA have provided Planning Datasheets for the years 2035, 2050 and 2065, that includes forecasts for key trip generation and destination variables such as:

- Population;
- Population by age cohorts;
- Population by school level (Primary, Secondary, Third Level);
- Principal Economic Status;

- Employment places at destination;
- Employment paces at destination by type (Health, Retail, Food Retail); and
- Education places at destination by level (Primary, Secondary, Third Level).

These planning sheets are the principal land use scenario for all plans and schemes. Interim year planning sheets for years between 2016 and 2040, are straight line interpolation between 2016 and 2040. For years after 2040, these planning datasheets are created by extending this straight-line interpolation onwards to the forecast year, such as 2050 or 2065.

Further details on the Planning Datasheets can be found in Chapter 11 (Population & Land Use).

9.4.3.3 Specific Developments

In addition to the forecast growth associated with the typical land use patterns, Dublin Airport is a key growth driver in the corridor and has a different growth associated with flight travel demand. Within the ERM, growth in landside demand is determined for passengers, staff and freight, applied to the Dublin Airport Special Zone. Freight and staff numbers are forecasted on a scaling factor, which are aligned with passenger growth forecasts.

The passenger growth forecasts are based on the central growth forecast from the Department of Transport, Tourism and Sport (DTTAS) report "Review of Capacity Needs at Ireland's State Airports - August 2018", and the Central Statistics Office (CSO) 2016-2019 Aviation Stats' TAM05. The CSO statistics are used to calculate the growth rate up to 2019 and the growth rate from 2020 to 2050 is determine by interpolation from the 2019 passenger forecast to the 2050 passenger forecast contained within the DTTAS report. We have assumed that the growth rate from 2050 will continue until the 2065 forecast year.

9.4.3.4 Data Collection

The following qualitative data has been collected and utilised in the assessment:

- Ordnance Surveys;
- Google Street View; and
- Existing and Proposed Street Level Layout Drawings for visual identification of infrastructure.

The following quantitative data has been collected and utilised in the assessment:

- Commissioned Traffic Surveys (Junction Turning Counts and Pedestrian Counts);
- Topographical surveys;
- TII Traffic Counters;
- Existing and Proposed Street Level Layout Drawings for measurement purposes; and,
- Forecast vehicle flows and pedestrian movements from Dublin Airport Authority (DAA).

For local assessments along the alignment, traffic count surveys and pedestrian count surveys were undertaken to inform local junction models and micro-simulation models, and to complement existing traffic data in the vicinity of the proposed Project alignment. The collected data facilitated the assessment of the potential traffic impacts associated with the construction process and proposed temporary diversions to vehicle and pedestrian traffic. A total of 108 locations were surveyed over a 24-hour period on a mid-weekday (Tuesday, Wednesday or Thursday).

A full overview of the qualitative and quantitative data collection methods used can be found in the Data Collection Report (Appendix A9.6).

9.4.4 Analysis Methods

9.4.4.1 Overview

This section details the methods that have been used to analyse the potential traffic and transport impacts of the proposed Project during both the Construction and Operational Phases, in line with the 'Traffic and Transport Assessment Guidelines' (TII, 2014).

The analysis methods have examined the changes in transport movements for all mode users with the proposed Project in place:

- Public Transport (PT) Users;
- Road Users;
- Pedestrians;
- Cyclists; and
- Parking and Loading.

9.4.4.2 Operational Phase Analysis Methods

As detailed in section 9.4.3. Data Collection and Collation, the NTA's ERM has been utilised to obtain data on the strategic transport movements within the GDA. The ERM provides a detailed representation of all major transport modes including the public transport network, road network and active modes networks, accurate mode choice modelling of residents, a detailed representation of travel demand of four time periods (AM, LT, SR and PM) and a prediction of changes in trip destination in response to changing traffic conditions, transport provision and/or policy.

The assessments for the Operational Phase have been carried out using the following scenarios, as presented in Table 9.3:

- Scenario A – Do Committed Minimum (see section 9.4.4.2.1)
  - 'Do Minimum' (2035, 2050, 2065)
  - 'Do Something (2035, 2050, 2065)
- Scenario B – Likely Future (see section 9.4.4.2.2)
  - 'Do National Development Plan (Do NDP)' (Do Minimum and Do Something 2035)
  - 'Do Greater Dublin Area Transport Strategy (Do GDA)' (Do Minimum and Do Something 2050, 2065).

Table 9.3: Modelled Transport Scenarios in Operational Phase

Scenario	Description
Do Minimum-Scenario A	Committed transport schemes in the absence of the Project
Do Something - Scenario A	Scenario with the Project and committed transport schemes only.
Do Minimum-Scenario B	Scenario with planned schemes under the NDP for delivery by 2035 for Opening Year (2035) and planned schemes under the Transport Strategy for the GDA for the Design Year (2050) and the Forecast Year (2065), in the absence of the Project
Do Something - Scenario B	Scenario with the Project with planned schemes under the NDP for delivery by 2035 for Opening Year (2035) and planned schemes under the Transport Strategy for the GDA for the Design Year (2050) and the Forecast Year (2065)

9.4.4.2.1 Do Minimum (Committed) Scenario (Scenario A)

Transport Infrastructure Ireland's (TII) Project Appraisal Guidelines for National Roads Unit 4.0 – Consideration of Alternatives and Options PE-PAG-02013 (PAG) (TII, 2016) states the following in relation to the Do Minimum: *"The Do Minimum option provides the baseline for the establishing the economic, integration, safety, environmental and accessibility impacts of all options"*. As such, ensuring an

appropriate Do Minimum scenario is essential to the robust appraisal of the proposed Project. *"The Do Minimum option should include those transportation facilities and services that are committed within the appraisal period"*. As such, all schemes which are considered to be committed have been included in the Do Minimum Scenario. Committed schemes included in this scenario include, but are not limited to:

- Luas Green Line Capacity Enhancement – Phase 1;
- BusConnects Dublin Area Bus Network Redesign; and,
- BusConnects Fares and Ticketing.

More information on the Do Minimum Scenario is available in the Transport Modelling Plan (Appendix A9.3).

The Project Appraisal Guidelines (PAG) also makes a clear distinction between Committed and Planned Schemes:

"(a) "Planned" improvements that are included in the fiscally constrained long-range plan for which the need, commitment, financing, and public and political support are identified and may be reasonably expected to be implemented; and

(b) "Committed" improvements that have been progressed through planning and are either under construction or are programmed into the capital expenditure budget.

The Do Minimum option should consider "committed" schemes alone as the inclusion of "planned" improvements may lead to a set of scheme options that incorporate projects that may not happen."

9.4.4.2.2 Do Minimum (Likely Future) Scenario (Scenario B)

This scenario represents the likely future receiving environment and is based on the delivery of the schemes identified within the NDP for 2035 and based on the implementation of the NTA's GDA Transport Strategy (2016-2035) for 2050 and 2065. As such, this model scenario considers the cumulative impacts of interactions between other projects that are most likely to impact on transport movements in the area Schemes included in this scenario are, but are not limited to:

- Luas Green Line Capacity Enhancement - Phase 2;
- Luas Finglas;
- Luas Lucan;
- BusConnects Core Bus Corridors (planned 16 corridors); and
- DART Expansion.

9.4.4.2.3 Do Something Scenario(s)

These scenarios include the provision of the proposed Project, it is simply the Do Minimum scenarios in addition to the operation of the proposed Project. Assumptions for the strategic modelling are detailed in Table 9.4, such as service pattern, headways, fares, capacity (vehicle), crowding curve and waiting curve, or boarding and transfer penalties. The headway values have been utilised in both Scenario A and Scenario B. A 90second headway has been utilised to accommodate the anticipated 20,000 per hour capacity, as stated in Chapter 6 (MetroLink Operations and Maintenance).

Table 9.4: Modelling Parameters

Assumptions	2035	2050	2065
Service Pattern	Estuary-Charlemont	Estuary-Charlemont	Estuary-Charlemont
Headways	2min	2min	90seconds
Fares	Integrated ticketing (as used for BusConnects).	Same	Same
Capacity (/Vehicle)	125 seat/500 crush	Same	Same

Assumptions	2035	2050	2065
Crowding Curve	As ERM standard crowding curve for Luas	Same	Same
Waiting Curve/Boarding Penalties/Transfer Penalties	As standard RMS/ERM curve & penalties These are: 10min board penalty all modes 15min transfer penalty to/from rail 15min transfer penalty Dublin Bus to Dublin Bus Otherwise, 5min transfer penalty.	Same	Same

Where required, local area models were developed to analyse the localised transport movements at each of the stations. The proposed Project's proposed street level layouts were used to identify changes in infrastructure at each of the stations, such as the provision of cycle lanes or pedestrian crossings. Spreadsheet models and industry standard software packages such as VisWalk microsimulation models, LinSig junction models and the Transport for London's (TfL) Pedestrian Comfort Calculator were used to analyse local impacts.

9.4.4.3 Construction Phase Analysis Methods

The following methods have been utilized to analyse the impact of the Construction Phase on the transport network:

- Review of proposed street level layouts of the Temporary Traffic Management (TTM) measures to identify lane closures, impacts to the cycle and walking networks, reduction in parking;
- Strategic Modelling – This has been used to assess the impact on the regional transport network, the tools utilise the highway model of the NTA's ERM and allow the reassignment of traffic onto other road links depending on travel times and delays that drivers may experience;
- Local Modelling – This uses static demand, i.e., the demand doesn't reassign, and is used to understand the impact on individual junctions or a group of junctions. The Local modelling uses industry standard tools, such as LinSig and Junctions 9; and
- Development of a Strategic/Local Impact Assessment and Rating Methodology as part of the STMP (Appendix A9.5).

The STMP (Appendix A9.5) has been developed with a planned Construction Phase lasting approximately 9 years. To identify the worst-case scenario construction vehicles throughout the Construction Phase, data on projected vehicle numbers was analysed. The average of construction vehicles was calculated from each calendar month, for each site. By summing across sites, the maximum flow months were identified for both sites north of the M50 Motorway and sites within the M50 Motorway, thus identifying "worst case" scenarios. It was identified that 2028 will represent the peak Construction Year. For the assignment of these construction vehicles to the network some further assumptions were made.

- It was assumed that 90% of all spoil went to Huntstown Quarry;
- The remaining 10% was assumed to go Portlaoise, on the assumption that this was contaminated spoil which would be dealt with by a contractor there;
- Precast was assumed to go to a contractor in Co. Offaly (outside the modelled area) via the M4 Corridor;
- Concrete was assumed to go to/from the nearest of the identified concrete batching sites to the construction site in question; and
- Other construction vehicles were assumed to come to/from the same site as the concrete vehicles. This assumption was necessary given the relatively low numbers of these vehicles.

A 2028 Do Minimum scenario has been utilised as the baseline for the construction impact assessment. This time period represents a worst-case scenario for the volume of generated construction traffic, with traffic management measures in place at most stations and busiest period for movement of construction vehicles. The TTM measures in place during both the Enabling Works and Main Works, such as lane closures, and proposed haul routes have been coded into the highways model and the construction traffic has been added to the fixed demand SATURN road model to create a 2028 Do Construction model.

In the Do Minimum model, the network consisted of a 2028 base network with the addition of two further committed schemes; the inclusion of the measures proposed within the R132 Connectivity Project (Planning Application Number – JP06F.310145) and the proposed BusConnects infrastructure designs. These junctions, at all of which roundabout have been replaced by signalised junctions, are:

- The Northern Swords R125-R132 (Estuary Roundabout);
- Seatown Roundabout R132; and,
- Malahide Roundabout (R106 Drynam Road/R132).

The following where junction where a roundabout will be replaced by a signalised junction, is part of the proposed BusConnects project:

- Pinnock Hill Roundabout (R836/R125/R132).

The network updates included as part of BusConnects design are:

- Bus gate included on St Mobhi Road; and,
- Operation changes around Blackhall Palace.

For the analysis of the Enabling Works a 2024 Do Minimum model was used, which utilised a 2024 demand from the ERM model. This model includes the R132 Connectivity Project committed scheme only. It was considered that the Enabling Works will take place over a range of time and therefore the 2024 model accurately captures the impacts in a 'pre-BusConnects' scenario.

9.4.5 Consultations

Chapter 8 (Consultation) details the stakeholder and public consultation undertaken to inform the development of the proposed Project. Table 9.5 contains extracts from the Preferred Route Consultation Report, the full report of which can be found in Appendix A8.11 of Chapter 8 (Consultation).

Table 9.5: Principal Traffic and Transport Issues Raised During Consultation

Consultee	Phase/Date of Consultation	Issues Raised	Relevant Section of the EIAR
The Board of Management at Scoil Mobhí	**Preferred Route Consultation March 2019-May2019**	'In order for the school to operate during the Construction Phase, a separate pedestrian and vehicular access to the school (fully segregated from construction traffic) will need to be provided	**9.6.1.2.4. AZ4 Northwood to Charlemont Section**
Not specified	**Preferred Route Consultation March 2019-May2019**	Query whether Berkeley Road would be closed to traffic during construction of Mater Station	**9.6.1.2.4. AZ4 Northwood to Charlemont Section**
Not specified	**Preferred Route Consultation March 2019-May2019**	'The traffic disruption due to the proposed location of the St Stephen's Green Station will have a sustained and highly disruptive impact on traffic and movement in the general area, both during and after the Construction Phase'.	**9.6.1.2.4. AZ4 Northwood to Charlemont Section**
Local Residents	**Preferred Route Consultation March 2019-**	Concern over closure of Dartmouth Road	**9.6.1.2.4. AZ4 Northwood to Charlemont Section**

Consultee	Phase/Date of Consultation	Issues Raised	Relevant Section of the EIAR
	May2019		
Health Service Executive (HSE)	**Preferred Route Consultation March 2019-May2019**	Concerns in relation to the traffic management impact of the Preferred Route on ambulance response time. Request for study to assess the implication during both Construction and Operational Phase	**9.6.1.2.1 AZ1 Northern Section**
Not specified	**Preferred Route Consultation March 2019-May2019**	Traffic congestion along the R132 – 'bottleneck effect coupled with the chaotic three lane roundabout and MetroLink running across it will exacerbate the situation'	**9.6.1.2.1 AZ1 Northern Section**
Not specified	**Preferred Route Consultation March 2019-May2019**	Question how the entrances to Glasnevin Station will work with an already congested junction	**9.6.1.2.4. AZ4 Northwood to Charlemont Section**
Dublin Cycle Campaign	**Preferred Route Consultation March 2019-May2019**	'Secure, high density bike parking required at each station'	**9.6.2.2.X.4 Cycle Operational Impact**
Woodies DIY	**Preferred Route Consultation March 2019-May2019**	Concern over loss of customer parking at their store	**9.6.1.2.1 AZ1 Northern Section**
Ballymun Residents Area Association	**Preferred Route Consultation March 2019-May2019**	Concerns of illegal parking activity in the Albert College housing estate and along Ballymun Road	**9.6.1.2.4. AZ4 Northwood to Charlemont Section**
Not specified	**Preferred Route Consultation March 2019-May2019**	Query whether 'the number of spaces is necessary, and will it divert traffic off the M1 or will it just induce more private cars from North County Dublin'	**9.6.2.1.1 Park and Ride**
Not specified	**Preferred Route Consultation March 2019-May2019**	'Public walkways around all the stations should be comfortable and as generous to pedestrians as possible'.	**9.6.2.2.X.3 Pedestrian Operational Impact**
Fingal County Council	**Preferred Route Consultation March 2019-May2019**	'Along the R132 'pedestrian and cycling facilities along the entire corridor need to be fully considered	**9.6.1.2.1 AZ1 Northern Section**
Irish Airline Pilots Association	**Preferred Route Consultation March 2019-May2019**	'Pedestrian Access to and from the MetroLink shall not restrict or thwart surface vehicular drop-off transport flows from entering the airport'.	**9.6.1.2.2 AZ2 Airport Section**

9.4.6 Identification of Potential Effects

This section details how the potential effects were identified, to ensure any likely significant effects have not been missed in the further assessment.

9.4.6.1 Operational Phase

To identify the potential effects of the proposed Project in general terms, the results of the Do Minimum scenarios (i.e., the modelled scenarios without the Project), and the results of the Do Something scenarios (i.e. the modelled scenarios including the Project), were compared.

- **Comparison of Model Results** – the results of the Do Minimum scenarios (i.e., the modelled scenarios without the Project), and the results of the Do Something scenarios (i.e. the modelled scenarios including the Project), were compared. In addition, local junction model results have also been compared to baseline results to identify effects on general traffic at individual or grouped junctions.
- **Measurements** – Measurements, such as footpath widths, have been taken from the proposed street level layout drawings. These have been compared to the baseline measurements to identify the changes. These measurements have then been utilised within tools such as the National Cycle Manual's quality of service calculator, and TfL's Pedestrian Comfort guidance, to identify the effects of changes.

The assessment of the proposed Project in relation to the baseline and Do Minimum transport environment requires a qualitative assessment of changes to the receiving environment, as well as quantifying changes through the percentage change from the baseline for considerations for all metrics. VisWalk microsimulation pedestrian models were developed for the Do Something scenarios only, and therefore were not compared to the Do Minimum scenarios. Static assessment of the baseline scenario has been undertaken, as well as in the Operational Phase with comparisons drawn between the two scenarios, however certain locations required further analysis and as such Do Something VisWalk models were developed.

These potential effects were then assessed utilising the methodology outlined in Section 9.4.8 Appraisal Methods for the Assessment of Impacts.

9.4.6.2 Construction Phase

To identify the potential effects the following processes have been used:

- **Comparison of Model Results** – For assessment of the Enabling Works, the results from the Do Minimum 2024 have been compared to the Do Construction models to identify the changes in vehicle flows and increases in HGV traffic on the highways network and changes in journey times for general traffic and public transport (bus). In addition, local junction model results have also been compared to baseline results to identify effects at individual or grouped junctions. For the Main Works, a Do Minimum 2028 model has been used in the same way.
- **Measurements** – Measurements, such as footpath widths, have been taken from the TTM drawings. These have been compared to the baseline measurements to identify the changes. These measurements have then been utilised within tools such as the National Cycle Manual's quality of service calculator to identify effects of changes.

9.4.7 Difficulties Encountered in Compiling Information

The traffic and transport data that has been used in the modelling works was gathered in 2018, prior to the series of COVID-19 lockdowns. Due to the ongoing COVID-19 pandemic, the ability to collect new information since March 2020 has been limited, as surveys in this period would not be representative of typical transport conditions.

When analysing the model data outputs in relation to impacts of the Park and Ride Facility, it was evident that the Park and Ride module within the ERM did not constrain the capacity of the facility, such as, with increasing demand on the Park and Ride, the capacity also increased. To correct this, the modelling team were able to add a capacity constraint to the module so ensure that the capacity did not exceed 3,000 spaces in order to ensure accurate results were assessed.

In developing the appraisal methods for the assessment of impacts, it is necessary to identify appropriate performance indicators for determining the magnitude of an impact. Therefore, professional judgement was utilised in many cases to categorise the magnitude of impacts, such as when a percentage increase is considered high or low. These performance indicators are based on well-informed and acceptable measures of performance based on the operating environment in Dublin, and have been presented to key stakeholders, such as Fingal County Council (FCC) and Dublin City Council (DCC) throughout the assessment process.

The STMP (Appendix A9.5), which develops the construction impacts at a local level in more detail, is based on a Construction Programme, Preliminary Design, Strategic Model and Local model outputs, including all planned road closures. This is also supported by bespoke traffic management designs for each of the individual construction sites. The STMP develops its own rating system for determining the magnitude and severity of impacts on all road users, as presented in Section 9.4.8.2.2 Construction Phase.

The assessment approach in this EIAR chapter differs from the STMP in terms of consideration being given to the sensitivity of the receiving environment, in conjunction with the magnitude of the impact, in determining the significance of the impact. The STMP methodology assesses only the magnitude of traffic and transport impacts of the Project on all road users and does not take into account the significance and sensitivity of the receptor. Therefore, when the significance and sensitivity of the receptor is identified in this EIAR assessment, the STMP impact ratings do not always correspond to those in this chapter. The STMP has informed this Traffic and Transport construction assessment, and where outputs from the STMP are used in this chapter they are referenced appropriately.

9.4.8 Appraisal Methods for the Assessment of Impacts

This section details the appraisal methods that have been used to assess the impacts of the proposed Project, during both Operation and Construction Phases. The assessments have been carried out as follows:

- Outlining the user class affected;
- Defining the Sensitivity of the Environment;
- Determining the Predicted Magnitude of Impacts;
- Determining the Predicted Duration of the Impact; and
- Determining the Significance of Effects.

9.4.8.1 Determining the Sensitivity

Firstly, the sensitivity of the area affected by the impact was considered. The Design Manual for Urban Roads and Streets (DMURS) (Government of Ireland 2019) details the distinction between the 'Movement Function' and the 'Place Context' within the street network, which contribute to its overall significance and level of sensitivity. DMURS applies to all urban roads with a speed limit of less than 60kph, which applies to the majority of the streets within the Study Area.

DMURS, refers to the following street hierarchy to classify the movement function of a road or street:

- Arterial Streets (such as National Roads, or Primary Distributor Roads);
- Link Streets (such as Regional Roads, or District Distributor Local Collector Roads); and
- Local Streets (such as Local Roads, or Access Roads).

However, there is a recognition that the classification led approach does not consider the element of 'Place Context'. DMURS recognises that 'urban roads and streets can traverse many areas with very different characteristics, such as industrial areas, residential areas, mixed use neighbourhoods and city, town and village centres.' As such, varying contexts have varying levels of sensitivity. The guide classifies 'Place Context' in the following way from highest to lowest place value:

- Centre (areas that are the focus of economic and cultural activity);
- Neighbourhood (areas intensively developed with medium to higher density housing and/or contain a broad mix of uses);
- Suburb (predominantly consist of existing lower density housing developed over expansive areas); and
- Business Park/Industrial Estate (areas primarily focused on providing areas of commercial and industrial activity outside of Centres).

This identification of 'place context' has been used to assign significance and sensitivity ratings to the pedestrian and cycling networks, as the alignment traverses through rural, suburban and urban areas

within Dublin. As such, the volumes of pedestrians and cyclists using the infrastructure will vary along the alignment, and the sensitivity of the infrastructure to absorb changes in flows when the proposed Project is in place will also vary along the alignment. As such, the classification is based on a mix of DMURS guidance and professional judgement.

The significance and sensitivity of the public bus transport network has been categorised based on the Bus Network Redesign proposals as part of the BusConnects programme. The significance is based on the movement function of the service, such as its capacity levels and frequency of service, as identified through the BusConnects proposed frequencies (available at www.busconnects.ie, accessed 21st March 2022). For other public transport networks such as Luas and DART services, frequencies were obtained from www.luas.ie, and www.irishrail.ie. The sensitivity is based on the impact of the service if faced with delays and is therefore based on professional judgement.

Table 9.6 details the significance of road and place types based on their 'movement function' or strategic importance and ability to facilitate traffic volumes, and the sensitivity of the receptor when given a change in traffic volume, for any mode. The sensitivity of the receptor to changed is based on its 'place context value', i.e. the consideration of local factors, as identified in DMURS, and the receptors ability to absorb changes. Using DMURS' identified hierarchy of movement and place context, as well as professional judgement on the significance and sensitivity of the public transport network services, ratings of 'low' to 'high' have been applied to both the significance and sensitivity of the road network, pedestrian and cycle networks, and public transport services. The overall sensitivity of networks in the baseline environment will be determined by a combination of these elements.

Table 9.6: Road and Place Type Categorisation of Sensitivity

Road Types (Vehicle Impact)	Significance of Type /Route	Sensitivity of receptor to change in traffic flow (General)	Comment
Local (Local Roads)	Low	High	E.g., Local road does not move a high volume of traffic, however presence of a school would make it very sensitive to change
Link (Regional Roads)	Medium	Medium	
Arterial (National Roads)	High	Low	
Motorway	Very High	Low	E.g., Motorway is part of strategic road network and moves a high volume of people, however it generally does not have sensitive receptors nearby
Place Types (Pedestrian/Cyclist)	**Significance of Type/Route**	**Sensitivity of receptor to change in volume and quality of service (General)**	**Comment**
City Centre	Very High	High	City Centre would have a high volume of pedestrians and cyclists for short

			distance trips, and would be very sensitive to changes in infrastructure
Town Centre	High	High	
Suburb	Medium	Medium	
Industrial Estate	Low	Low	An Industrial estate would have minimal volumes of pedestrians and cyclists as they are often isolated in location, would not be sensitive to changes in infrastructure
Public Transport Routes (as per Bus Network Redesign)	**Significance of Type/ Route**	**Sensitivity of receptor to change in volume and quality of service (General)**	**Comment**
Core Bus Corridors, Spine, Orbital and Express Routes	Very High	High	High frequency and high-capacity routes would be very sensitive to any delays on network
Other City Bound Routes	High	Medium	
Local Routes	Medium	Low	
Peak Only Routes	Low	Negligible	Low frequency routes serving few passengers would be less sensitive to delays on the network
Other Public Transport Services	**Significance of Type /Route**	**Sensitivity of receptor to change in volume and quality of service (General)**	**Comment**
Luas (Light Rail)	Very High	High	High frequency/ high- capacity service
DART or heavy rail	Very High	Very High	Interchange with heavy rail network to travel across Ireland

It is recognised that the magnitude of the effects is dependent on the sensitivity of the location and thus each location is assessed with reference to the sensitivity of the location.

Once the significance and sensitivity of the receptor was identified, the magnitude of each impact was determined by identifying the degree of change between scenarios with and without the proposed

Project in place. The following indicators have been utilised to determine the magnitude of the impact on the respective user.

9.4.8.2 Determining the Magnitude

9.4.8.2.1 Operational Phase

9.4.8.2.1.1 All Modes

The impact of the proposed Project on mode shift has been assessed across all modes: Walking, Cycling, Public Transport (both with and without the proposed Project), and Road. Table 9.7 presents the magnitude gradings associated with the change in mode share per mode, based on the percentage difference between the Do Minimum and Do Something scenarios.

Table 9.7: Change in Mode Share Magnitude Gradings

User Group	Effect/Impact	Change in Mode Share between Do Minimum and Do Something Scenarios			
All Users	Sensitivity of Area	+/- 1% from baseline	+/- 1% to 10% from baseline	+/- 10% to 20% from baseline	+/- >20% from baseline
	Negligible	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Low	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Medium	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	High	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Very High	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact

9.4.8.2.1.2 Pedestrians

The sensitivity and significance of the pedestrian network has been informed by DMURS (Government of Ireland 2019) classification of 'Place Context Value' for locations in the city centre, town centre, suburbs and industrial estates, as identified in Table 9.6. DCC also identify Strategic Pedestrian Routes within Dublin City Centre (DCC 2016a), as shown in Diagram 9.4. The Draft Fingal Development Plan 2023-2029 recognises the need to 'provide for a comprehensive network of pedestrian and cycle ways linking residential areas to one another, to the town centre [and] schools'. In addition to the provision of high-quality active travel infrastructure, 'an important measure of successful mobility is also dependent on quality of experience trough quality public realm, accessibility, permeability and legibility'. Fingal has the potential to develop an extensive network of strategic Greenway routes for walking and cycling to become attractive components of Fingal's integrated transport network, however at present there are no other classifications of pedestrian routes within the area.

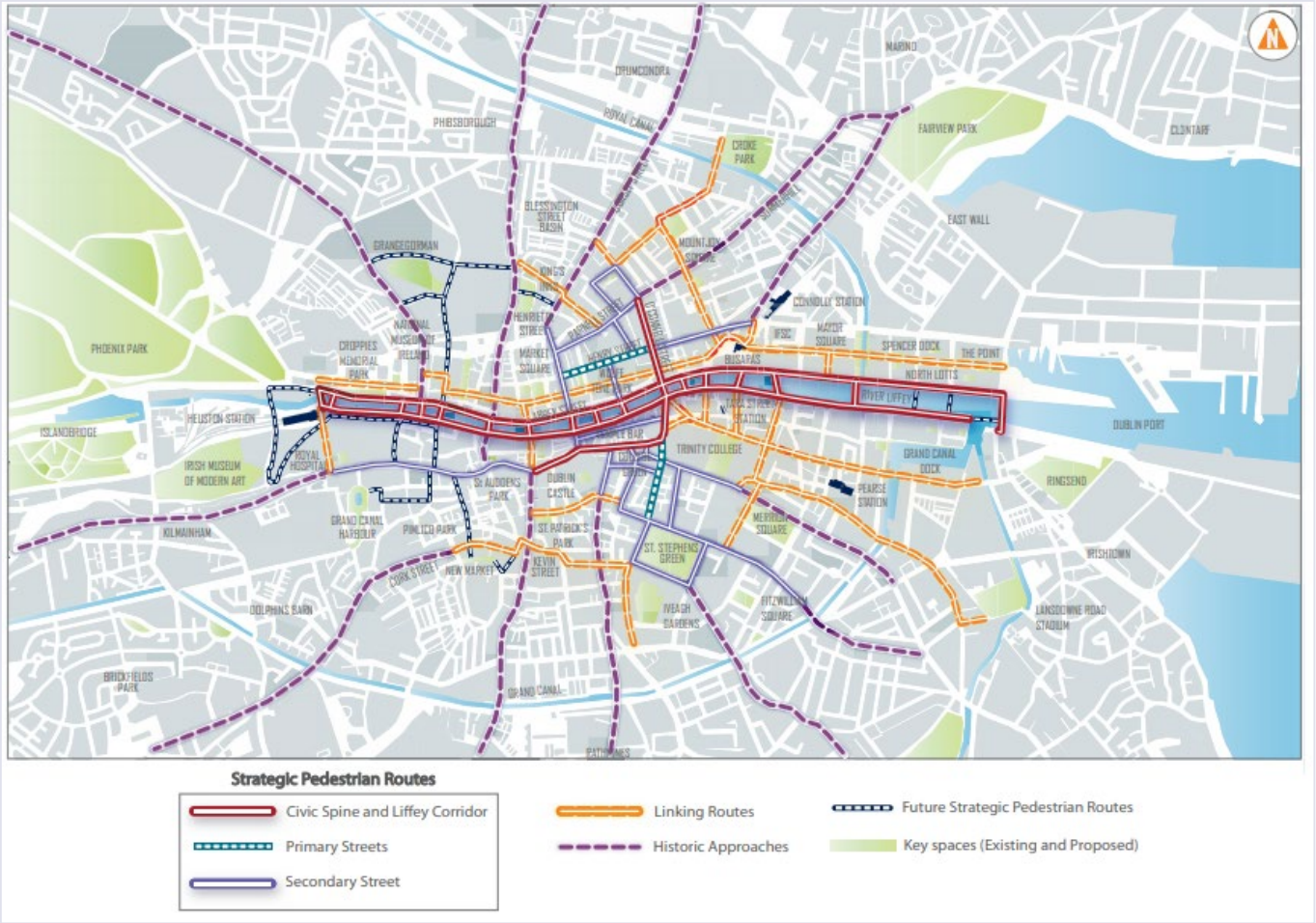

Diagram 9.4: DCC Pedestrian Street Hierarchy (Source: Dublin City Development Plan 2016-2022)

The magnitude of impacts to pedestrians is assessed through the changes (positive or negative) to the level of comfort from the baseline scenario to when the proposed Project passengers are added to the network.

The DCC document "The Heart of Dublin- City Centre Public Realm Masterplan" is the primary guidance for the design and management of the public realm in Dublin. The 'Pedestrian Space Calculator' was 'developed as part of this process to take account of all uses on the pedestrian space as well as the volume of users and is intended as the primary guidance mechanism for space allocation for pedestrians.'

From this, streets are categorised as Low, Moderate, High or Very High footfall based on the number of persons per hour. A 'Circulation Zone' is recommended for each category, suggesting the minimum unobstructed pavement width for the volume of people, as detailed below.

The guidelines indicate the following:

- Low Footfall = <600 pedestrians per hour, requires minimum 2m circulation zone;
- Moderate Footfall = 600-1200 pedestrians per hour, requires minimum 3m circulation zone;
- High Footfall = 1200-3000 pedestrians per hour, requires a minimum 4m circulation zone;
- Very High Footfall = >3000 pedestrians per hour, requires minimum 6m circulation zone.

Using this guidance, baseline conditions were assessed first to understand the current comfort levels without the addition of Project passengers. In the Future Year scenarios, passengers were assigned by the model (including population forecasts in the Design Years) to assess the impact the proposed Project will have on the network. The Scenario A 2050 Design Year was assessed, with Scenario A 2065 also assessed as the 'worst-case scenario' for passenger numbers, as this scenario has the highest volume of total AM passenger demand in the Future Year between both Scenario A and Scenario B

(almost 61,000 AM boarding passengers across the alignment in Scenario A, compared to almost 55,000 AM boarding passengers in Scenario B). At all stations, the passenger demand in the AM peak hour is lower in Scenario B than in Scenario A, with the exception of Fosterstown Station where there is a 12% increase in Scenario B. As such, Scenario B has not been assessed, with the exception of Fosterstown Station to ensure that all possible significant impacts are accounted for.

Links which fell below the recommended circulation zone width for the respective volume of pedestrians per hour were then assessed using the Transport for London (TfL) Pedestrian Comfort Guidance for London- Pedestrian Comfort Assessment. The TfL Pedestrian Comfort Guidance provides different comfort level for footways and takes into consideration the location of the footway, the numbers of pedestrians using it and the clear width of the footway.

For the purposes of the assessment, it was assumed that all of the proposed Project's pedestrian movements are 'new' onto the network, i.e. that they are not currently occurring along this section of the footway network. This is a conservative estimate as some of the proposed Project's passengers will be existing users of the areas.

The change in pedestrian comfort level (PCL) from one grade in the baseline scenario to another grade in the Do Something scenario, was utilised to measure the magnitude of the impact of the proposed Project on pedestrians, as presented in Table 9.8. The combination of the sensitivity and magnitude of the impact were then used to determine the significance of the impact.

Table 9.8: Pedestrian Impact Assessment Magnitude Gradings

User Group	Effect /Impact	Comfort Analysis				
Pedestrians	**From ↓ TO →**	**PCL A**	**PCL B**	**PCL C**	**PCL D**	**PCL E**
	PCL A	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact	Very High Negative Impact
	PCL B	Low Positive Impact	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact
	PCL C	Medium Positive Impact	Low Positive Impact	Negligible	Low Negative Impact	Medium Negative Impact
	PCL D	High Positive Impact	Medium Positive Impact	Low Positive Impact	Negligible	Low Negative Impact
	PCL E	Very High Positive Impact	High Positive Impact	Medium Positive Impact	Low Positive Impact	Negligible

9.4.8.2.1.3 Cyclists

The significance and sensitivity of cycle routes around the stations has been informed by the NTA's GDA Cycle Network Plan (NTA, 2013):

- The Urban Cycle Network at the Primary, Secondary and Feeder level;
- The Inter-Urban Cycle Network linking the relevant sections of the Urban Network and including the elements of the National Cycle Network, including linkages to key transport locations outside of urban areas such as airports and ports; and
- The Green Route Network being cycle routes developed predominantly for tourist, recreational and leisure purposes.

Under the Draft GDA Transport Strategy 2022-2042, a Draft GDA Cycle Network Plan has been prepared (2021). The Cycle Network Plan largely follows the same categorisation of routes, with the addition of a distinction between 'Primary Radial' and 'Primary Orbital' routes as part of the strategic network. As a Draft plan, the current adopted classifications have been utilised for the purposes of this assessment.

Additionally, the 'place context value' of the route is also considered in determining the significance and sensitivity of the cycle network, as identified in Table 9.6. Local factors on these routes have also been taken into consideration to determine the significance and sensitivity of cycle routes, for example if there is a school nearby which utilises cycle facilities and would be sensitive to change in infrastructure or volumes of cyclists.

The impact to cyclists is assessed using the NTA's National Cycle Manual's Quality of Service Evaluation (NTA 2011), which assesses the quality service based on the pavement condition, number of adjacent cyclists, number of conflicts per 100m of route, journey time delay and HGV influence. The National Cycle Manual identifies ratings for the Quality of Service, from 'A+' to 'D'.

The magnitude of impact to cyclists is assessed through the change to Quality of Service (positive or negative) for cyclists from the Do Minimum to the Do Something scenario, as presented in Table 9.9. The combination of magnitude and sensitivity of impact were then used to determine the significance of the impact to cyclists.

Table 9.9: Cyclist Impact Assessment Magnitude Gradings

User Group	Effect /Impact	Changes in Quality of Service (QoS)				
Cyclists	**From ↓ To →**	**A+**	**A**	**B**	**C**	**D**
	A+	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact	Very High Negative Impact
	A	Low Positive Impact	Negligible	Medium Negative Impact	High Negative Impact	Very High Negative Impact
	B	Medium Positive Impact	Medium Positive Impact	Negligible	High Negative Impact	Very High Negative Impact
	C	High Positive Impact	High Positive Impact	High Positive Impact	Negligible	High Negative Impact
	D	Very High Positive Impact	Very High Positive Impact	Very High Positive Impact	High Positive Impact	Negligible

9.4.8.2.1.4 Public Transport

The sensitivity and significance of the public transport network has been informed by the proposals for Bus Network Redesign, as well as other modes of high frequency public transport such as DART and Luas.

The change in end-to-end public transport journey times, along with the increase/decrease in passenger numbers, has been utilised to understand the magnitude of impact on public transport services in the Study Area. The Increase in passenger flows on public transport informs the magnitude of the effect (percentage difference between Do Minimum and Do Something scenarios), as presented in Table 9.10.

Table 9.10: Public Transport Magnitude Gradings – Increase in Flows

User Group	Effect/Impact	Increase in Flows (Passengers) during congested periods			
		No Change from Baseline	+/- 0% to 10% from baseline	+/- 10% to 25% from baseline	+/- >25% from baseline
Public Transport Users	Bus	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Train	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Luas	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Stop	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact
	Station	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact

In a similar way, the impact on the number of public transport trips to and from the geographic sections has been assessed. Table 9.11 presents the magnitude gradings for the change in public transport trips, based on the percentage difference between the Do Minimum and Do Something scenarios These categories have been identified using professional judgement.

Table 9.11: Public Transport Magnitude Gradings- Change in PT Trips

User Group	Effect /Impact	Change in Public Transport Trips				
		+/- 0% to 10% from baseline	+/- 10% to 25% from baseline	+/- 25% to 50% from baseline	+/- 50% to 100% from baseline	+/- >100% from baseline
Public Transport Users	All PT Modes	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact	Very High Positive/Negative Impact

Table 9.12 presents the magnitude of the impact on change in public transport capacities, based on the percentage difference between Do Minimum and Do Something scenarios.

Table 9.12: Public Transport Magnitude Gradings - Public Transport Capacities

User Group	Effect /Impact	Change in Public Transport Capacities				
		+/- 0% to 5% from baseline	+/- 5% to 10% from baseline	+/- 10% to 15% from baseline	+/- 15% to 20% from baseline	+/- >20% from baseline
Public Transport Users	All PT Modes	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact	Very High Positive/Negative Impact

Table 9.13 presents the magnitude of the impact on change to journey time, based on the percentage difference between Do Minimum and Do Something scenarios.

Table 9.13: Public Transport Magnitude Gradings – Journey Time Delays

User Group	Effect/ Impact	Journey Time Delays			
		No Change from Baseline	+/- 0% to 10% from baseline	+/- 10% to 25% from baseline	+/- >25% from baseline
Public Transport Users	Bus	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Train	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Luas	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact

Table 9.14 presents the magnitude of impact on public transport network statistics, based on the percentage change from the Do Minimum to Do Something scenarios.

Table 9.14: Public Transport Magnitude Gradings- Network Statistics

User Group	Effect /Impact	Change in Public Transport Network Statistics				
		+/- 0% to 5% from baseline	+/- 5% to 10% from baseline	+/- 10% to 15% from baseline	+/- 15% to 20% from baseline	+/- >20% from baseline
Public Transport Users	Passenger Km	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact	Very High Positive/Negative Impact

9.4.8.2.1.5 General Traffic

The magnitude of impact on General Traffic Vehicles is assessed through an examination of the change in traffic on a link, change in road travel time on links, quantum of parking or loading bays removed.

The magnitude of the impact on the increase in Passenger Car Units (PCUs) on the road network is determined by the difference in AADT between Do Minimum and Do Something scenarios, as presented in Table 9.15. The categories of values have been identified using professional judgement. The combination of the magnitude of the change in flows, and the significance and sensitivity of the road network is used to determine the significance of the impact.

Table 9.15: General Traffic Magnitude Gradings – Increase in Flows

User Group	Effect/Impact	Change in Flows (AADT/Hour)			
Vehicle		+/- 100 AADT	+/- 100 < 500 AADT from baseline	+/- 500 < 2,500 AADT from baseline	+/- >2,500 AADT from baseline
	Local (Residential)	Negligible Negative Impact	Medium Negative Impact	High Negative Impact	Very High Negative Impact
	Link (Regional)	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	National (Arterial)	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Motorway	Negligible Negative Impact	Low Negative Impact	Low Negative Impact	Medium Negative Impact

In a similar way, the impact on the number of car trips to and from the geographic sections has been assessed. Table 9.16 presents the magnitude gradings for the change in car trips, based on the

percentage difference between the Do Minimum and Do Something scenarios These categories have been identified using professional judgement.

Table 9.16: General Traffic Magnitude Gradings - Car Trips

User Group	Effect/Impact	Change in Car Trips			
General Traffic Users	**Network**	**+/-0% < 1% from baseline**	**+/- 1% < 5% from baseline**	**+/- 5% <10% from baseline**	**+/- > 10%**
	Local (Residential)	Negligible Negative Impact	Medium Negative Impact	High Negative Impact	Very High Negative Impact
	Link (Regional)	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	National (Arterial)	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Motorway	Negligible Negative Impact	Low Negative Impact	Low Negative Impact	Medium Negative Impact

The magnitude of the impact to road travel time is determined via the difference in seconds between Do Minimum and Do Something scenarios. The categories of values have been identified using professional judgement. The combination of the magnitude of the change in road travel time, and the significance and sensitivity of the road network is used to determine the significance of the impact.

Table 9.17: General Traffic Magnitude Gradings – Change in Road Travel Time

User Group	Effect/Impact	Change in Road Travel Times			
General Traffic Users	**Network**	**+/- 10 seconds**	**+/- 10 < 50 seconds from baseline**	**+/- 50 < 250 seconds from baseline**	**+/- >250 seconds from baseline**
	Local (Residential)	Negligible Negative Impact	Medium Negative Impact	High Negative Impact	Very High Negative Impact
	Link (Regional)	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	National (Arterial)	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Motorway	Negligible Negative Impact	Low Negative Impact	Low Negative Impact	Medium Negative Impact

Table 9.18 presents the magnitude of impact on overall road network statistics, based on the percentage change from the Do Minimum to Do Something scenarios.

Table 9.18: General Traffic Magnitude Gradings - Network Statistics

User Group	Effect /Impact	Change in Road Network Statistics				
General Traffic Users		+/- 0% to 5% from baseline	+/- 5% to 10% from baseline	+/- 10% to 15% from baseline	+/- 15% to 20% from baseline	+/- >20% from baseline
	PCU per hours	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact	Very High Positive/Negative Impact
	KM per Hours	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact	Very High Positive/Negative Impact
	Average Speed (Km/hr)	Negligible Impact	Low Positive/Negative Impact	Medium Positive/Negative Impact	High Positive/Negative Impact	Very High Positive/Negative Impact

9.4.8.2.1.6 Parking and Loading

The magnitude of impact on all parking and loading (on-street, commercial, residential, car-parks) is measured by the change to the number of spaces measured by the percentage difference between Do Minimum and Do Something scenarios. The categories of values have been identified using professional judgement. The combination of the magnitude of the change in spaces, and the significance and sensitivity of the place context is used to determine the significance of the impact.

Table 9.19: Parking Magnitude Gradings

User Group	Effect/Impact	Parking - Change in Number of Spaces			
Vehicles		No Change from Baseline	+/- 0% to 10% from baseline	+/- 10% to 25% from baseline	+/- >25% from baseline
	City Centre	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Town Centre	Negligible	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Neighbourhood	Negligible	Medium Negative Impact	High Negative Impact	Very High Negative Impact

The magnitude of impact to all commercial loading bays is measured by the distance of which the loading bay has been relocated to (in metres). The categories of values have been identified using professional judgement. The combination of the magnitude of the change in distance, and the significance and sensitivity of the place context is used to determine the significance of the impact.

Table 9.20: Loading Bays Magnitude Gradings

User Group	Effect/Impact	Loading Areas/Bays (distance to next available)			
Other Users		**Relocated by 10m or less**	**Relocated by 50m**	**Relocated by 100m**	**Relocated by 200m or more**
	City Centre	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
	Town Centre	Negligible Negative Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact

9.4.8.2.1.7 Other Users

The magnitude of impact on Other Users is assessed based on the access to entry points for schools, commercial premises, residential, public services, which is measured by distance of relocation to entrance/access (in metres). The categories of values have been identified using professional judgement, as specified guidance is not available. The combination of the magnitude of the change in distance, and the significance and sensitivity of the user is used to determine the significance of the impact.

The reader should refer to Chapter 6 (MetroLink Operations & Maintenance) for details of the how the design of the system caters for universal access and the relevant design standards used in the design of the proposed Project.

Table 9.21: Other Users Magnitude Gradings

User Group	Effect/Impact	Access to entry points e.g. shops, schools, public services, residential			
Other Users		**Relocated by 10m or less**	**Relocated by 50m**	**Relocated by 100m**	**Relocated by 200m+**
		Not Significant	Slight	Moderate	Significant

The transport and traffic modelling processes used to assess the impact of the proposed Project ensures that both local and strategic impacts are understood and that appropriate mitigation measures are identified.

9.4.8.2.2 Construction Phase

As identified in section 9.4.7, the STMP assessment of the Construction Phase assesses the magnitude of the transport impact only, without identifying the significance and sensitivity of the receptor. The significance and sensitivity of the receptor is identified within this EIAR assessment, which is then combined with the magnitude of the impact (from the STMP assessment), to identify the overall Significance of the impact. As part of the STMP's assessment methodology, the magnitude Ratings for transportation impacts of Construction Impacts are categorised broadly into three levels of or 'slight', 'moderate' or 'severe'. Table 9.22 present the performance indicators used in the STMP Stage 1 and Stage 2 Assessments, and the Assessment Criteria Ratings associated with the STMP assessment of the magnitude of impacts only.

Table 9.22: STMP Stage 2 Assessment Criteria Rating Table

RATING	General Traffic			HGV	Public Transport		Cyclists			Pedestrians				Commercial/ retail loading		Parking	
	Increase in traffic flow (PCUs)	Increase in Driver Delay (seconds)	Diversion for local access	Increase in HGV flows	Bus journey times	Alterations to bus stops	Safety - Increase in traffic flow (PCUs)	Infrastructure Impact Measure (Material levels of Cyclists)	Increase in journey length	Safety - Increase in traffic flow (PCUs)	Pedestrian volume	Infrastructure Impact Measure	Increase in journey length	Diversion for access	Reduction of on-street loading facilities	Residential/ Public on-street loss	Commercial loss
Slight	<10%	<180s	<400m	<5%	<180s	<200m	10%	Cycle lane/path moved (within 100m)	<200m	10%	Low (<600)	Footpath or crossing moved or narrowed (within 100m)	<100m	<1km	Alt loading bay is <100m	<10% within 200m	<10% within 200m
Moderate	10% -30%	180s - 300s	400m - 800m	5-10%	180s - 300s	200m - 500m	10% -30%	Cycle lane/path removed with need to use nearby alternative (within 100m - 250m)	200m - 500m	10% -30%	Medium (600-1200)	Footpath or crossing removed or narrowed with need to use nearby alternative (within 100m - 250m)	100 - 250m	1km - 2km	Alt loading bay is 100m - 200m	10% - 30% within 200m	>10% within 200m
Severe	>30%	>300s	>800m or closed	>10%	>300s	>500m	>30%	Cycle lane/path removed with no alternative	>500m	>30%	High (>2000)	Footpath or crossing removed with no alternative	>250m	>2km	Alt loading bay is >200m	>30% within 200m	>30% within 200m
Method of Analysis	**Junction Modelling /ERM**	**Junction Modelling /ERM**	**Maps/Drawings**	**ERM**	**PT Schedule Data/Drawings**	**Drawings**	**Junction Modelling /ERM**	**Drawings**	**Drawings**	**Junction Modelling /ERM**	**Pedestrian count data**	**Drawings**	**Drawings**	**Drawings**	**Drawings**	**Drawings**	**Drawings**

9.4.8.2.2.1 STMP Two-Stage Screening Methodology

A two-stage assessment screening process was utilised for the identification of potential effects at a local level. This two-stage process used a combination of the potential magnitude and the duration of the traffic management intervention to determine if the potential impacts of the traffic management required further analysis and progress to the stage 2 assessment. The list of performance indicators was used to determine the potential magnitude.

Table 9.23 shows the criteria used in this two-stage assessment screening process, and Table 9.24 shows the performance indicators used.

The detailed methodology and specific user impact assessment results for each station location and for the overall road network are set out in the STMP (Appendix A9.5).

Table 9.23: STMP Criteria Utilised in Screening Process

Potential Magnitude /Time Frame	Only night-time and weekends	Short term (<1 month)	Medium term (1-6 months)	Medium - Long term (6 months-1 year)	Long Term (1+year)
Low/Slight	Stage 1 Only	Stage 1 Only	Stage 1 Only	Stage 1 Only	Stage 1 Only
Moderate	Stage 1 Only	Stage 2	Stage 2	Stage 2	Stage 2
High/Severe	Stage 1 Only	Stage 2	Stage 2	Stage 2	Stage 2

Table 9.24: STMP Stage 2 Assessment: Performance Indicators for User Group Impact Assessments (Local)

User Group		Performance Indicator
General Traffic		Removal of one or more lanes of traffic
	Or	Increase in traffic flow of +10% (PCUs)
	Or	Increase in driver delay of +180 seconds
	Or	Where there is predicted to be a permanent increase in journey length of 500m
	Or	New signalized junction
Public Transport		Removal of existing bus lane
	Or	Diversion of over 500m
Cyclist		Reduction in quality of service (by one level or more)
	Or	Diversion of over 300m
Pedestrian		Removal of footpath/reduction of service
Vulnerable User		Removal or pedestrian crossing
	Or	Relocation of crossing by more than 100m
Commercial/Retail (Loading)		Reduction of on-street loading facilities (within 200m)
	Or	Diversion of over 2km for access
Residential (Parking)		Removal of >30% of on-street parking within 200m
Commercial (Parking)		Removal of >10% of parking within 200m

9.4.8.2.2.1.1 STMP Rating Criteria for Vehicular Traffic

As an indication of how changes to traffic flow are assessed, the broad standard practices are:

- Highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and

- Any other specifically sensitive areas where traffic flows have increased by 10% or more. (Specifically, sensitive areas would include accident blackspots, conservation areas, hospitals, links with high pedestrian flows etc.).

Table 9.25 further outlines the criteria for classifying the impact of increases in traffic flows.

Table 9.25: STMP Categorisation of Impact Rating for General Traffic

Traffic Flow Increases	Description
<10% - Slight	Traffic flow increases directly attributable to the Project of less than 10% are not considered likely to give rise to any potential significant effects.
10% to 30% - Moderate	Traffic flow increases of 10% to 30% are only considered to give rise to significant effects in specifically sensitive areas. For accidents, this is defined as any road link with more than 15 accidents in the last five-year period for which data is available.
>30% - Severe	Traffic flow increases directly attributable to the Project of more than 30% are considered likely to give rise to potentially significant effects.

9.4.8.2.2.1.2 STMP Rating Criteria or Driver Delay

Where the potential of driver delay is identified, Table 9.26 outlines the methodology of assessing the impact category.

Table 9.26: STMP Categorisation of Impact Rating for Driver Delay

Driver Delay	Description
<180 seconds - Slight	Driver delay increases directly attributable to the Project of less than 180 seconds are not considered likely to give rise to any potential significant effects.
180 - 300 seconds - Moderate	Driver delay increases of 180 to 300 seconds are only considered to give rise to significant effects in specifically sensitive areas.
>300 seconds - Severe	Driver delay increases directly attributable to the Project of more than 300 seconds are considered likely to give rise to potentially significant effects.

9.4.8.2.2.1.3 STMP Rating Criteria for Public Transport Journey Time

Where the potential of public transport journey time increases is identified, Table 9.27 outlines the methodology of assessing the impact category.

Table 9.27: STMP Categorisation of Impact Rating for Public Transport Journey Times

Public Transport Journey Time Delay	Description
<180 seconds - Slight	Journey time delay increases directly attributable to the Project of less than 180 seconds are not considered likely to give rise to any potential significant effects.
180 - 300 seconds - Moderate	Journey time delay increases of 180 to 300 seconds are only considered to give rise to significant effects in specifically sensitive areas.
>300 seconds - Severe	Journey time delay increases directly attributable to the Project of more than 300 seconds are considered likely to give rise to potentially significant effects.

9.4.8.2.2.1.4 STMP Rating Impact on Cyclist Amenities/Safety

For cyclist amenity, account is taken of available data for cyclist information on a qualitative basis. Potential significant effects are deemed to exist if, at a specified location, the following criteria exist:

- There is predicted to be an increase in total traffic flow of more than 30% and the increase is more than 25% movements per day;
- There is an existing cycle facility being affected or the works are affecting a planned cycle facility identified as being on a proposed cycle route plan;
- There is removal of a cycle link which requires cyclists to alter their journey pattern by at least 300m; and
- The sensitivity of the area is 'high' (e.g. conservation area, major community facility).

9.4.8.2.2.1.5 STMP Rating Impact on Pedestrian Amenities/Safety

For pedestrian amenity, account is taken of available data for pedestrian information on a qualitative basis. Potential significant effects are deemed to exist if, at a specified location, the following criteria exist:

- There is predicted to be an increase in total traffic flow of more than 30% and the increase is more than 25% movements per day;
- There are 'material' levels of pedestrians;
- There is removal of a pedestrian link (footbridge, crossing or footway) which requires pedestrians to alter their journey pattern by at least 100m; and
- The sensitivity of the area is 'high' (e.g. conservation area, major community facility).

9.4.8.2.2.1.6 STMP Rating Impact on Commercial Loading Facilities

Where there is an identified impact on commercial or retail loading facilities, directly due to either main construction or utilities works, the following criteria exist to assess the severity:

- Reduction of on-street loading facilities (within 200m); and
- Diversion of over 2km for access.

9.4.8.2.2.1.7 STMP Rating Impact on Residential and Commercial Parking Facilities

Where there is an identified impact on residential or commercial parking facilities, directly due to either main construction or utilities works, the following criteria exist to assess the severity:

- Residential facilities: Removal of over 30% of on-street parking within 200m; and
- Commercial facilities: Removal of over 10% of parking within 200m.

9.4.8.3 EIAR Impact Assessment Methodology; Criteria and Categorisation

The impact assessment criteria are based on the Guidelines on the Information to be contained In the Environmental Impact Assessment Reports (EPA 2022) (hereafter referred to as EPA Guidelines).

Chapter 2 (Methodology Used in Preparation of the EIAR) details the appraisal methods for the assessment of impacts, including the description of effects based on EPA Guidelines. Diagram 9.5 shows the interrelationships between the significance/sensitivity of the receiving environment, and the magnitude of the impact in determining the significance of the impact. The following section will examine how this graph was applied to each of the identified effects to determine the significance of the impact.

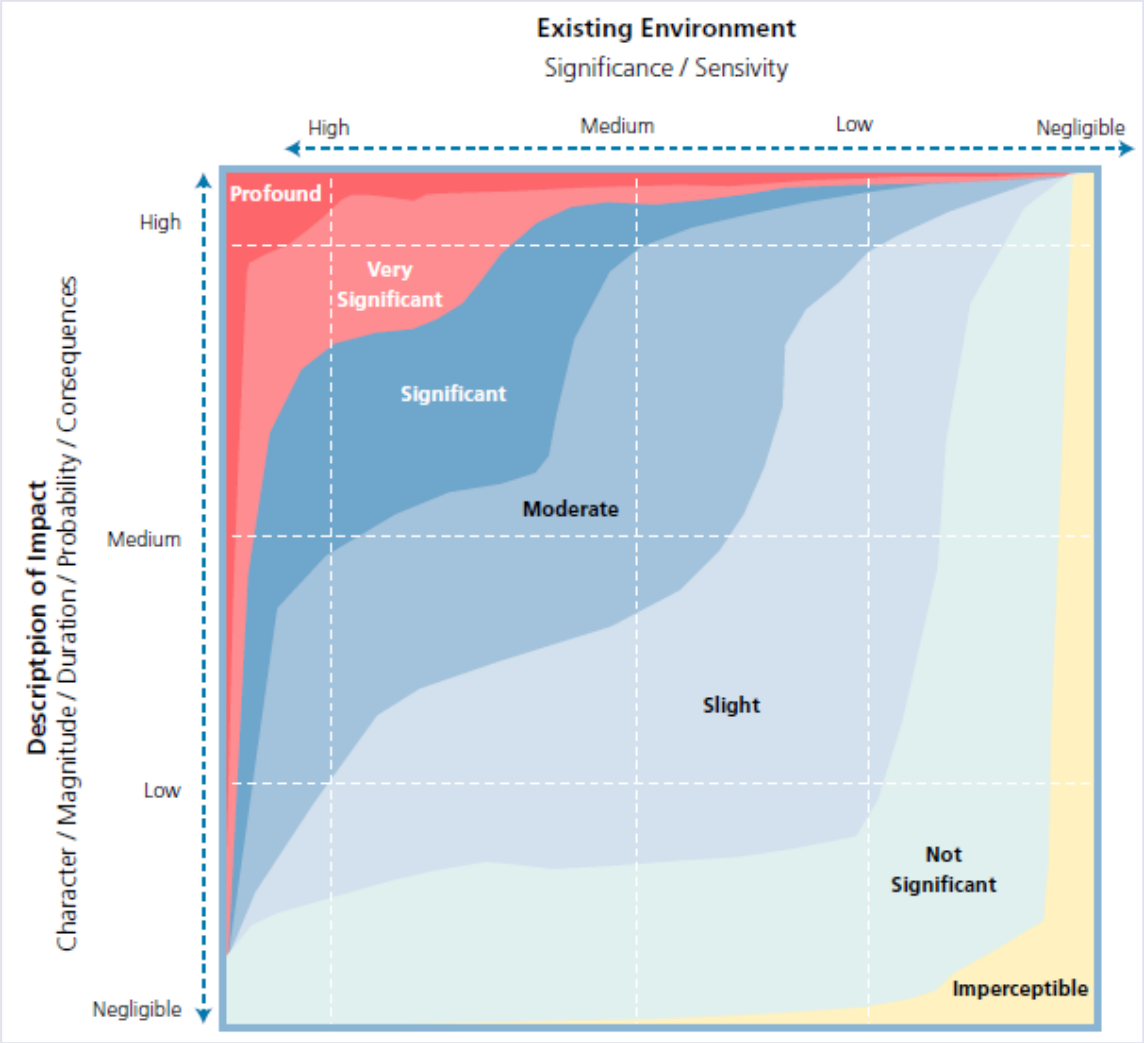

Diagram 9.5: Typical Classifications of the Significance of Impacts (EPA, 2022)

9.5 Baseline Environment

This section details the current state of the receiving environment before the proposed Project is implemented, as well as detailing the future receiving environment (if other infrastructure proposals will be implemented before the proposed Project is operational). Comments will be provided on the condition, sensitivity and significance of relevant environmental factors which are likely to be significantly impacted by the proposed Project. In relation to Traffic and Transport, the following considerations are presented for each station:

- Public Transport Network;
- Road Network;
- Pedestrian Network, including facilities for Vulnerable Users;
- Cycle Network; and
- Parking Provisions.

9.5.1 Strategic Overview of Baseline Conditions

This section details an overview of the baseline strategic network, describing the baseline modal splits and travel patterns, the public transport network, the road network, the pedestrian network and the cycle network.

9.5.1.1 Modal Splits and Travel Patterns

Table 9.28 presents the volume of people within the 30-minute modal catchments of the station, in 2019, based on data provided by the Planning Datasheets. In all catchments, cycling has the largest volume of population within its 20-minute catchment at 566,785, however when increased to a 30-minute catchment, public transport has the largest proportion of population at 897,402.

Table 9.28: Population within Journey Time from Alignment in 2019

Mode	0-5mins	0-10mins	0-15mins	0-20mins	0-30mins
Walking	12,340	64,820	123,928	181,019	295,142
Cycling	116,368	304,388	446,491	566,785	790,236
PT to Metro	50,283	180,781	347,366	505,743	897,402

The South Fingal Transport Study (FCC 2019b) examined modal splits and daily travel patterns in a number of key areas within the study areas, such as Swords, Dublin Airport, and Fingal/Dublin Fringe. Using 2016 Census POWSCAR data, the Study notes that 'the only significant public transport mode share is from Swords to the City Centre' accounting for 55% of the modal split. Similarly, the share of public transport from the western areas of Swords is approximately 20%, with nearly all of these travelling to Dublin City Centre. In terms of active travel, the only significant active travel mode share is for trips which stay within Swords, accounting for 43% of the mode share.

The FCC (2019b) Study notes that the population of the Fingal/Dublin Fringe, to the east of the M1 as shown in Diagram 9.6, generates approximately 17,500 total work trips, and approximately 11,500 total school trips daily. Of the total work trips, nearly 5,500 trips are within the M50 Motorway and north of Dublin City Centre, with Car accounting for 71% of the mode share. Over 5,000 trips travel into Dublin City Centre, however public transport holds the largest modal split with 66%, and Car accounting for 28%. Just under 2,000 trips continue further south (within the M50 Motorway), with Car holding the majority mode share.

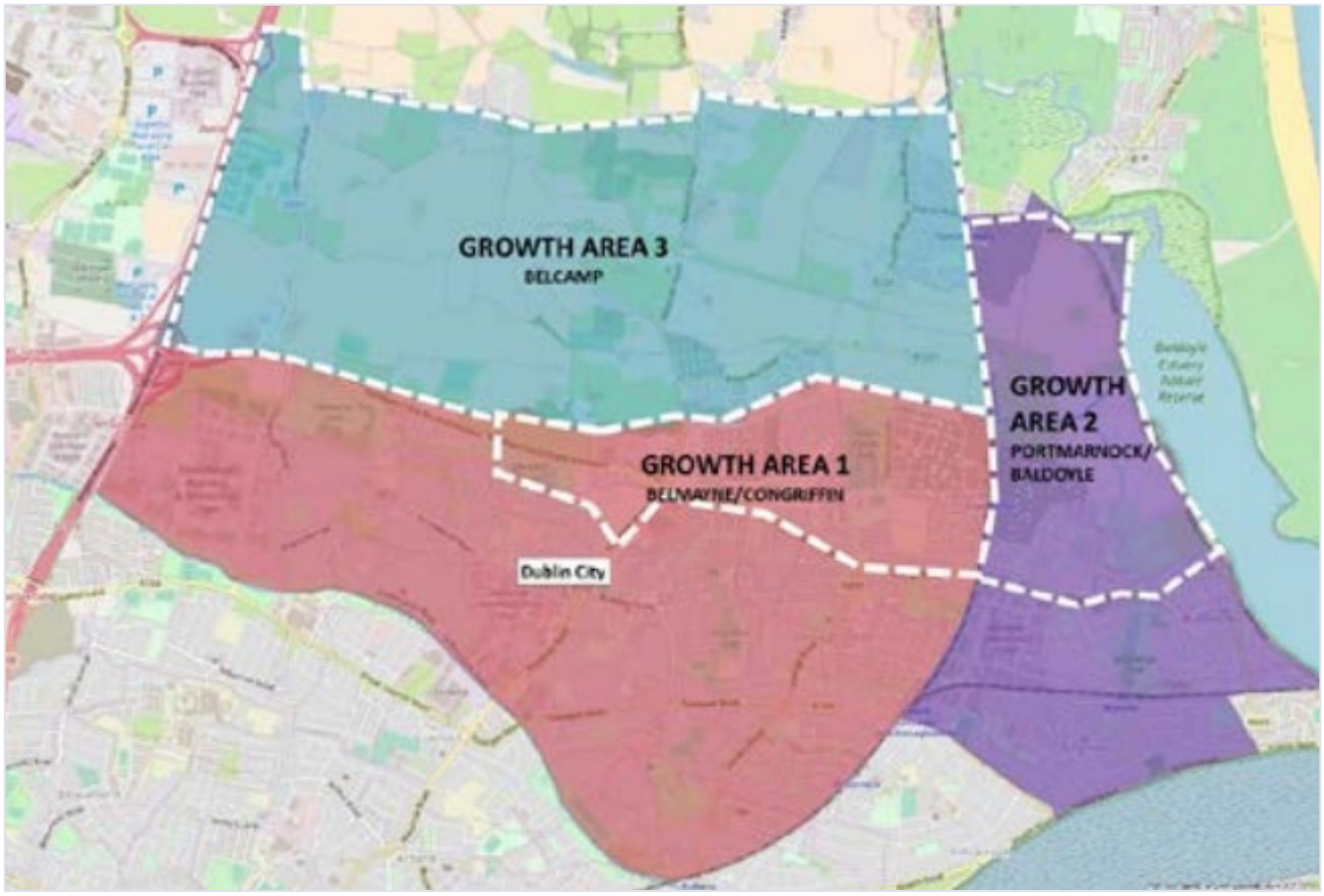

Diagram 9.6: Fingal/Dublin Fringe Sectors (FCC 2019b)

Dublin Airport is recognized as the largest single destination for work trips from Swords, with nearly 2,000 trips from Swords each day. Of these 2,000 trips, 75% are by car, 21% are by public transport, and less than 100 trips are by active modes.

Diagram 9.7 presents the surface access modal split of Air Passengers between 2006 and 2016. Car mode share has decreased through the years, with an increase in Bus in 2016 (NTA), however vehicular based modes continue to account for over half of the total mode share, with private cars accounting for 33%, and taxi accounting for 22%.

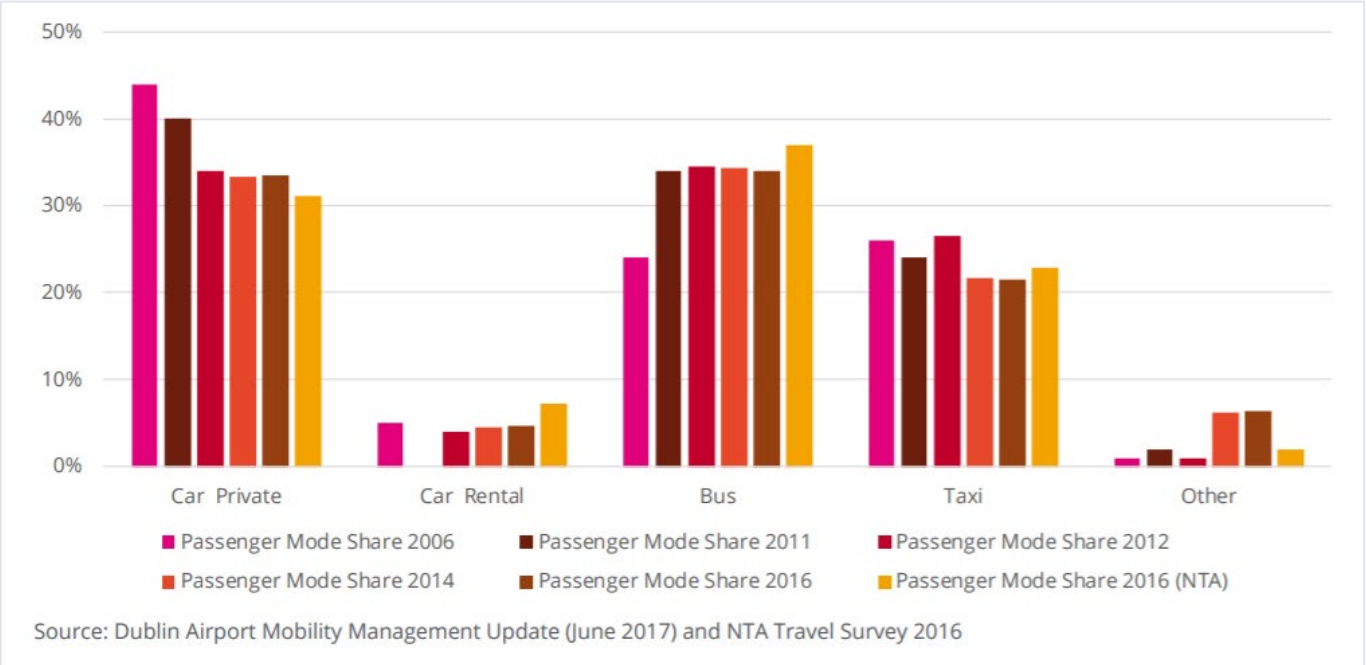

Diagram 9.7: Air Passenger Surface Access Mode Shares (FCC 2019b)

The South Fingal Transport Study notes that the majority of Dublin Airport staff drive to work, with 67% as self-driven, and 5% as a passenger. Approximately 21% use bus, with small proportions using taxi, non-mechanised modes or other modes. Of the 11,000 daily total work trips travelling to Dublin Airport, almost 4,000 work trips originate from areas outside of Dublin, followed by 2,500 work trips originating from within the M50 Motorway (North).

2016 Census data for 'Dublin City and suburbs' (CS0 2016) indicates that of the total 508,842 trips, 48% are a combination of 'Motor Car Drivers' and 'Motor Car Passengers'. 14% of the total trips are by Bus (bus, minibus or coach), while approximately 8% are by Train, DART or Luas, giving a total 22% of mode share held by all modes of public transport.

The Canal Cordon Report 2019 (NTA 2019) details the percentage mode share for all modes of travel used by people travelling into Dublin City Centre between 07:00 and 10:00. In 2019, total public transport mode share accounted for 53.5% of mode share –Bus holds 29.9%, Rail holds 17.2%, and Luas holds 6.4%. The total public transport mode share has increased 0.9 percentage points from 2018, while Car mode share has decreased by 1.6 percentage points to 26.7% in 2019, demonstrating an ongoing modal shift in Dublin City Centre. Active modes of walking and cycling hold a combined mode share of 17.4%.

Table 9.29 presents a summary of the baseline modal split for trips within the GDA, based on a combination of the above reports.

Table 9.29: Summary of Baseline Modal Split for Trips within the GDA

	Public Transport	Road	Active Modes
Swords – Trips to city centre	21%	75%	4%
Swords – Trips within Swords	8%	49%	43%
Fingal/North Dublin Fringe – Trips North of M50 Motorway	45%	50%	5%
Fingal/Dublin Fringe- Trips to City Centre	66%	28%	6%
Dublin Airport	21%	72%	-
Dublin City and Suburbs	22%	48%	21%
Canal Cordon	53%	26.7%	17.4%

9.5.1.2 Public Transport Network

The public transport network in Dublin consists of the heavy rail network, the light rail network, and bus network. The heavy rail network consists of DART (Dublin Area Rapid Transit) trains, which run along Dublin Bay, serving Central Dublin and suburbs along the coast such as Malahide and Howth southwards to Greystones in County Wicklow, and Commuter services by Irish Rail which serve suburbs in the north, west and south of the city.

The light rail network consists of Luas trams, with the Red Line service running from east to west (and return) through Dublin City centre, and the Green Line service running north to south (and return) through Dublin City centre. These trams serve many areas of central Dublin and some residential areas in the surrounding area.

The remainder of the public transport network is served by the vast bus network present, illustrated in Diagram 9.8. The network is served by multiple operators such as Dublin Bus, Bus Éireann and Go-Ahead, as well as private operators serving Dublin Airport and Swords.

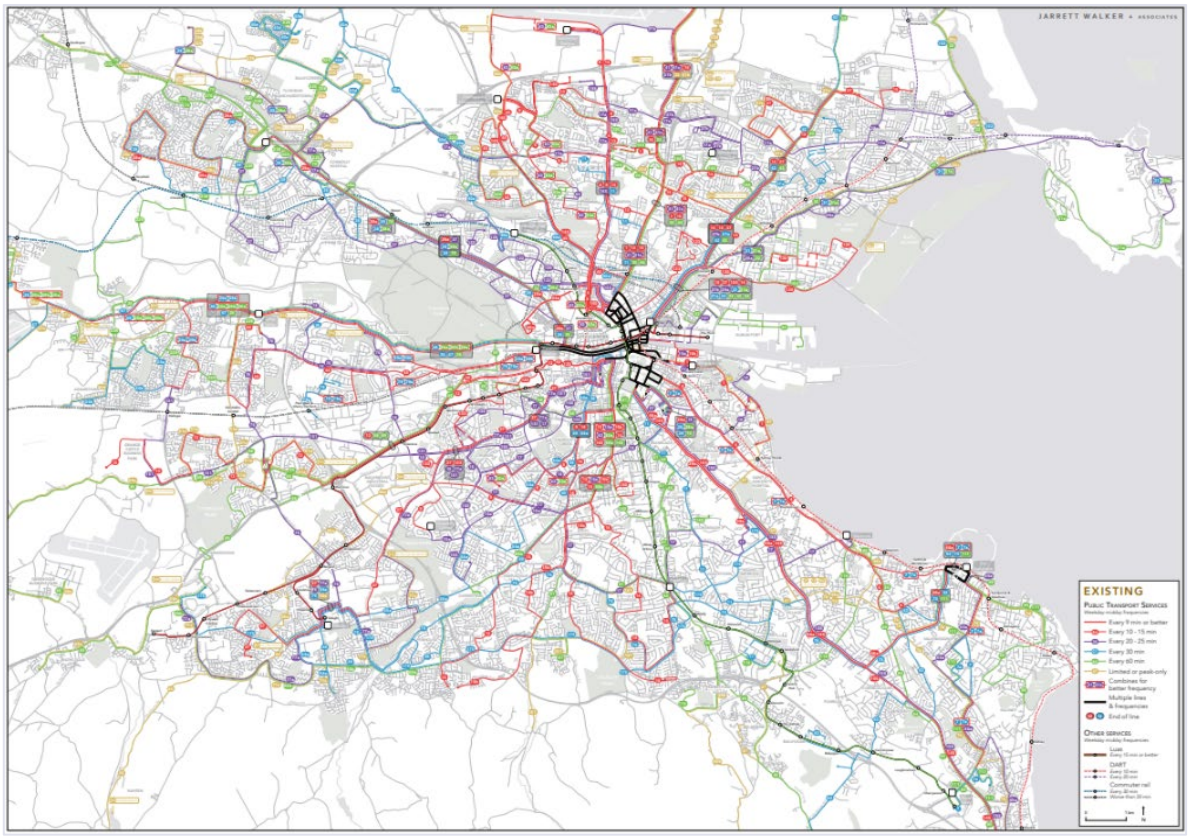

Diagram 9.8: Existing Bus Network (Source: www.busconnects.ie)

The assessment of impacts has also taken cognisance of the Bus Network Redesign proposals, which provide for Spine, Orbital, Other City Bound, Local and Peak only routes, with an extract of the Bus Network Redesign in Dublin City Centre shown in Diagram 9.9.

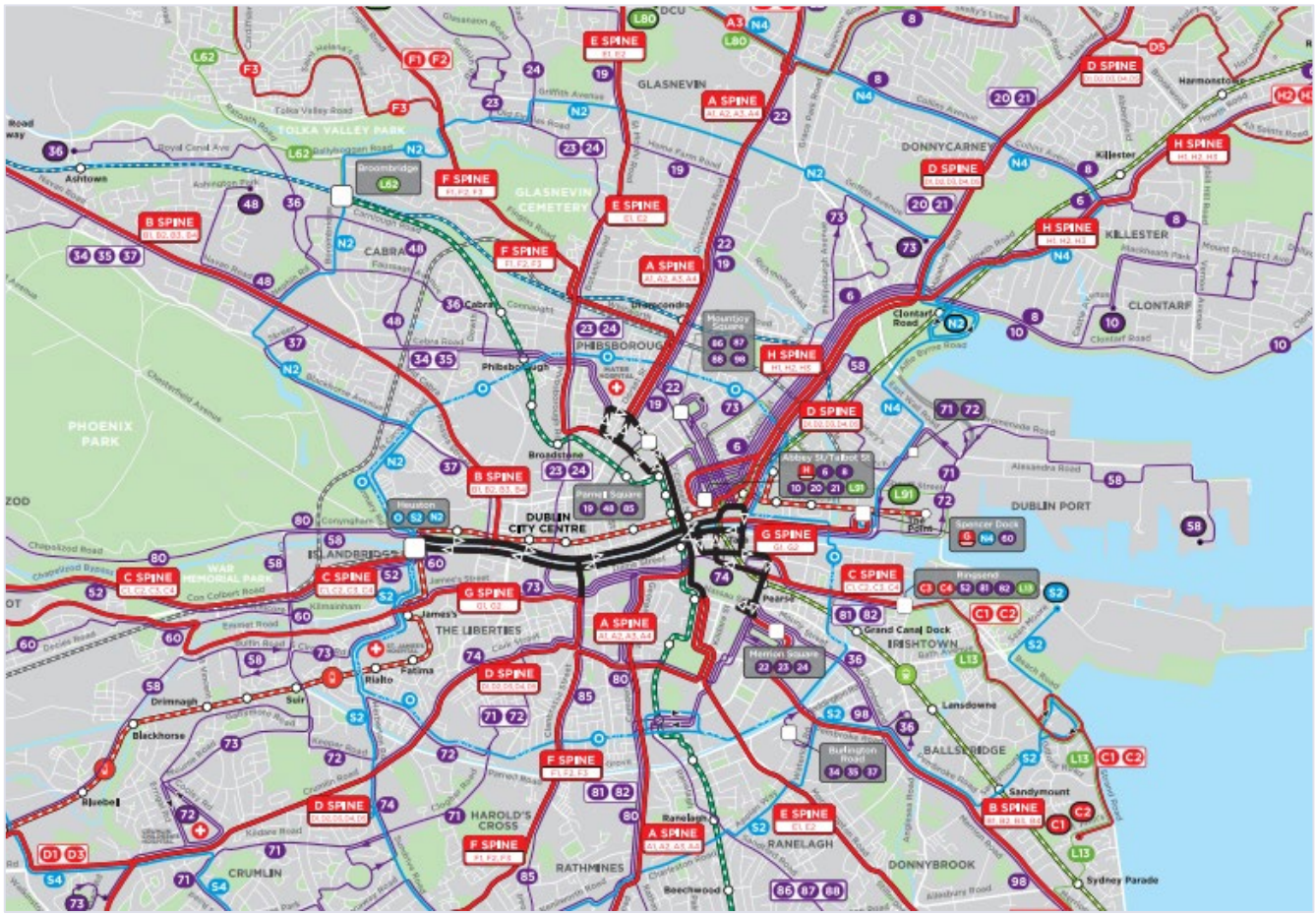

Diagram 9.9: Extract from Bus Network Redesign (Source: www.busconnects.ie)

9.5.1.2.1 Public Transport Network Statistics

Table 9.30 and Table 9.31 present the public transport network statistics in the Do Minimum scenarios in both Scenario A and Scenario B in the AM and PM peak periods within the Project's Area of Influence. Scenario B sees greater passenger kilometres travelled in total by public transport across 2035, 2050 and 2065. While there are fewer passenger kilometres travelled by bus in Scenario B, improvements to the rail and Luas networks contribute to higher total passenger kilometres travelled.

Table 9.30: Public Transport Network Statistics- Do Minimum Scenarios AM 3hr Peak Period

Network Statistics	Mode	2035		2050		2065	
		Scenario A	Scenario B	Scenario A	Scenario B	Scenario A	Scenario B
Passenger Km	Bus	1,264,718	1,107,260	1,433,825	1,102,110	1,610,782	1,231,367
	Rail	934,527	1,397,654	1,166,849	1,523,673	1,419,955	1,824,559
	Luas	375,410	337,330	441,504	534,625	514,062	611,610
	Metro	-	-	-	-	-	-
	Total	2,574,654	2,842,245	3,042,179	3,160,408	3,544,799	3,667,535

Similarly, in the PM peak period there are greater total public transport passenger kilometres travelled in Scenario B than in Scenario A across all three years in the Area of Influence. Whilst there are fewer passenger kilometres travelled by bus in Scenario B across all years, reductions in passenger kilometres by Luas are only seen in 2035, with increases of approximately 100,000 in both 2050 and 2065.

Table 9.31: Public Transport Network Statistics - Do Minimum Scenarios PM 3hr Peak Period

Network Statistics	Mode	2035		2050		2065	
		Scenario A	Scenario B	Scenario A	Scenario B	Scenario A	Scenario B
Passenger Km	Bus	1,236,047	1,114,472	1,380,944	1,139,407	1,519,362	1,273,201
	Rail	1,063,600	1,553,788	1,331,854	1,638,592	1,609,571	1,955,416
	Luas	353,991	318,303	416,218	516,068	486,635	595,100
	Metro	-	-	-	-	-	-
	Total	2,653,638	2,986,563	3,129,015	3,294,067	3,615,568	3,823,716

9.5.1.2.2 Public Transport Capacities

From the ERM modelling data, the Total Capacities of the existing public transport networks and Volume to Capacity Ratios have been extracted for Scenario A 2035, and Scenario B 2035. In the table, values less than 0.80 represent that the network is operating 'under capacity', values between 0.80 and 0.95 represent that the network is 'near capacity' and values greater than 1 represent that the network is operating 'Over Capacity'.

Table 9.32 shows that in both Scenario A and Scenario B, all rail services are under capacity, however Scenario B does note lower ratios. In Scenario A, the DART Northern Line and Luas Red Line have a ratio of 0.75, approaching the threshold for being considered 'near capacity'.

All key bus corridors identified in Scenario A are over capacity, with the exception of the N1 Drumcondra which is under capacity, and Dublin Airport (at the R132) which is 'near capacity'. In Scenario B, all identified bus corridors are either 'near capacity' or 'over capacity', with the exception of the N1 Drumcondra corridor. The Northwood/Ballymun Corridor, and the Ballymun Road/Finglas far exceed the capacity in both Scenario A and Scenario B.

Table 9.32: Volume to Capacity Ratio of Existing Networks in Opening Year

Maximum Volume to Capacity Ratio on line	Scenario A Do Min	Scenario B Do Min
PT Line	**2035**	**2035**
DART Northern Line	0.75	0.65
DART South-Eastern Line	0.44	0.27
Luas Green Line	0.66	0.59
Luas Red Line	0.75	0.64
DART Maynooth Line	0.48	0.58
DART Kildare Line	0.48	0.26
Bus Corridors		
Lissenhall (R132)	1.08	0.93
Swords (R132)	1.13	1.05
Dublin Airport (M1)	0.94	0.87
Dublin Airport (R132)	0.82	1
Northwood/Ballymun (Santry Avenue)	1.33	1.47
R108 Ballymun Road /R135 Finglas Road	1.14	1.24
N1 Drumcondra	0.36	0.39
South City (between Ranelagh and Rathmines	0.7	0.79

9.5.1.3 Road Network

The overall road network consists of a network of strategic roads such as motorways (M50 Motorway, M1 Motorway) and national primary roads (N2, N7) which provide high-capacity connections between the key regional centres and larger towns. The regional road network (R132 Swords Bypass, R108 Ballymun Road) and local road network (L2305 Nevinstown Lane, L2300 Boroimhe Road) provides access to smaller towns and centres within the Greater Dublin Area. Table 9.33 presents the roads within the proposed Project's study area which have been identified as having 'Very High' or 'High Significance' in the baseline scenario, with Figure 9.2 illustrating the overall road network. A selection of 'Medium' significance roads have also been included if they provide orbital connections, or are in very close proximity to the Project alignment.

Table 9.33: Selection of Significant Roads within Project Study Area

Road	Road Type	Significance	Nearest Station
M1 Motorway	Motorway	Very High	Estuary
SWDR	Regional Road	High	Swords Central
M50 Motorway	Motorway	Very High	Northwood
N2	National Road	High	Northwood
N1 Drumcondra Road Lower/Dorset Street Lower	National Road	High	R108 Stations (Northwood, Ballymun, Collins Avenue, Griffith Park, Glasnevin)
O'Connell Street	Dublin City Centre Link	High	O'Connell Street
R125 Swords Bypass	Regional Road	Medium, Proximity to Alignment	Estuary, Seatown, Swords Central, Fosterstown
R108 Ballymun Road	Regional Road	Medium, Proximity to Alignment	Ballymun, Collins Avenue/Griffith Park
R104 Santry Avenue	Regional Road	Medium, Orbital Route	Northwood, Ballymun
R103 Glasnevin Avenue/Collins Avenue Extension	Regional Road	Medium, Orbital Route	Collins Avenue
R105/R138 George's Quay	Regional Road	Medium, Orbital Route	Tara Street
R111 Grand Parade	Regional Road	Medium, Orbital Route	Charlemont

9.5.1.3.1 Overall Network Statistics

Table 9.34 and Table 9.35 present the overall road network statistics for both Scenario A and Scenario B in the Do Minimum AM and PM peak periods within the Project's Area of Influence. Across 2035, 2050 and 2065 in the AM peak period, there are fewer PCU hours per peak period, and fewer PCU kilometres per peak period in Scenario B than in Scenario A. The largest difference can be seen in the Total Road Distance Travelled in 2050, where there are 1,629,500 fewer PCU kilometres per peak period in Scenario B than in Scenario A. Alongside the reductions in total road travel time, there are increases in the average road network speed (kilometres per hour) in Scenario B when compared to Scenario A.

Table 9.34: Overall Network Statistics- Do Minimum Scenario AM 3hr Peak Period

Network Statistics	2035		2050		2065	
	Scenario A	Scenario B	Scenario A	Scenario B	Scenario A	Scenario B
Total Road Travel Time (PCU.hrs per peak period)	365,228	363,521	439,065	336,700	512,493	401,324
Total Road Distance Travelled (PCU.km per peak period)	14,417,697	14,259,221	16,010,097	14,380,597	17,263,083	15,772,179
Average Road Network Speed (kph)	38.6	39.1	37.7	40.5	36.9	39.5

Similarly in the PM peak period, there are fewer PCU hours per peak period travelled, and PCU kilometres per peak period travelled across all years in the Do Minimum scenario, with the exception of 2035 which sees almost 400 more PCU hours per peak period in Scenario B than in Scenario A. As with the AM peak period, the largest difference between the two scenarios can be seen in 2050 where there are 1,391,124 fewer PCU kilometres per peak period travelled in Scenario B than in Scenario A.

Table 9.35: Overall Network Statistics- Do Minimum Scenario PM 3hr Peak Period

Network Statistics	2035		2050		2065	
	Scenario A	Scenario B	Scenario A	Scenario B	Scenario A	Scenario B
Total Road Travel Time (PCU.hrs per peak period)	339,951	340,337	397,340	314,198	453,435	369,071
Total Road Distance Travelled (PCU.km per peak period)	13,791,124	13,572,426	15,149,517	13,758,393	16,320,545	15,100,811
Average Road Network Speed (kph)	39.5	40.0	38.7	40.5	38.0	40.6

9.5.1.4 Pedestrian Network

The Draft Fingal Development Plan 2023-2029 recognises the need to 'provide for a comprehensive network of pedestrian and cycle ways linking residential areas to one another, to the town centre [and] schools.' In addition to the provision of high-quality active travel infrastructure, 'an important measure of successful mobility is also dependent on quality of experience trough quality public realm, accessibility, permeability and legibility'. Fingal has the potential to develop an extensive network of strategic Greenway routes for walking and cycling to become attractive components of Fingal's integrated transport network, however at present there are no other classifications of pedestrian routes within the Fingal Development Plan.

DCC actively encourage walking as 'the foremost mode of transportation throughout the city' (DCC 2016a). The strategic pedestrian network helps identify important pedestrian routes in the context of related spaces and key destinations. DCC's Public Realm Strategy 'Your City - Your Space' (DCC 2012b) identifies important pedestrian routes and spaces within the city.

DCC also identify Strategic Pedestrian Routes within Dublin City Centre (DCC 2016a), identified in Diagram 9.10.

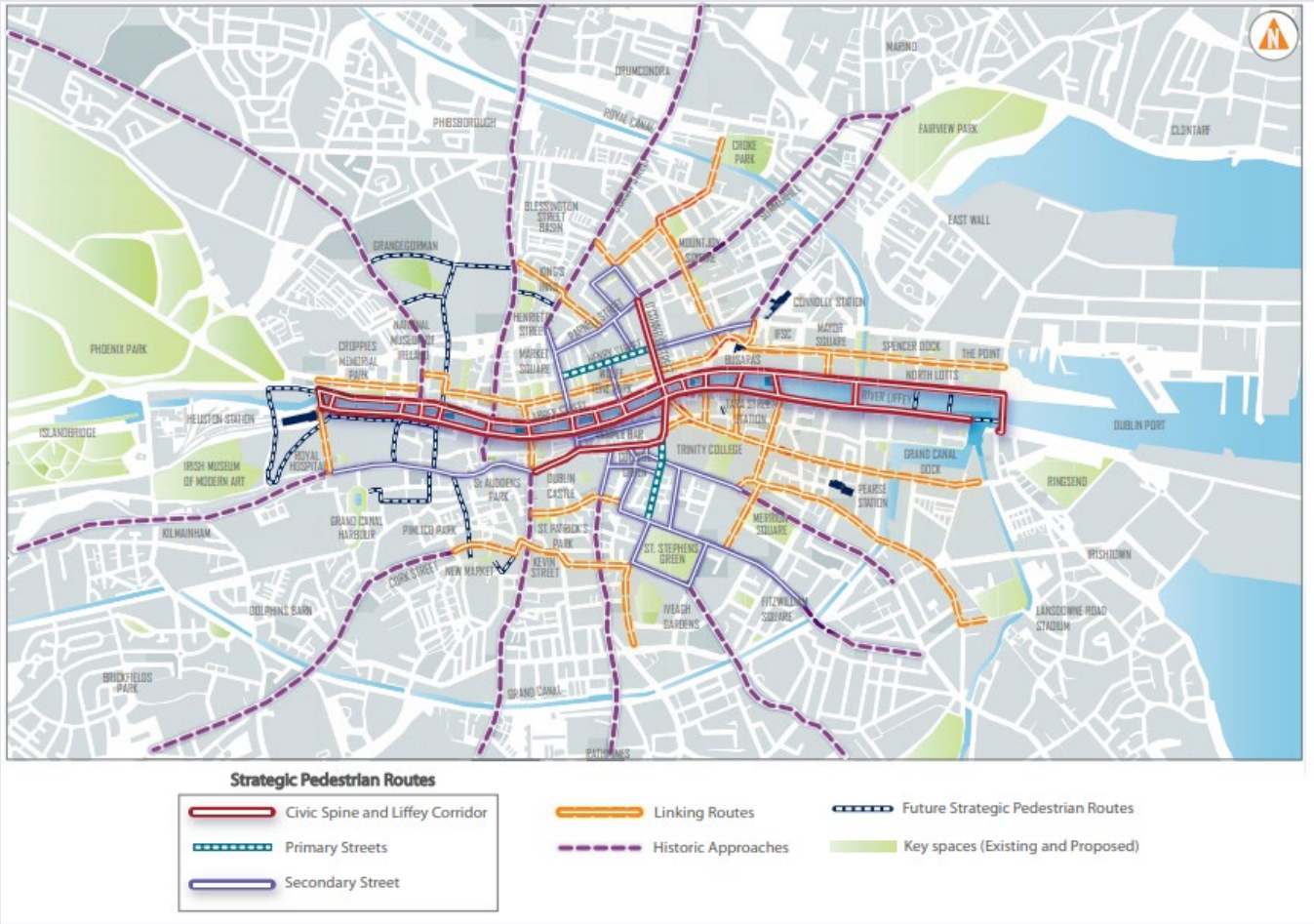

Diagram 9.10: DCC Pedestrian Street Hierarchy (Source: DCC 2016b)

Table 9.36 presents pedestrian routes within the Project's study area that have been identified as having 'Very High' or 'High' significance in the baseline scenario, and their associated DCC Pedestrian Street Hierarchy categorization.

Table 9.36: Key Pedestrian Streets within Project's study area

Link	**DCC** Pedestrian Street Hierarchy	Significance	Nearest Station
R125 Watery Lane	N/A- Fingal County Council	High	Estuary
Broad Meadow River Informal Walking Route	N/A- Fingal County Council	High	Estuary
R106 Swords Road	N/A- Fingal County Council	High	Swords Central
R125 Airside Retail Park	N/A- Fingal County Council	High	Fosterstown
Fosterstown Masterplan Lands	N/A- Fingal County Council	High	Fosterstown
Estuary West Masterplan Lands	N/A- Fingal County Council	High	Estuary
Barrysparks and Crowscastle Masterplan lands	N/A- Fingal County Council	High	Swords Central
Dublin Airport Internal Pedestrian Network	N/A- Fingal County Council	High	Dublin Airport
Northwood Avenue	N/A- Fingal County Council	High	Northwood
R108 Ballymun Road	Historic Approach	High	R108 Stations (Ballymun, Collins Avenue, Griffith Park, Glasnevin)
R108 Prospect Road	Historic Approach	High	Glasnevin
R135 Finglas Road	No Designation	High	Glasnevin
Whitworth Road	No Designation	High	Glasnevin
O'Connell Street	Civic Spine and Liffey Corridor	Very High	O'Connell Street
R803 Parnell Street	Secondary Route	Very High	O'Connell Street
Frederick Street North	Secondary Route	Very High	O'Connell Street
Henry Street	Primary Route	Very High	O'Connell Street
R802 Tara Street	Linking Route	High	Tara Street
R105/R138 George's Quay	Civic Spine and Liffey Corridor	Very High	Tara Street
St Stephen's Green (all)	Secondary Route	Very High	St Stephen's Green
R138 Merrion Row	Secondary Route	Very High	St Stephen's Green
Merrion Street Upper	Linking Route	High	St Stephen's Green
Grafton Street	Primary Route	Very High	St Stephen's Green
R111 Grand Parade	No Designation	High	Charlemont
R117 Ranelagh Road	No Designation	High	Charlemont

9.5.1.5 Cycle Network

In conjunction with the seven local authorities comprising the GDA, the GDA Cycle Network (NTA 2013) identifies:

- The Urban Cycle Network at the Primary, Secondary and Feeder level;
- The Inter-Urban Cycle Network linking the relevant sections of the Urban Network and including the elements of the National Cycle Network, including linkages to key transport locations outside of urban areas such as airports and ports; and
- The Green Route Network being cycle routes developed predominantly for tourist, recreational and leisure purposes.

The cycle network consists of the Dublin Bike stations, on-street cycle parking, as well as dedicated off-street cycle parking, such as the facilities on Drury Street in Dublin City Centre.

Figure 9.3 presents the overall GDA Cycle Network (2013) in the immediate vicinity of the proposed Project, with Table 9.37 providing a summary of the key cycle links within the study area.

Further details on the baseline conditions at each station are presented in the following sections. The future receiving environment for each of the user classes (public transport users, road users, pedestrians and cyclists) will also be detailed. As highlighted in section 9.4.8.2.1.3, a Draft GDA Cycle Network Plan (2021) has been prepared as part of the Draft GDA Transport Strategy 2022-2042. The categorisation of routes remains largely the same, with the addition of 'Primary Radial' and 'Primary Orbital' routes as part of the strategic network.

Table 9.37: GDA Cycle Network Categories within Study Area

Link	GDA Cycle Network Category (2013)	Draft GDA Cycle Network Category (2021)	Nearest Station
R132 Lissenhall Junction	Inter-Urban Route	Secondary Route	Estuary
R132 Swords Bypass	No Designation	No Designation at Seatown, Secondary Route at Swords Central and Primary Radial at Fosterstown	Estuary/Seatown/Swords Central/Fosterstown/Dublin Airport
R106 Swords Road	Primary/Secondary Route	Primary Orbital Route	Swords Central
R125 Airside Retail Park	Primary/Secondary Route	Secondary Route	Fosterstown
R108 Prospect Road	Primary Route	Primary Radial Route	Glasnevin
O'Connell Street	Primary Route	Primary Orbital Route	O'Connell Street
R802 Tara Street	South Core City Centre- No Designated routes	South Core City Centre- No Designated routes	Tara Station
R118 Pearse Street	Secondary Route	Primary Orbital Route	Tara Station
St Stephen's Green North	Feeder Route	Primary Orbital Route	St Stephen's Green
St Stephen's Green East/South/West	Primary Route	Primary Radial Routes on East and West, Secondary Route on South	St Stephen's Green
R138 Leeson Street	Primary Route	Primary Radial Route	St Stephen's Green
Grand Canal	Secondary Route	Secondary Route	Charlemont

9.5.2 Local Level Baseline Conditions

This section will detail the baseline conditions at the local level of each station from north to south along the alignment. The proposed station locations are presented in Figure 9.4. For each station, the existing conditions are described, as well as noting the future receiving environment of each network before the proposed Project is implemented, acknowledging that this may differ from the baseline conditions in some cases, for example if there are planned changes to the road network in the short-term before the

Project is constructed. As such, the 'future receiving environment' does not relate to either Scenario A or Scenario B, but rather the baseline conditions before the Project is constructed, if they are planned to change from existing conditions at the time of writing this report. In line with the 'Typical Standards of Description of Baseline Data for use in an EIAR' (EPA 2022), the context, character, significance and sensitivity of the baseline conditions have been described.

For each station, the baseline conditions (both existing and future receiving environment, as described above) have been detailed for each of the networks:

- Public Transport Network;
- Road Network;
- Pedestrian Network;
- Cycle Network; and
- Parking and Loading.

9.5.2.1 AZ1 Northern Section

This section of the chapter presents a description of the baseline conditions (and future receiving environment) of the AZ1 Northern Section (Estuary to DANP). The stations within this section include:

- Estuary Station and Park and Ride Facility;
- Seatown Station;
- Swords Central Station; and
- Fosterstown Station.

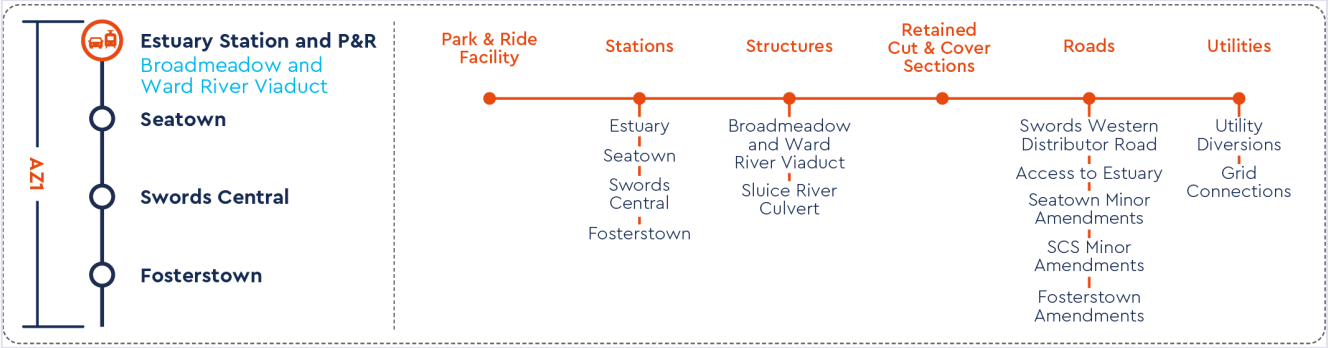

Diagram 9.11: AZ1 Location and Features

Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

2016 CSO data[1]on 'Population aged 5 years and over by means of travel to work' indicates that in AZ1 Northern Section, Road has the largest mode share of approximately 61%, followed by PT which holds approximately 22% mode share. Active modes represent a total of approximately 18% mode share. Diagram 9.12 illustrates the modal split in the AZ1 Northern Section in 2016.

[1] Whilst a 2022 CSO Census has been undertaken, the results are in a 'preliminary' stage and therefore have not been included in this assessment.

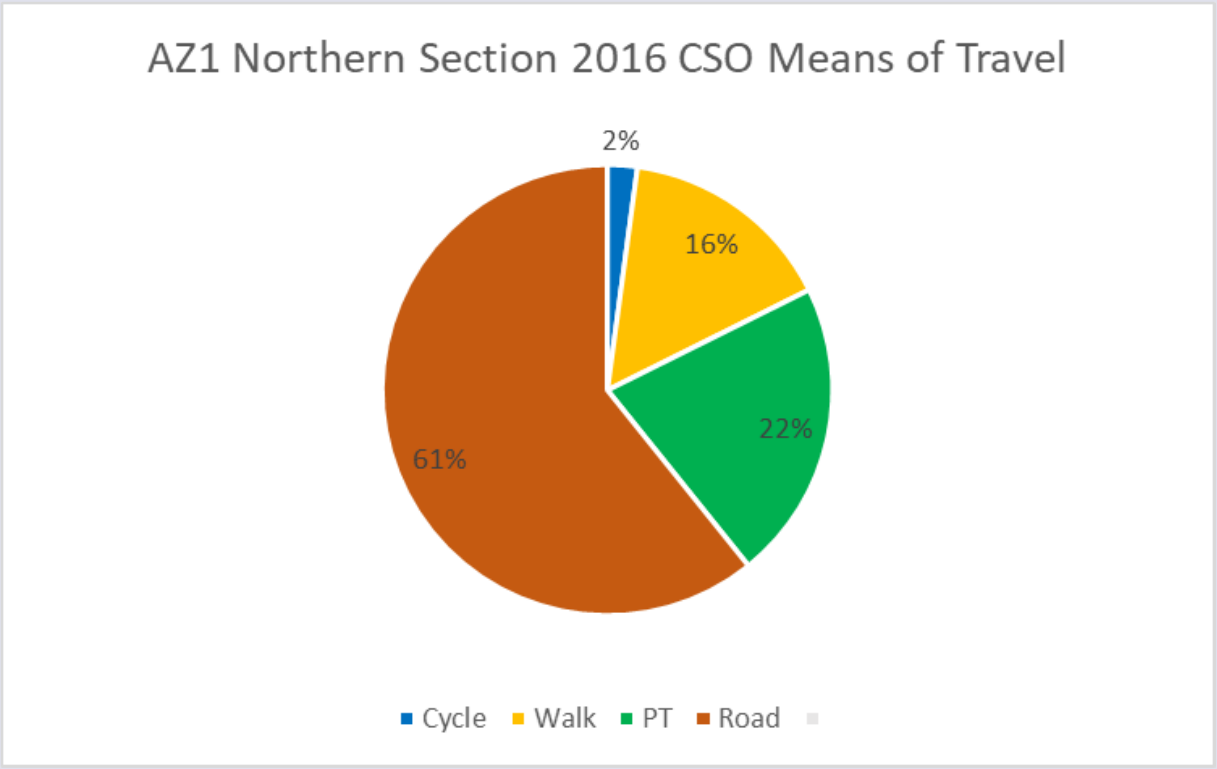

Diagram 9.12: AZ1 Northern Section CSO 2016 Means of Travel

Table 9.38 presents the travel patterns in AZ1 Northern Section in the future Do Minimum scenarios in 2035, 2050 and 2065. The data has been extracted from model runs undertaken using the ERM and represents a 2km catchment from the alignment. The change in travel patterns in the study area during the Operational Phase is presented in Section 9.6.2.2 Local Level Impacts.

Table 9.38: Travel Characteristics of AZ1 Northern Section

AZ1	Scenario A Do Min			Scenario B Do Min		
	2035	2050	2065	2035	2050	2065
Cycle	1,703 (1%)	2,305 (2%)	3,101 (2%)	1,640 (1%)	2,246 (2%)	2,972 (2%)
Walk	23,536 (20%)	28,531 (21%)	34,531 (23%)	23,385 (20%)	28,405 (21%)	34,155 (22%)
Metro Only	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
PT	15,164 (13%)	17,930 (13%)	21,321 (14%)	15,040 (13%)	17,826 (13%)	21,249 (14%)
Road	75,676 (65%)	85,450 (64%)	93,642 (61%)	76,416 (66%)	86,135 (64%)	94,532 (62%)
Total	116,079	134,216	152,595	116,481	134,611	152,908

Diagram 9.13 presents the percentage mode share in the AZ1 Northern Section in the Do Minimum scenario, in both Scenario A and Scenario B for all years. Car mode share decreases in both Scenario A and Scenario B from 66% in 2035, to 62% in 2065 in Scenario B. PT mode share reaches approximately 14% in 2065 in both Scenario A and Scenario B.

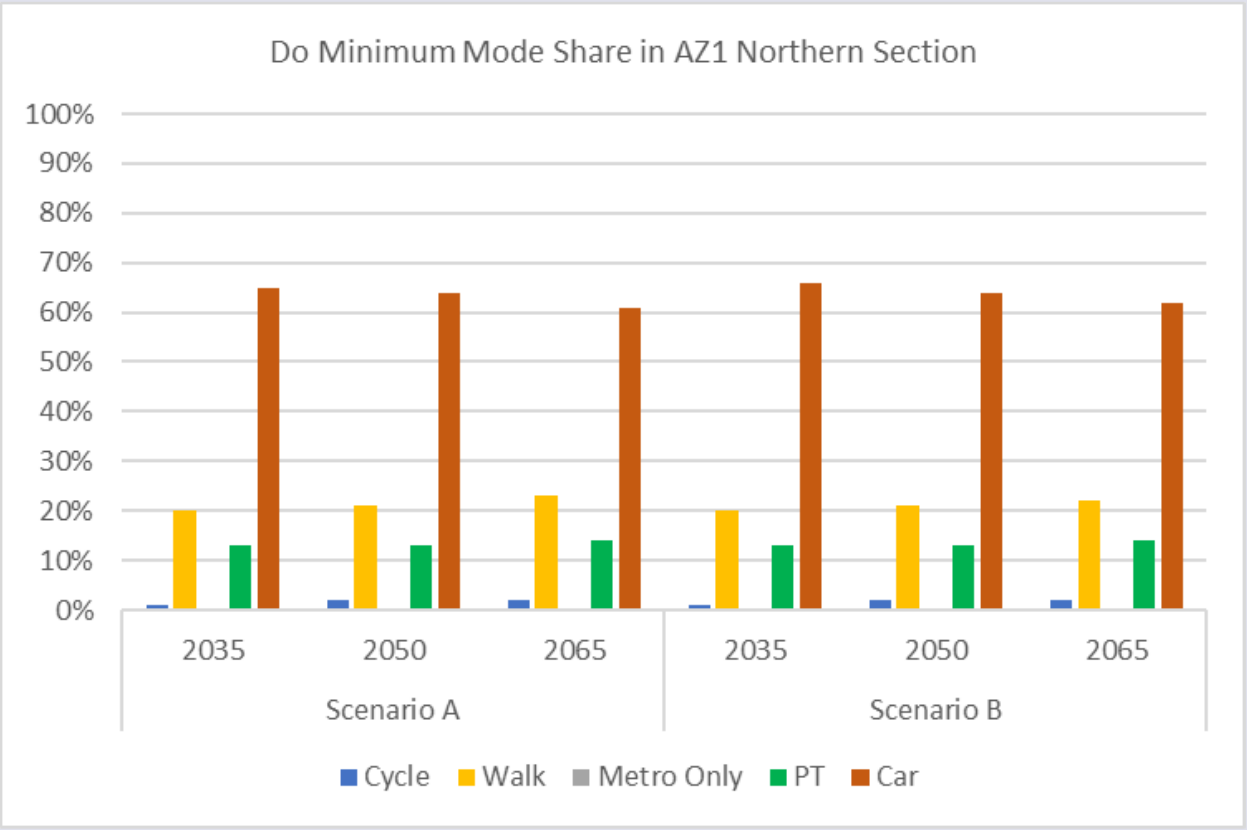

Diagram 9.13: Do Minimum Mode Share in AZ1 Northern Section

9.5.2.1.1 Existing Public Transport Network

The Swords Express Service operates within AZ1 Northern Section as a private commercial service offering an express connection between the Swords area and Dublin Airport and Dublin City Centre. However, Dublin Bus services in this area such as route 33 (Balbriggan to Dublin Airport and Lower Abbey Street) or route 41 (to Lower Abbey Street) offer a limited or peak-only services, with a frequency of approximately every 60 minutes or less.

The DART Northern Coastal Line serves areas to the east of the alignment such as Donabate, Malahide and Howth. Figure 9.5 illustrates the locations of all public transport facilities within 600m of each station.

9.5.2.1.1.1 Future Receiving Network – Public Transport

As part of the Bus Network Redesign proposals, the A Spine will serve Swords Main Street, offering a high frequency service to Dublin City Centre. The area will also be served by a number of local routes, Other City Bound Routes and Peak Only routes.

These services provide a range of significance (from Low to Very High) and sensitivity (from Negligible to High). Table 9.39 presents a summary of both the existing public transport network and the future receiving environment in AZ1 Northern Section.

Table 9.39: Summary of the Public Transport Network in AZ1 Northern Section

Link	Status	Significance	Sensitivity	Comment
Swords Express 500(x), 501 (x) 503, 505 (x), 506(x) 507	Existing Network	Very High	High	Express Service
Route 33 Balbriggan towards Lower Abbey Street	Existing Network	Low	Negligible	Limited or Peak Only Route
Route 33a Balbriggan/ Skerries towards Dublin Airport	Existing Network	Low	Negligible	Service every 60mins
Route 33b Portrane towards Swords	Existing Network	Medium	Low	Service every 30mins
Route 43 to Talbot Street	Existing Network	Low	Negligible	Limited or Peak Only service (every 60mins)
41 (x) to Lower Abbey Street	Existing Network	Low	Negligible	Limited or Peak only service
41b to Lower Abbey Street	Existing Network	Low	Negligible	Limited or Peak only service
41 and 41c combined	Existing Network	High	Medium	41 along is every 20-25mins, however combined it is every 9mins
101 to Dublin Busaras	Existing Network	Low	Negligible	Limited or Peak only service
101x to Wilton Terrace	Existing Network	Low	Negligible	Limited or Peak only service
Bus Network Redesign A Spine	Future Receiving Environment	Very High	High	High frequency
Bus Network Redesign Local Routes 81, 82, 83, 85 and 89	Future Receiving Environment	Medium	Low	Local Route
Bus Network Redesign Other City Bound routes 21 and 22	Future Receiving Environment	High	Medium	Other City Bound Route
Bus Network Redesign Peak Only Route X79	Future Receiving Environment	Low	Negligible	Peak Only
Bus Network Redesign Peak only route X84	Future Receiving Environment	Low	Negligible	Low frequency route

In the Do Minimum Scenario A and Scenario B 2035 AM peak hour, journeys from Drogheda to Dublin City Centre locations such as O'Connell Street, St Stephen's Green and Trinity College Dublin take up to 2 hours in Scenario A and approximately 1h hour and 40 minutes in Scenario B. Public transport journeys from the Swords area to these same locations take between 45 and 60 minutes in both scenarios.

9.5.2.1.2 Existing Road Network

Figure 9.6 illustrates the existing road network around each of the stations. The AZ1 Northern Section closely follows the current alignment of the R132 Swords Bypass southbound and is bound by the M1 to the east. The M1 links Dublin to Belfast, and TII traffic counters (detailed in Data Collection Report

Appendix A9.6) to the north of Junction 4 (Lissenhall/Donabate) and Junction 5 (Balbriggan South) indicate an average daily flow of approximately 60,000 vehicles in 2019 (pre-COVID levels). The M1 Junction 4 at Lissenhall comprises of a roundabout to the north (hybrid with signalised elements) and a cut-through roundabout to the south (roundabout with through-road).

Other key regional roads in the area include the R125 Airside Retail Park, R836 Swords Main Street and R106 Swords Road, which interact with all proposed stations in this section. From the M1, the R132 Swords Bypass is accessed via the Lissenhall junction.

The Donabate Distributor Road opened as of March 2020, running in an easterly direction from the R126 Hearse Road on the south-west of Donabate village, across the Dublin-Belfast railway line, before heading in a northerly direction to reconnect with the R126 on the Portrane Road. The new 4km road alleviates traffic at Donabate village and provide alternative access to Portrane and the eastern parts of Donabate. Footpaths and off-road cycle facilities are also included along the extents of the road.

9.5.2.1.2.1 Future Receiving Environment – Road Network

The Swords Western Relief Road (SWRR) is an objective of the Fingal Development Plan 2017-2023 (FCC 2017a), which is proposed to connect the R132 Swords Bypass north of the M1 Lissenhall junction and proceeds for approximately 9km through rural Fingal to the N2 north of the M50 Motorway. The SWRR 'could remove significant volumes of traffic from the Swords Town Centre area, as well as serving strategic traffic between the M1 and M2/M50 Motorway corridors.' It could also 'serve the proposed strategic park and ride, minimising the amount of traffic utilising limited carrying capacity on the existing and proposed local road network in Swords.'

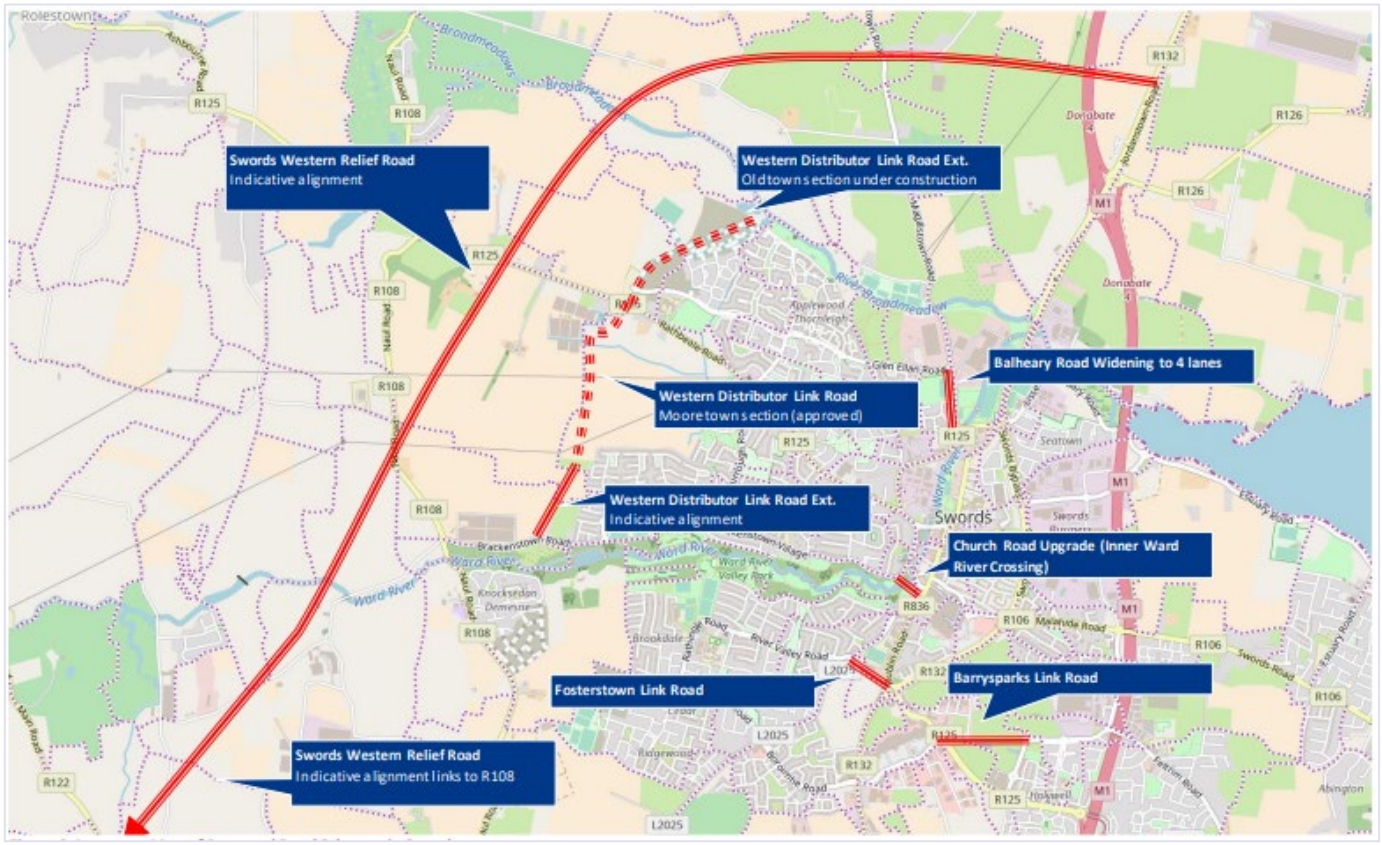

Diagram 9.14: Indicative Alignment of Swords Western Relief Road (FCC 2019b)

FCC, in conjunction with the NTA, seek to improve connectivity for pedestrians and cyclists along the R132 Swords Bypass by implementing signalised junctions at the current Malahide Road Roundabout, Seatown Road Roundabout and Estuary Roundabout. This scheme is referred to as the R132 Connectivity Project.

The main vehicular access to the Fosterstown Masterplan lands will be via the new Fosterstown Link Road from the R132 Swords Bypass to the Forest Road, as shown in Diagram 9.15. The Pinnock Hill Roundabout on the R132 Swords Bypass will be upgraded to accommodate the new link road.

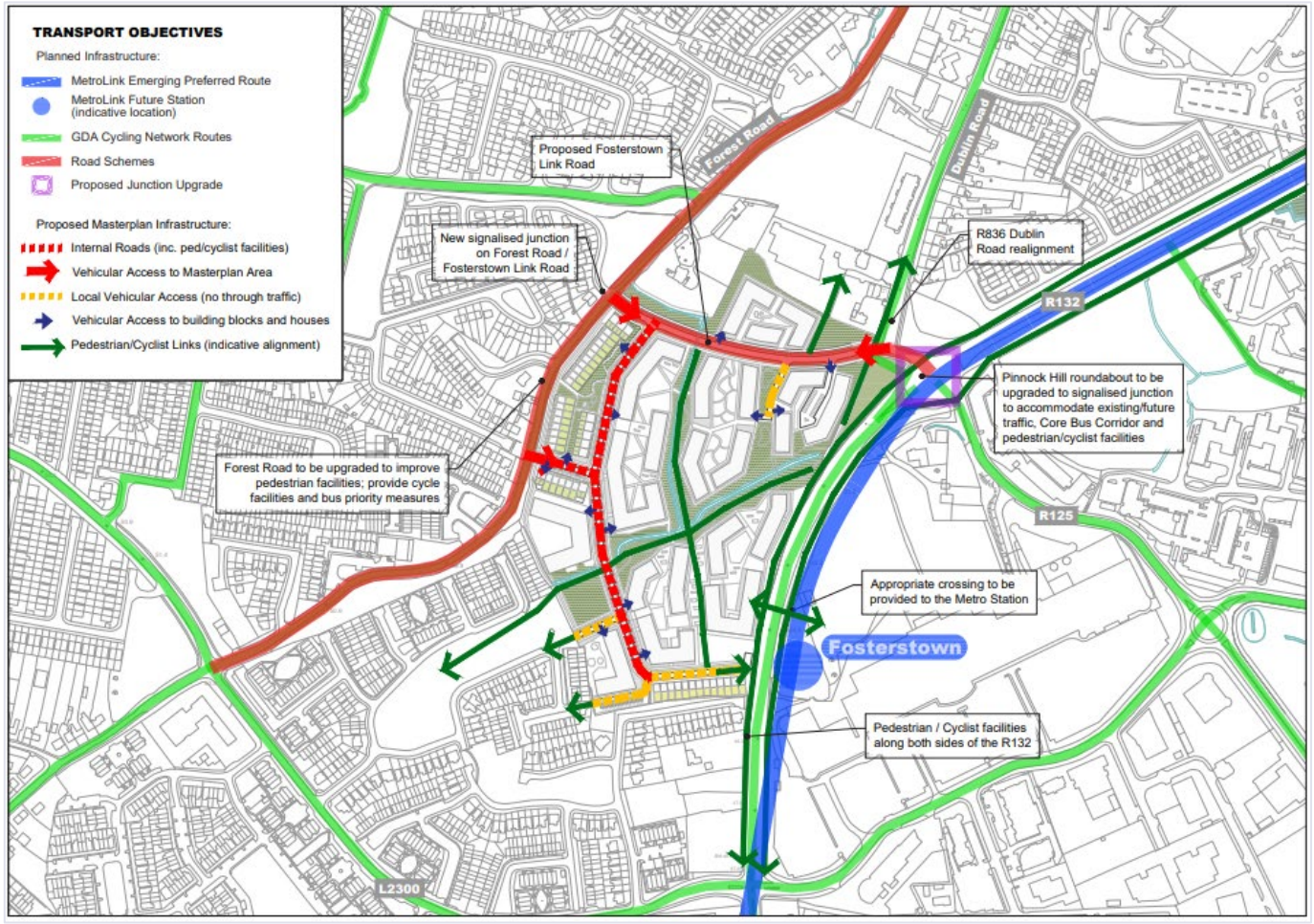

Diagram 9.15: Transport Objectives of Fosterstown Masterplan Lands (FCC 2019a)

Table 9.40 presents an overview of both the existing road network and the future receiving environment. within AZ1 Northern Section, illustrating the range in significance and sensitivity of the road network in this section. The significance of the network varies from Low to Very High, and the sensitivity varies from Low to High. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.40: Summary of Road Provisions in AZ1 Northern Section

Link	Status	Significance	Sensitivity	Comment
M1	Existing Network	Very High	Low	Part of strategic road network but has limited sensitive receptors nearby
R132 Swords Bypass	Existing Network	Medium	Medium	Regional Road
R106 Malahide Road/ Swords Road	Existing Network	Medium	Medium	Regional Road
R125 Airside Retail Park	Existing Network	Medium	Medium	Regional Road
R836 Swords Main Street	Existing Network	Medium	Medium	Regional Road
Ennis Lane	Existing Network	Low	High	Local Road
L2300 Boroimhe Road	Existing Network	Low	High	Local Road
L2305 Nevinstown Lane	Existing Network	Low	High	Local Road
SWDR	Future Receiving Environment	High	Medium	Equivalent of Regional Road
Fosterstown Link Road	Future Receiving Environment	Low	High	Local Road

9.5.2.1.3 Existing Pedestrian Network

At M1 Lissenhall Junction, there is an existing pedestrian underpass connecting the R132 Swords Bypass (north and south of the junction) and the R126 Hearse Road. However, south of the Lissenhall Junction there are limited pedestrian facilities along the R132 Swords Bypass. A pedestrian overpass is present over the R132 Swords Bypass, from the R125 to Seatown West. A pedestrian footbridge is also present over R132 Swords Bypass north of Seatown Roundabout, at Chapel Lane, and on the south side of Malahide Road Roundabout, providing a link from Pavillions Shopping Centre and the Town Centre to proposed station. The significance and sensitivity of the pedestrian network varies from Low to High.

As the AZ1 Northern Section lies within FCC bounds, the footway provisions have not been assessed against the DCC pedestrian comfort guidance, however the assessment against the TfL Pedestrian Comfort Calculator has been undertaken at all stations except for Estuary where there are no existing pedestrian footways on the R132 at this location. Survey data was not collected in close proximity to Ennis Lane, however due to the limited nearby facilities, it has been assumed that the pedestrian demand at this location is very low. At Seatown Station, all links are deemed 'Comfortable' for the minimal volumes of existing pedestrian demand, with the exception of the footways on the R132 which are deemed 'Uncomfortable' due to their restricted width of 1.3m. At Swords Central, the footways on the R132 Swords Bypass and Drynam Road are deemed 'Uncomfortable' due to their restricted widths of below 2m. The R106 Malahide Road and Dublin Road are considered to be 'Comfortable' for the existing pedestrian demand. At Fosterstown, all links are deemed to be 'Comfortable', with the exception of the R125 Airside due to the restricted 1m wide footway on one side of the road only.

9.5.2.1.3.1 Future Receiving Environment- Pedestrian Network

When the R132 Connectivity Project is implemented, there will be improved pedestrian facilities along the R132 through the realignment of the Estuary Roundabout, Seatown Road Roundabout and Malahide Road Roundabout to signalised junctions, as well as the provision of pedestrian crossings at Chapel Lane, north of Estuary Roundabout, and north of Pinnock Hill Roundabout.

As identified in the Oldtown/Mooretown Local Area Plan (LAP), accessibility in the Ward River area will be improved in the future with the development of the Swords Western Distributor Road (SWDR), which will form a spine of access to both Oldtown and Mooretown. The SWDR will 'comprise a safe and attractive pedestrian/cyclist green corridor to facilitate access to the Ward River Valley Park, thereby ensuring connectivity to the wider green network of open spaces' (FCC 2019b, p17).

The lands to the south-west of the station, between Glen Ellan Road and Balheary Road, are zoned for development under the Estuary West Masterplan. It is envisaged that 'Estuary West will become a vibrant residential and mixed-use community, with active and friendly streetscapes', including a proposal for a pedestrian/cyclist connection between the lands and Estuary Station. This will improve permeability along and across the Broadmeadow River.

As part of the Barrysparks and Crowscastle Masterplan, there are a number of green infrastructure objectives for the Masterplan lands, including providing a central north-south green corridor encompassing pedestrian and cyclist infrastructure and both active and passive open space amenities connecting from the R125 to the south of the site to the R132 Swords Bypass to the north. A pedestrian and cyclist connection will also be provided from the proposed central spine to the existing open space area at Holywell Avenue to facilitate movements to the Pavillions, Swords Main Street and into a redesigned Ward River Valley Park as set out in Swords Masterplan 2009.

The Fosterstown Masterplan Lands also seek to facilitate strong pedestrian and cyclist connections, as well as strong connections to the town centre and public transport infrastructure. The masterplan also incorporates pedestrian and cyclist connections to facilitate access to the proposed Fosterstown Station and Swords Main Street.

Table 9.41 presents a summary of the existing pedestrian network within AZ1 Northern section, and the future receiving environment. Whilst there are limited pedestrian facilities in the area, the proximity to both Swords Town Centre and Airside Retail Park increases the significance and sensitivity of these facilities. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.41: Summary of Pedestrian Provisions in AZ1 Northern Section

Link	Status	Significance	Sensitivity	Comment
R132 Underpass	Existing Network	Low	Low	Limited pedestrians in area
R132 Swords Bypass	Existing Network	Low	Low	Limited pedestrians in area
R125 Watery Lane	Existing Network	High	High	Proximity to Swords Town Centre
Swords Business Park	Existing Network	Low	Low	Industrial Estate area
R132 Footbridge	Existing Network	High	High	Proximity to Swords Town Centre
Drynam Road	Existing Network	Medium	Medium	Residential suburban area
R106 Swords Road	Existing Network	High	High	Proximity to Swords Town Centre
R125 Airside Retail Park	Existing Network	High	High	Proximity to Airside Retail Park
L2300 Boroimhe Road	Existing Network	Medium	High	Proximity to Airside Retail Park
SWDR Green Corridor	Future Receiving Environment	Medium	Medium	Proximity to residential areas

Link	Status	Significance	Sensitivity	Comment
Broadmeadow River	Future Receiving Environment	High	High	Proximity to Swords Town Centre and proposed station
Fosterstown Masterplan Lands	Future Receiving Environment	High	High	Proximity to Airside Retail Park
Estuary West Masterplan	Future Receiving Environment	High	Medium	Proximity to residential areas
Barrysparks and Crowscastle Masterplan	Future Receiving Environment	High	High	Proximity to Swords Town Centre and proposed station

9.5.2.1.4 Existing Cycle Network

Figure 9.7 illustrates the GDA Cycle Network in the vicinity of the stations. The cycle network in this area consists of mainly Secondary Routes and the Feeder Network, with a Greenway present along the Ward River. The R132 Swords Bypass is designated as an Inter Urban Route north of Seatown Road Roundabout, it has no designation south of the Seatown Road Roundabout. There are limited cycle facilities in this section, however bus lanes are present on the R132 Swords Bypass offering a shared use provision with up to a Level B Quality of Service at Seatown and Swords Central, however the provisions surrounding Estuary Station have a Level C Quality of Service due to the percentage of HGVs within the total traffic volume, whilst the provisions near Fosterstown Station have a Level C Quality of Service on the R132 Swords Bypass due to the restricted width of existing cycle lanes to accommodate adjacent cyclists. Nevinstown Lane (Airside) has a Level A Quality of Service. The provisions in this section range in significance and sensitivity (from Low to High) due to the proximity to Swords Town Centre and a number of industrial estates.

9.5.2.1.4.1 Future Receiving Environment- Cycle Network

Improvements to the cycling network as part of the development of the SWDR and the Estuary West Plan, the Barrysparks and Crowscastle Masterplan have been noted in Section 9.5.2.1.3.1 AZ1 Northern Section Pedestrian Network - Receiving Environment.

As part of the R132 Connectivity Project, the realignment of the existing Estuary Roundabout, Seatown Road Roundabout and Malahide Road Roundabout to signalised junctions will provide for designated cycle lanes along the R132, and cycle crossings to improve connectivity across the R132 Swords Bypass. A crossing facility will be provided north of Estuary Roundabout, and north of Pinnock Hill Roundabout.

The BusConnects programme will also amend the Pinnock Hill Roundabout and Nevinstown Junction, providing cycling facilities at these junctions and along the R132 Swords Bypass in this section.

As part of the Draft GDA Cycle Network Plan (2021), the R132 Swords Bypass will be categorised as a Secondary Route in the vicinity of Estuary Station and Swords Central Station. At Seatown Station it will have no categorisation, however it will be considered a Primary Radial Route at Fosterstown. The R106 Swords Road will be categorised as a Primary Orbital Route, as well as the L2300 Boroimhe Road.

Table 9.42 presents a summary of the existing cycle network and future receiving environment in AZ1 Northern Section, illustrating the range in significance and sensitivity of the provisions. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.42: Summary of Cycle Provisions in AZ1 Northern Section

Link	Status	Significance	Sensitivity	Comment
R132 Swords Bypass	Existing Network	Low	Low	Limited nearby facilities/attractions
Donabate Distributor Road	Existing Network	Low	Low	Limited nearby facilities/attractions
R126 Hearse Road	Existing Network	Low	Low	Limited nearby facilities/attractions
R125 Watery Lane	Existing Network	High	High	Proximity to Swords Town Centre
Seatown Road	Existing Network	High	High	Proximity to Swords Town Centre
North Dublin Corporate Park	Existing Network	Low	Low	Industrial estate area
Swords Business Park	Existing Network	Low	Low	Industrial estate area
Airside Retail Park	Existing Network	High	High	Proximity to Airside Retail Park
R125 Airside Retail Park	Existing Network	High	High	Proximity to Airside Retail Park
SWDR Green Corridor	Future Receiving Environment	Low	Low	Limited pedestrians in area
Broadmeadow River	Future Receiving Environment	High	High	Proximity to Swords Town Centre and proposed station
R132	Future Receiving Environment	Medium	Low	Improved facilities will increase usage
BusConnects- R132	Future Receiving Environment	High	High	Improved facilities will increase usage, and proximity to Airside Retail Park
Fosterstown Masterplan Lands	Future Receiving Environment	High	High	Proximity to Airside Retail Park
Estuary West Masterplan	Future Receiving Environment	High	Medium	Proximity to residential areas
Barrysparks and Crowscastle Masterplan	Future Receiving Environment	High	High	Proximity to Swords Town Centre and proposed station

9.5.2.1.5 Existing Parking and Loading

There are no on-street or on-road parking provisions around the proposed Estuary Station, Seatown Station, Swords Central Station. At Fosterstown Station, there are current parking facilities within the Airside Retail Park. There will be no change to the future receiving environment.

Table 9.43 presents a summary of the existing parking conditions within AZ1 Northern Section. The future receiving environment will be the same as the existing conditions. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.43: Summary of Parking Provisions in AZ1 Northern Section

Link	Status	Significance	Sensitivity	Comment
Airside Retail Park	Existing Network	High	High	Retail parking provision

9.5.2.2 AZ2 Airport Section

This section of the chapter presents a description of the baseline conditions (and future receiving environment) of the AZ2 Airport Section (DANP to DASP). This section includes:

- Dublin Airport North Portal;
- Dublin Airport Station; and
- Dublin Airport South Portal.

Diagram 9.16: AZ2 Locations and Features

Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

2016 CSO data on 'Population aged 5 years and over by means of travel to work' indicates that in AZ2 Airport Section, Road has the largest mode share of approximately 68%, followed by PT which holds approximately 23% mode share. Active modes represent a total of approximately 9% mode share. Diagram 9.17 illustrates the modal split in the AZ2 Airport Section in 2016.

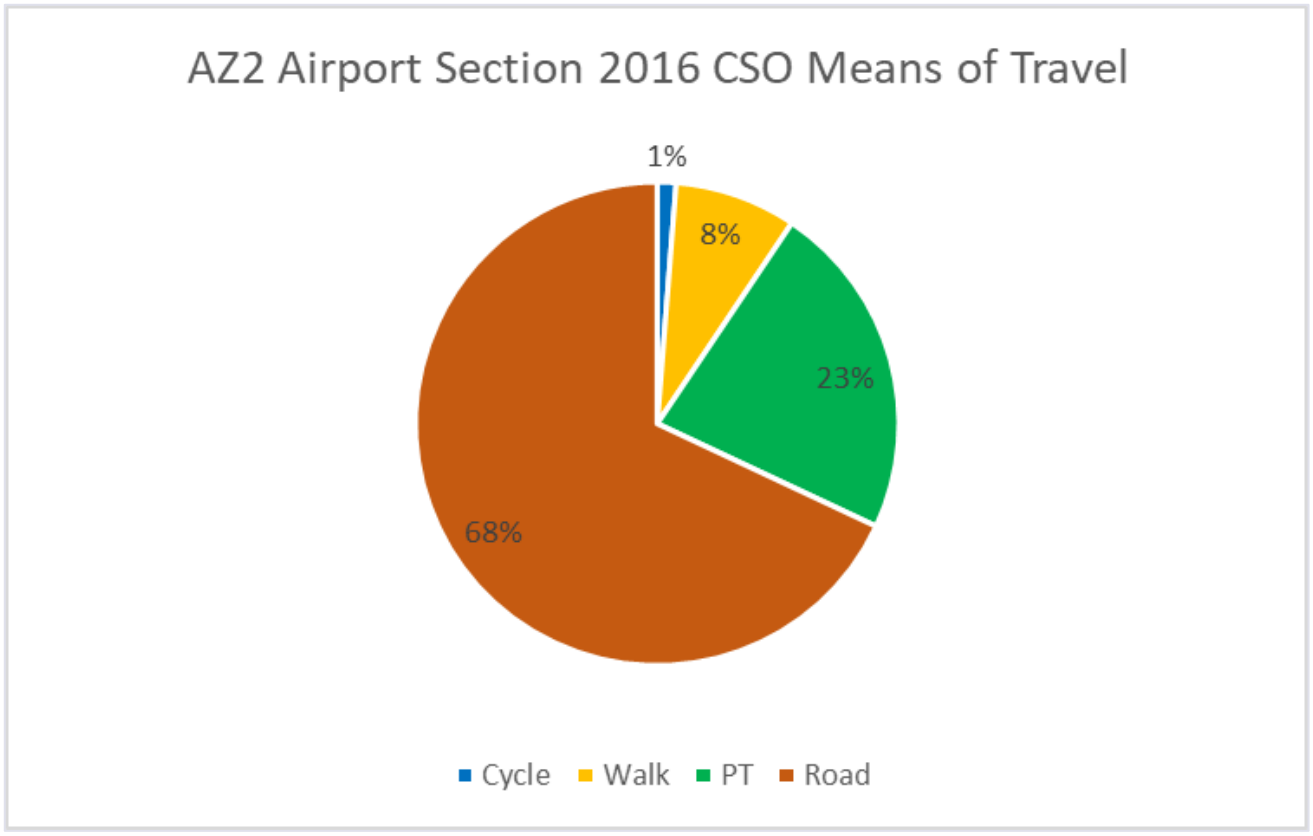

Diagram 9.17: AZ2 Airport Section CSO 2016 Means of Travel

Table 9.44 presents the travel patterns in AZ2 Airport Section in the future Do Minimum scenarios in 2035, 2050 and 2065. The data has been extracted from model runs undertaken using the ERM and represents a 2km catchment from the proposed Project. The change in travel patterns in the study area during the Operational Phase is presented in Section 9.6.2.2 Local Level Impacts.

Table 9.44: Travel Characteristics in AZ2 Airport Section

AZ2	Scenario A Do Min			Scenario B Do Min		
	2035	2050	2065	2035	2050	2065
Cycle	627 (1%)	909 (1%)	1,206 (1%)	632 (1%)	930 (1%)	1,212 (1%)
Walk	807 (1%)	1,172 (1%)	1,565 (2%)	821 (1%)	1,223 (1%)	1,606 (2%)
Metro Only	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
PT	26,146 (36%)	39,637 (45%)	50,306 (50%)	28,144 (39%)	43,229 (49%)	53,100 (52%)
Road	44,119 (62%)	47,200 (53%)	48,440 (48%)	42,647 (59%)	42,806 (49%)	45,324 (45%)
Total	71,699	88,918	101,518	72,244	88,188	101,243

Diagram 9.18 presents the mode share of the AZ2 Airport Section in the Do Minimum scenario in both Scenario A and Scenario B across all years. Car mode share holds the highest mode share in all years, in both scenarios, however it falls from approximately 62% in 2035 to 48% in 2065 in Scenario A, and from 59% in 2035 to 45% in 2065 in Scenario B. PT mode share is higher in AZ2 Airport Section than in AZ1 Northern Section, ranging from 39% in 2035 to 52% in 2065 in Scenario B. Walking and Cycling represent 1% of mode share respectively across all years, in both scenarios, with the exception of in 2065 where Walking reaches 2% mode share in both Scenario A and Scenario B.

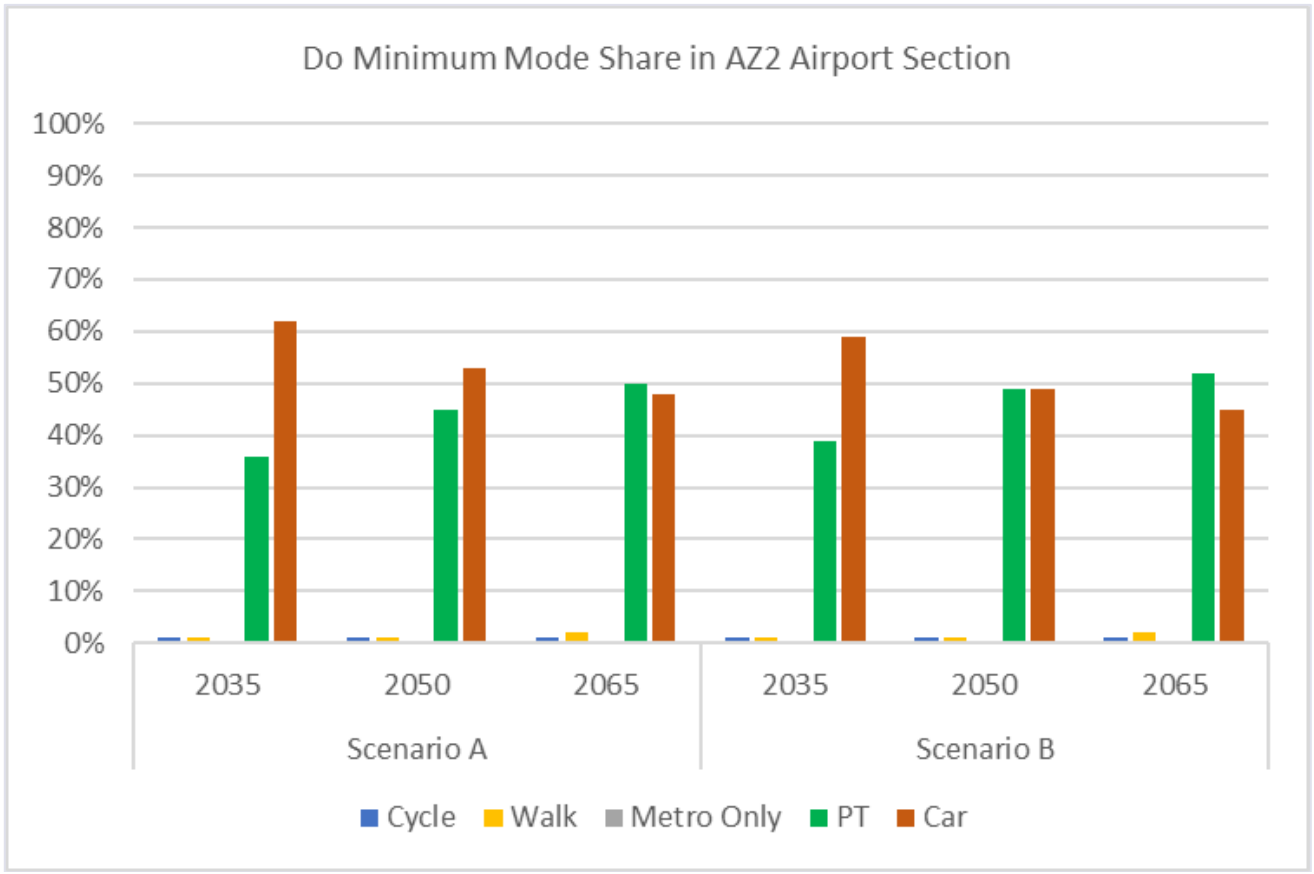

Diagram 9.18: Do Minimum Mode Share in AZ2 Airport Section

9.5.2.2.1 Existing Public Transport Network

The AZ2 Airport section is well-served by the existing bus network, with bus services with frequencies that range from less than every 15 minutes to Peak-Hour only services. Dublin Airport does not have a rail connection, as a result, the bus network in this section varies in significance (from Medium to Very High, and sensitivity (from Low to High). Figure 9.5 illustrates the existing public transport facilities within 600m of the proposed station.

9.5.2.2.1.1 Future Receiving Environment – Public Transport

As part of the Bus Network Redesign proposals, routes A2 (Airport-City Centre-Balinteer-Dundrum) and A4 (Swords-City Centre-Nutgrove) will have frequencies of 10 to 15 minutes on weekdays. Local route 281 (Portmarnock-Malahide-Swords-Airport) will have frequencies of 20 minutes on weekdays, and a frequency of 30 minutes on weekends. Other City-Bound routes 8 (Airport- Charlestown-Ballygall Road-Merrion Square) will have a frequency of 20 minutes on weekdays, with route 82 (Glen Ellan Rd- River Valley-City Centre) having a frequency of every 15 minutes on weekdays.

Table 9.45 presents a summary of the existing public transport network and the future receiving environment in AZ2 Airport Section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.45: Summary of Public Transport Provisions in AZ2 Airport Section

com	Status	Significance	Sensitivity	Comment
Multiple services	Existing Network	High	High	Range from Peak hour to less than 15min frequencies
Bus Network Redesign Spine Routes A	Future Receiving Environment	Very High	High	High Frequency
Bus Network Redesign Other City Bound Routes 19 and 24	Future Receiving Environment	High	Medium	High Frequency
Bus Network Redesign Local Routes 81, 83, 85	Future Receiving Environment	Medium	Low	Local route
Bus Network Redesign Orbital Route N8	Future Receiving Environment	Very High	High	High Frequency

In the Do Minimum Scenario A 2035 AM peak hour, public transport journeys from Balbriggan to Dublin Airport can take approximately 1 hour 30 minutes. From Dublin City Centre locations such as O'Connell Street and St Stephen's Green, public transport journeys to Dublin Airport can take between 45minutes and 55minutes. In Scenario B 2035, these same journeys are between 43 and 52 minutes as result of the enhancements to the network following the build out of the National Development Plan and GDA Strategy.

9.5.2.2.2 Existing Road Network

The AZ2 Dublin Airport Section is bound by the M1 to the east and the N2 to the west, and a network of regional roads such as the R132 Swords Bypass to the east, R108 Ballymun Road to the north and south. The M50 Motorway also lies to the south of the section. Naul Road connects onto the R132 Swords Bypass through a roundabout located approximately 400m to the east of the DANP site. The DASP Construction Compound will be located to the south of Dublin Airport, between Old Airport Road and the M50 Motorway. Figure 9.2 presents the existing road network around Dublin Airport.

The road network in the vicinity of the Dublin Airport Station includes the internal and the external road network. The external network consists of the M1 and M50 Motorway, which are part of the TEN-T network, facilitating vehicular connections with strategic national transport corridors. These are considered to be roads of negligible sensitivity.

The internal network of the Airport is a one-way traffic circulation system that broadly features an outer loop serving T1 departures and surface car park, and an inner loop serving T2 departures and surface car park were the Dublin Airport Station is located. The internal network connects to the external road network at three locations: at the junction of the R132 Swords Bypass and the M1, i.e. the Airport Roundabout; at the junction of Corballis Road South and the R132; and via a minor access point from the Naul Road just west of the Cloghran Roundabout.

9.5.2.2.2.1 Future Receiving Environment – Road Network

DAA has received planning approval for the creation of a paid drop-off area for both Terminal 1 and Terminal 2. The proposed exit from the paid drop-off facility involves changes to the existing road layout and the relocation of a pedestrian crossing.

Table 9.46 presents a summary of the existing and future receiving road network in AZ2 Airport Section. The future receiving environment is not presented as this will remain unchanged. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.46: Summary of Road Provisions in AZ2 Airport Section

Link	Status	Significance	Sensitivity	Comment
M1 Motorway	Existing Network	Very High	Low	Strategic road network but limited sensitive receptors nearby
M50 Motorway	Existing Network	Very High	Low	Strategic road network but limited sensitive receptors nearby
R132 Swords Bypass	Existing Network	Medium	Medium	Regional Road
Dublin Airport Internal Network	Future Receiving Environment	Low	High	Internal Network- change to road network following development of drop-off area

9.5.2.2.3 Existing Pedestrian Network

The existing pedestrian network inside Dublin Airport facilitates the safe movement of pedestrians between the terminals and the car parks, taxi ranks and bus stops. Pedestrian paths are usually accompanied by grass verges or poles that function as barriers between pedestrians and motorised traffic. Similarly, there are zebra crossings present which have tactile pavement, providing for safe crossings. There are also pedestrian fences along the boundaries of footways, segregating pedestrians and vehicular traffic.

An enclosed walkway is present between Terminal 1 and Terminal 2 and extends to the T2 Surface Car Park. The pedestrian network also allows employees to access offices and service areas, however these footways have restricted access to the public. The pedestrian network around the proposed Dublin Airport Station is considered to be of High sensitivity for pedestrians.

9.5.2.2.3.1 Future Receiving Environment- Pedestrian Network

DAA has received planning approval for the creation of a paid drop-off area for both Terminal 1 and Terminal 2. The proposed exit from the paid drop-off facility involves changes to the existing road layout and the relocation of a pedestrian crossing.

Table 9.47 presents a summary of the existing and future receiving pedestrian network in AZ2 Airport Section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.47: Summary of Pedestrian Provisions within AZ2 Airport Section

Link	Status	Significance	Sensitivity	Comment
All	Existing Network	High	High	Internal Pedestrian Network between terminals and office lands
Pedestrian Crossing to Drop-off Area	Future Receiving Environment	High	High	Relocation of pedestrian crossing to access paid drop-off area

9.5.2.2.4 Existing Cycle Network

Figure 9.7 illustrates Dublin Airport Station in relation to the GDA Cycle Network (2013). Dublin Airport Station is within a cycle network circuit that links the R132 Swords Bypass with Terminal 1, Terminal 2, car parks, bus stops and taxi ranks. This network forms part of the Feeder Network. The R132 alongside Dublin Airport is designated as a Primary route. In most cases, cycle lanes are segregated from traffic. This is considered to be an area of High sensitivity for cyclists with Level B Quality of Service.

9.5.2.2.4.1 Future Receiving Environment- Cycle Network

The future receiving environment of the cycle network will remain unchanged from the baseline scenario.

Table 9.48 presents a summary of the existing cycle network within AZ2 Airport Section. The future receiving environment is not presented as it will remain unchanged. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.48: Summary of Cycle Provisions within AZ2 Airport Section

Link	Status	Significance	Sensitivity	Comment
R132 and Terminals	Existing Network	Low	High	Due to nature of travel to airports this cycle network has low significance

9.5.2.2.5 Existing Parking and Loading Network

The proposed Dublin Airport Station will be situated beneath the Terminal 2 Short Term surface car park.

9.5.2.2.5.1 Future Receiving Environment- Parking and Loading Network

DAA has received planning approval for the creation of a paid drop-off area for both Terminal 1 and Terminal 2. The proposed exit from the paid drop-off facility involves changes to the existing road layout and the relocation of a pedestrian crossing. The use of the Terminal 2 Surface Car Park, and road configurations, tolling infrastructure and all development at the area adjoining the south-west corner of the Terminal 2 multi-storey car park is 'permitted on a temporary basis only and shall cease within five years or the final grant of permission or otherwise where required for purposes of MetroLink.'

Table 9.49 presents a summary of the existing and future receiving parking network in AZ2 Airport Section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.49: Summary of Parking Provisions in AZ2 Airport Section

Link	Status	Significance	Sensitivity	Comment
T2 Short Term Surface Level Car Park	Existing Network	High	High	Internal Airport Parking
Paid Drop-off Facility at T2 Surface Car Park	Future Receiving Environment	High	High	Internal Airport Drop-Off

9.5.2.3 AZ3 Dardistown to Northwood Section

This section of the chapter presents a description of the baseline conditions (and future receiving environment) of the AZ3 Dardistown Section (DASP to Northwood). This section includes:

- Dardistown Depot (proposed future station);
- M50 Viaduct; and
- Northwood (City Tunnel and Station).

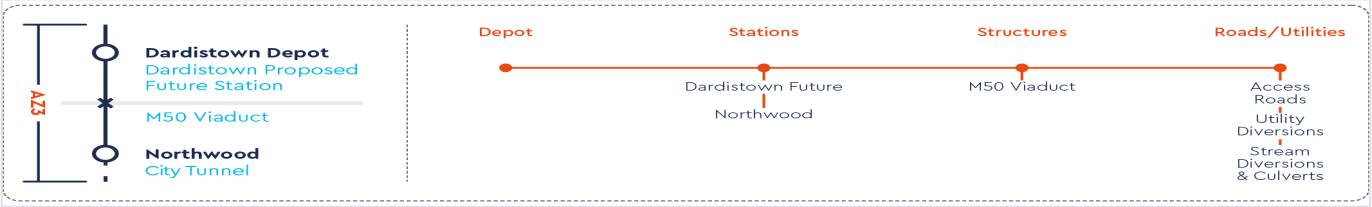

Diagram 9.19: AZ3 Locations and Features

Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

2016 CSO data on 'Population aged 5 years and over by means of travel to work' indicates that in AZ3 Dardistown Depot to Northwood Section, Road has the largest mode share of approximately 67%, followed by Walk which holds approximately 20% mode share. In this geographical section, PT only accounts for approximately 7% mode share, as does Cycling. Diagram 9.20 illustrates the modal split in the AZ3 Dardistown Depot to Northwood Section in 2016.

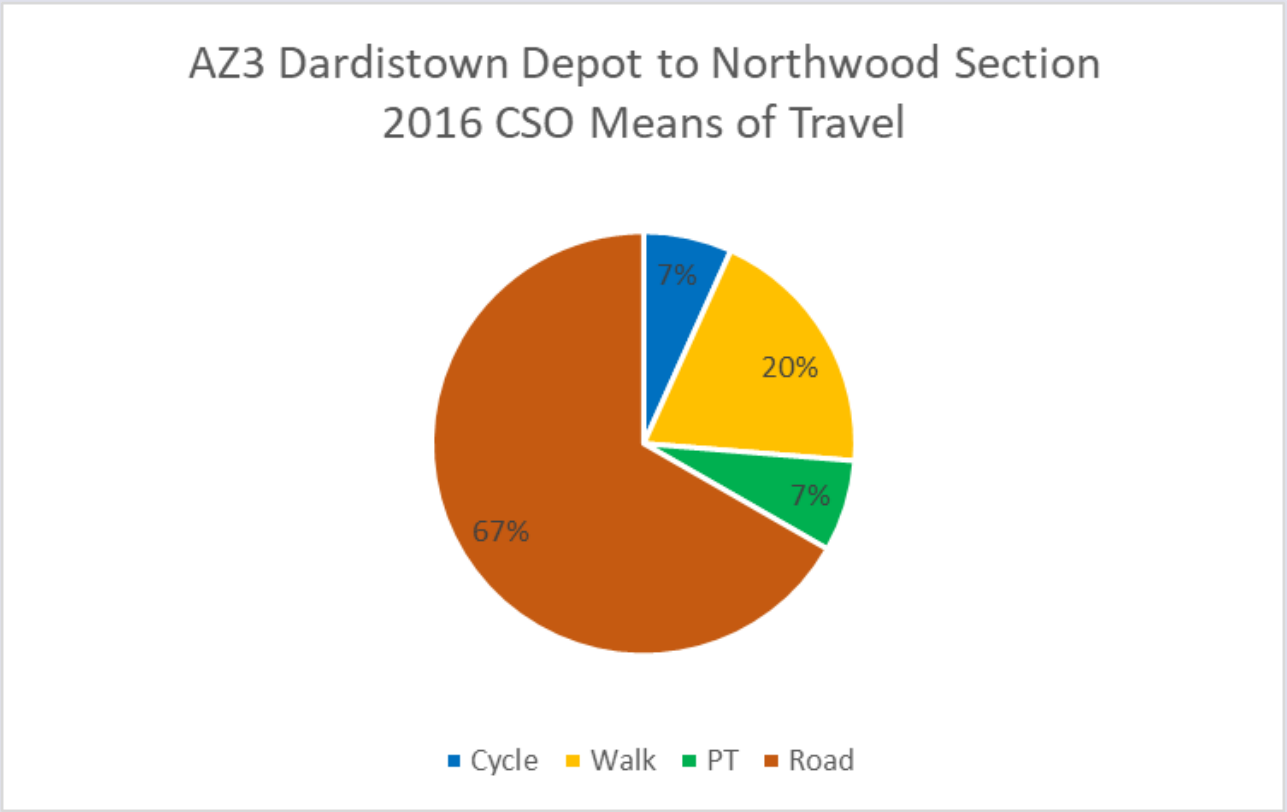

Diagram 9.19: AZ3 Dardistown Depot to Northwood Section CSO 2016 Means of Travel

Table 9.50 presents the travel patterns in AZ3 Dardistown to Northwood Section in the future Do Minimum scenarios in 2035, 2050 and 2065. The data has been extracted from model runs undertaken using the ERM and represents a 2km catchment from the alignment. The change in travel patterns in the study area during the Operational Phase is presented in Section 9.6.2.2 Local Level Impacts.

Table 9.50: Travel Characteristics in AZ3 Dardistown to Northwood

AZ3	Scenario A Do Min			Scenario B Do Min		
	2035	2050	2065	2035	2050	2065
Cycle	521 (4%)	702 (4%)	896 (5%)	504 (4%)	663 (4%)	842 (4%)
Walk	3,251 (24%)	4,229 (26%)	5,234 (28%)	3,219 (24%)	4,163 (26%)	5,147 (27%)
Metro Only	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
PT	1,860 (14%)	2,356 (15%)	2,914 (15%)	1,937 (15%)	2,507 (16%)	3,084 (16%)
Road	7,675 (58%)	8,858 (55%)	9,859 (52%)	7,641 (57%)	8,723 (54%)	9,757 (52%)
Total	**13,307**	**16,145**	**18,903**	**13,301**	**16,056**	**18,830**

Diagram 9.21 presents the percentage mode share in the AZ3 Dardistown to Northwood Section in the Do Minimum scenario across all years, in both scenarios. Road holds the highest percentage mode share in all years and in both scenarios, ranging from 58% in 2035 in Scenario A, to 52% in 2065 in both Scenario A and Scenario B. Walking holds the second highest mode share, increasing from approximately 24% in 2035 in both scenarios, to 28% in 2065 in Scenario A and to 27% in Scenario B.

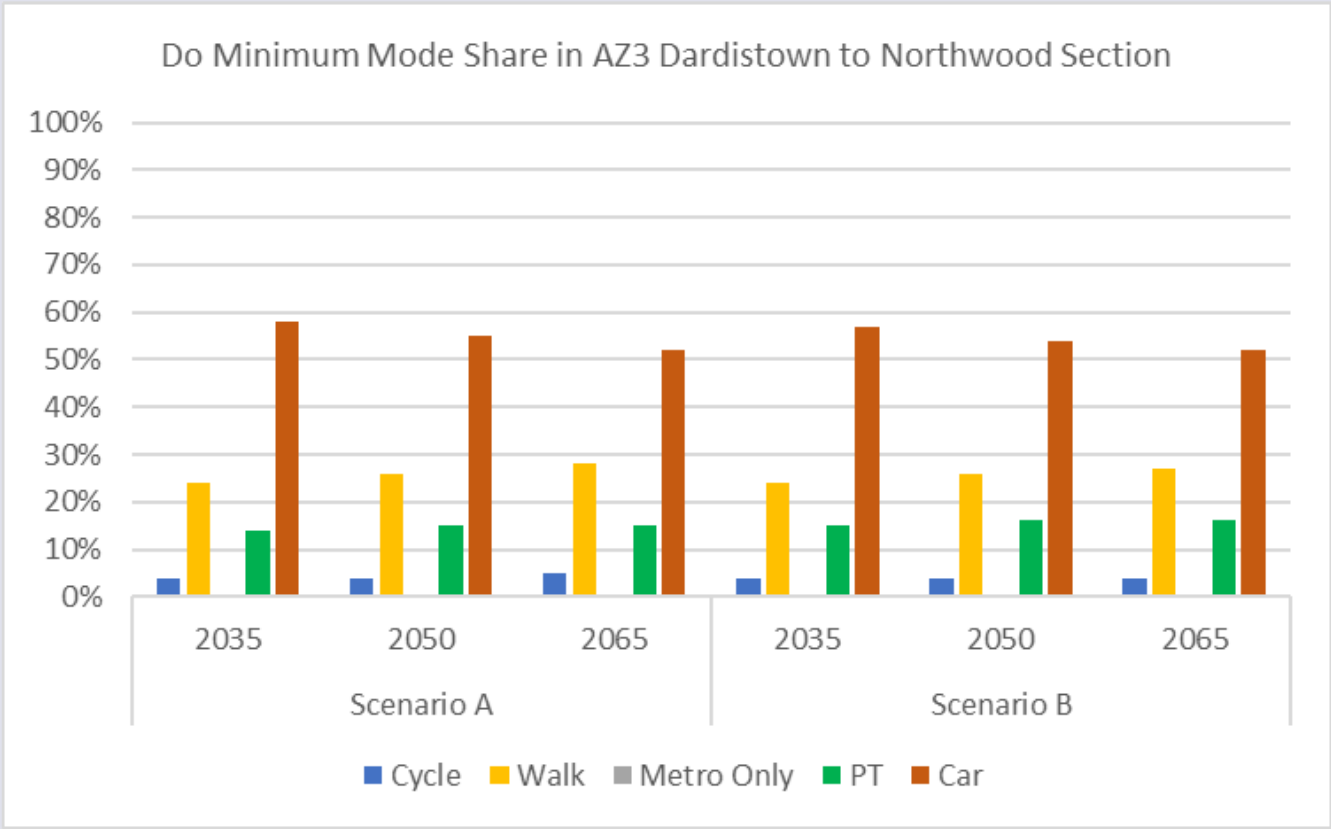

Diagram 9.20: Do Minimum Mode Share in AZ3 Dardistown to Northwood Section

9.5.2.3.1 Existing Public Transport Network

This area is currently served by a bus every 10 to 15 minutes on the R108 Ballymun Road to the west of the proposed Dardistown Station. To the north of the proposed station on Old Airport Road, the 27b service runs every 20-25 minutes. At M50 Motorway Junction 4, Dublin Bus service 42d operates once daily at 7.30am on weekdays only. Within a 600m buffer from the station there are approximately 10 bus stops, most of them located along the Ballymun Road.

Figure 9.5 illustrates all public transport facilities within 600m of the Northwood Station. The proposed station is located along the R108 Ballymun Road, which is the main access road for buses coming from and going to Harristown Bus Depot.

The public transport services in this section vary in significance (from Medium to Very High) and sensitivity (from Low to High).

9.5.2.3.1.1 Future Receiving Environment – Public Transport

As part of the Bus Network Redesign proposals, the N8 Orbital route from Clongriffin Station to Blanchardstown Centre will serve the Old Airport Road to the north of the proposed station. Other City Bound Routes 19 (Dublin Airport to Parnell Square) and 24 (Dublin Airport) will also serve the Old Airport Road and R108 Ballymun Road. Northwood station will be served by E Spine routes to Dublin City Centre.

Table 9.51 presents a summary of the existing public transport network, and the future receiving environment of AZ3 Dardistown to Northwood. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.51: Summary of Public Transport Provisions in AZ3 Dardistown to Northwood

Link	Status	Significance	Sensitivity	Comment
Route 4 and 13	Existing Network	High	Medium	Service every 10-15mins
Route 27b	Existing Network	Medium	Low	Service every 20-25mins
Route 42d	Existing Network	Low	Low	Service once daily
Bus Network Redesign E Spine	Future Receiving Environment	Very High	High	High Frequency
Bus Network Redesign Orbital Route N8	Future Receiving Environment	Very High	High	High Frequency
Bus Network Redesign Other City Bound Routes 19 and 24	Future receiving environment	High	Medium	Other City Bound Route

In the Do Minimum Scenario A 2035 AM Peak hour, public transport journeys from Finglas to Dublin City Centre locations such as O'Connell Street, St Stephen's Green and Trinity College Dublin take between 48 minutes and 58 minutes, whereas in Scenario B 2035 AM peak hour, these same journeys are approximately 1-2minutes longer.

9.5.2.3.2 Existing Road Network

The AZ3 Dardistown to Northwood Section is bound by the N2 to the west, the M1 to the east, the R108 Ballymun Road to the north, and Santry Avenue to the south. The M50 Motorway traverses through the middle of the section from east to west and vice versa.

Figure 9.6 illustrates the road network surrounding Northwood Station. The road network in the vicinity of the Northwood Station comprises the R108 Ballymun Road, the M50 Motorway in the north, St Margaret's Road in the west, Old Ballymun Road and Northwood Avenue in the east and the R104 and Santry Road in the south. The R108 Ballymun Road is a two-way dual carriageway and is part of the regional road network and provides links from the M50 Motorway in the north to Glasnevin in the south. As such, the R108 Ballymun Road is considered to be of Medium sensitivity.

9.5.2.3.2.2 Future Receiving Environment

The BusConnects Core Bus Corridor proposals commence on the R108 Ballymun Road at its junction with St Margaret's Road, south of the M50 Motorway Junction 4. Between St Margaret's Road and Shangan Road, a bus lane, two general traffic lanes and a segregated cycle track will be provided in each direction.

Table 9.52 presents a summary of the existing road network in AZ3 Dardistown to Northwood, as well as presenting the future receiving environment. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.52: Summary of Road Provisions in AZ3 Dardistown to Northwood.

Link	Status	Significance	Sensitivity	Comment
M1	Existing Network	Very High	Low	Strategic road network but limited sensitive receptors nearby
M50 Motorway	Existing Network	Very High	Low	Strategic road network but limited sensitive receptors nearby
N2	Existing Network	High	Low	National Road
R108 Ballymun Road	Existing Network	Medium	Medium	Regional Road
St Margaret's Road	Existing Network	Medium	High	Regional road however school is sensitive receptor
Old Ballymun Road	Existing Network	Low	High	Local Road
Northwood Avenue	Existing Network	Low	High	Proximity to Gulliver's Retail Park
R104 Balbutcher Lane	Existing Network	Medium	Medium	Regional Road
R104 Santry Avenue	Existing Network	Medium	High	Proximity to retail park and Northwood Business Campus
R108 Ballymun Road	Future Receiving Environment	Medium	Medium	Reconfiguration of lanes, however, remains a regional road

9.5.2.3.3 Existing Pedestrian Network

There are limited pedestrian facilities in the Dardistown area, north of the M50 Motorway. Pedestrian access is limited along the R108 Ballymun Road between the M50 Motorway and the proposed Northwood Station, as existing paths are only available on the western side of the carriageway. There is a pedestrian crossing at the St Margaret's Road/R108 junction, which is provided with dropped kerbs, tactile paving and fencing to allow for safety crossing. The pedestrian network around Northwood Station is considered to be an area of Medium to High sensitivity for pedestrians.

A pedestrian comfort assessment has been undertaken on the baseline volumes of pedestrians on the network surrounding Northwood Station.

In the immediate surrounding to the proposed station the assessment shows that during AM peak, all footway provisions currently comply with the DCC guidance as is demonstrated in Figure 9.8.

9.5.2.3.3.1 Future Receiving Environment – Pedestrian Network

As part of the BusConnects Core Bus Corridor proposals, the existing pedestrian footways and crossings at the St Margaret's Road/R108 Junction will be maintained. Additional pedestrian and cycle crossings will be provided at the R108/Northwood Avenue Junction as part of the proposals.

Table 9.53 presents a summary of the existing pedestrian network and future receiving environment within AZ3 Dardistown to Northwood. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.53: Summary of Pedestrian Provisions in AZ3 Dardistown to Northwood

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Existing Network	Medium	Medium	Suburban area
St Margaret's Road	Existing Network	Medium	Medium	Limited pedestrian attractions in area
Northwood Avenue	Existing Network	High	High	Proximity to Gulliver's Retail Park
BusConnects R108	Future Receiving Environment	High	Medium	Additional pedestrian crossings provided

9.5.2.3.4 Existing Cycle Network

There are limited cycle facilities north of the M50 Motorway at Dardistown. Figure 9.7 illustrates Dardistown Depot and Northwood Station within the GDA Cycle Network (2013). The R108 Ballymun Road from the Old Airport Road junction to the M50 Motorway, and between the M50 Motorway and Santry Avenue is a Secondary route within the GDA Cycle Network, with St Margaret's Road and Northwood Avenue contributing to the Feeder network. The R108 Ballymun Road south of Santry Avenue is part of the Primary network. Santry Greenway is also present to the north of the proposed station.

The existing cycle network in the vicinity of Northwood Station is considered to be of High sensitivity for cyclists with Level B Quality of Service.

9.5.2.3.4.1 Future Receiving Environment- Cycle Network

The BusConnects Core Bus Corridor proposals commence on the Ballymun Road at its junction with St Margaret's Road, south of the M50 Motorway Junction 4. Between St Margaret's Road and Shangan Road, a bus lane, two general traffic lanes and a segregated cycle track will be provided in each direction. Designated cycle lanes and crossings will also be provided at the R108/Northwood Avenue junction.

As part of the Draft GDA Cycle Network Plan (2021), the R108 in the vicinity of Dardistown Depot and Northwood is categorised as a Secondary Route. Santry Avenue and Balbutcher Lane remain as Secondary routes also. Northwood Avenue is categorised as a Greenway-Utility under the Draft plan.

Table 9.54 presents a summary of the existing cycle network and future receiving environment of AZ3 Dardistown to Northwood. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.54: Summary of Cycle Provisions within AZ3 Dardistown to Northwood

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Existing and Future Receiving Network	High	High	Secondary Route
St Margaret's Road	Existing Network	Medium	High	Feeder Route
Northwood Avenue	Existing Network	Medium	High	Feeder Route
Northwood Avenue	Future Receiving Environment	Medium	High	Greenway-Utility Route
Santry Avenue	Future Receiving Environment	High	High	Secondary Route
BusConnects- R108	Future Receiving Environment	High	Medium	Additional cycling facilities provided

9.5.2.3.5 Existing Parking and Loading Network

There are limited parking facilities north of the M50 Motorway in the Dardistown area. The Gulliver's Retail Park car park is in close proximity to the proposed Northwood Station and has a capacity for 800 cars.

9.5.2.3.5.1 Future Receiving Environment- Parking and Loading

The future receiving environment will remain unchanged.

Table 9.55 presents a summary of the existing parking provisions in the AZ3 Dardistown to Northwood section. The future receiving environment is not presented as this will remain unchanged. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.55: Summary of Parking Provisions in AZ3 Dardistown to Northwood

Link	Status	Significance	Sensitivity	Comment
Gulliver's Retail Park	Existing Network	High	Medium	Peripheral Retail Park

9.5.2.4 AZ4 Northwood to Charlemont

This section of the chapter presents a description of the baseline conditions (and future receiving environment) of the AZ4 Northwood to Charlemont. The stations within this section include:

- Ballymun;
- Collins Avenue (including Albert College Park Intervention Shaft);
- Griffith Park;
- Glasnevin;
- Mater;
- O'Connell Street;
- Tara Station;
- St Stephen's Green; and,
- Charlemont (including city tunnel and intervention shaft).

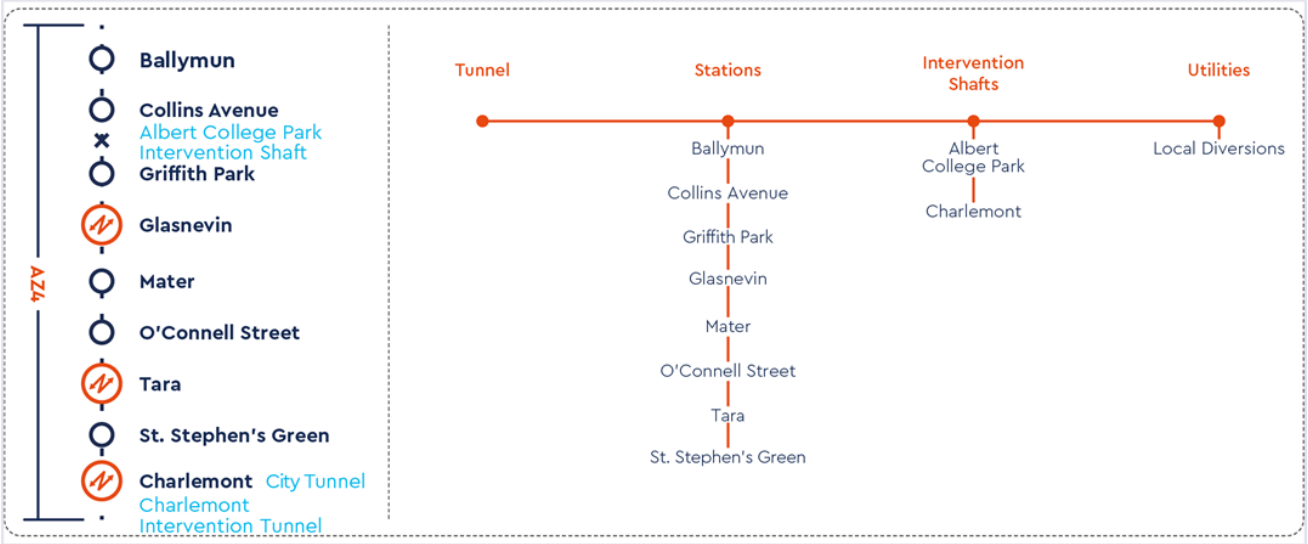

Diagram 9.21: AZ4 Location and Features

Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

2016 CSO data on 'Population aged 5 years and over by means of travel to work' indicates that in AZ4 Northwood to Charlemont Section, Road and PT hold equal mode share, at 24% respectively. Walking has the highest mode share, at 40%, with Cycling representing approximately 12%. Diagram 9.23 illustrates the modal split in the AZ3 Dardistown Depot to Northwood Section in 2016.

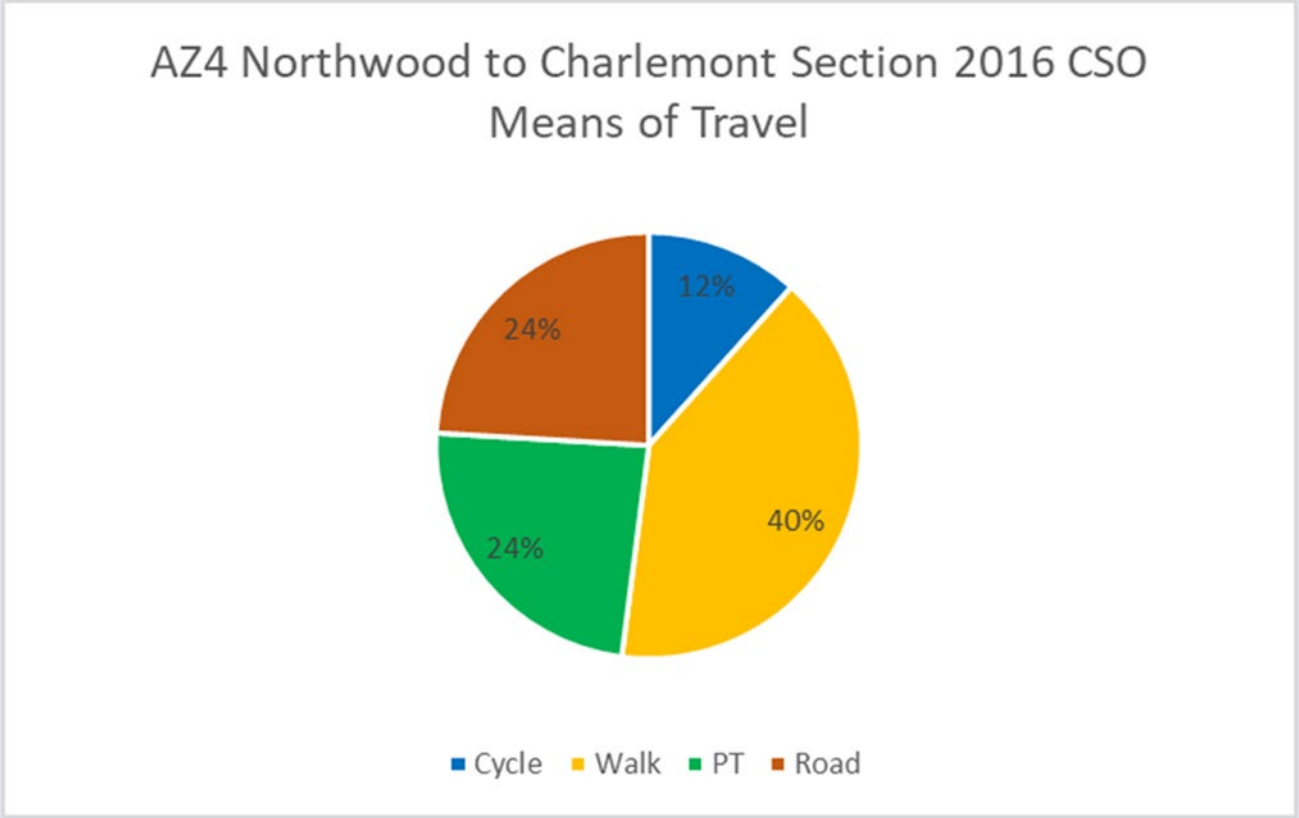

Diagram 9.22: AZ4 Northwood to Charlemont Section CSO 2016 Means of Travel

Table 9.56 presents the travel patterns in AZ4 Northwood to Charlemont Section in the future Do Minimum scenarios in 2035, 2050 and 2065. The data has been extracted from model runs undertaken using the ERM and represents a 2km catchment from the alignment. The change in travel patterns in the study area during the Operational Phase is presented in Section 9.6.2.2 Local Level Impacts.

Table 9.56: Travel Characteristics in AZ4 Northwood to Charlemont Section

AZ4	Scenario A Do Min			Scenario B Do Min		
	2035	2050	2065	2035	2050	2065
Cycle	28,393 (5%)	34,309 (6%)	40,941 (6%)	27,611 (5%)	31,152 (5%)	36,549 (5%)
Walk	179,023 (33%)	205,592 (33%)	233,459 (34%)	175,623 (32%)	196,324 (32%)	222,952 (32%)
Metro Only	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
PT	194,947 (36%)	223,508 (36%)	254,141 (37%)	204,896 (37%)	243,461 (39%)	278,135 (40%)
Road	146,096 (27%)	154,821 (25%)	162,888 (24%)	143,113 (26%)	150,868 (24%)	158,256 (23%)
Total	**548,460**	**618,230**	**691,429**	**551,243**	**621,805**	**695,892**

Diagram 9.24 presents the percentage mode share in AZ4 Northwood to Charlemont Section in the Do Minimum scenario across all years, in both Scenario A and Scenario B. Unlike the other three geographical sections, Public Transport holds the highest percentage mode share in all years, in both scenarios, ranging from 36% in 2035 to 37% in 2065 in Scenario A, up to 40% in Scenario B 2065. This is followed by Walking, which reaches 34% mode share in 2065 in Scenario A and, 32% in Scenario B 2065. Car mode share decreases in both scenarios, from 7% in Scenario 2035 to 24% in 2065, and from 26% in Scenario B 2035 to 23% in 2065.

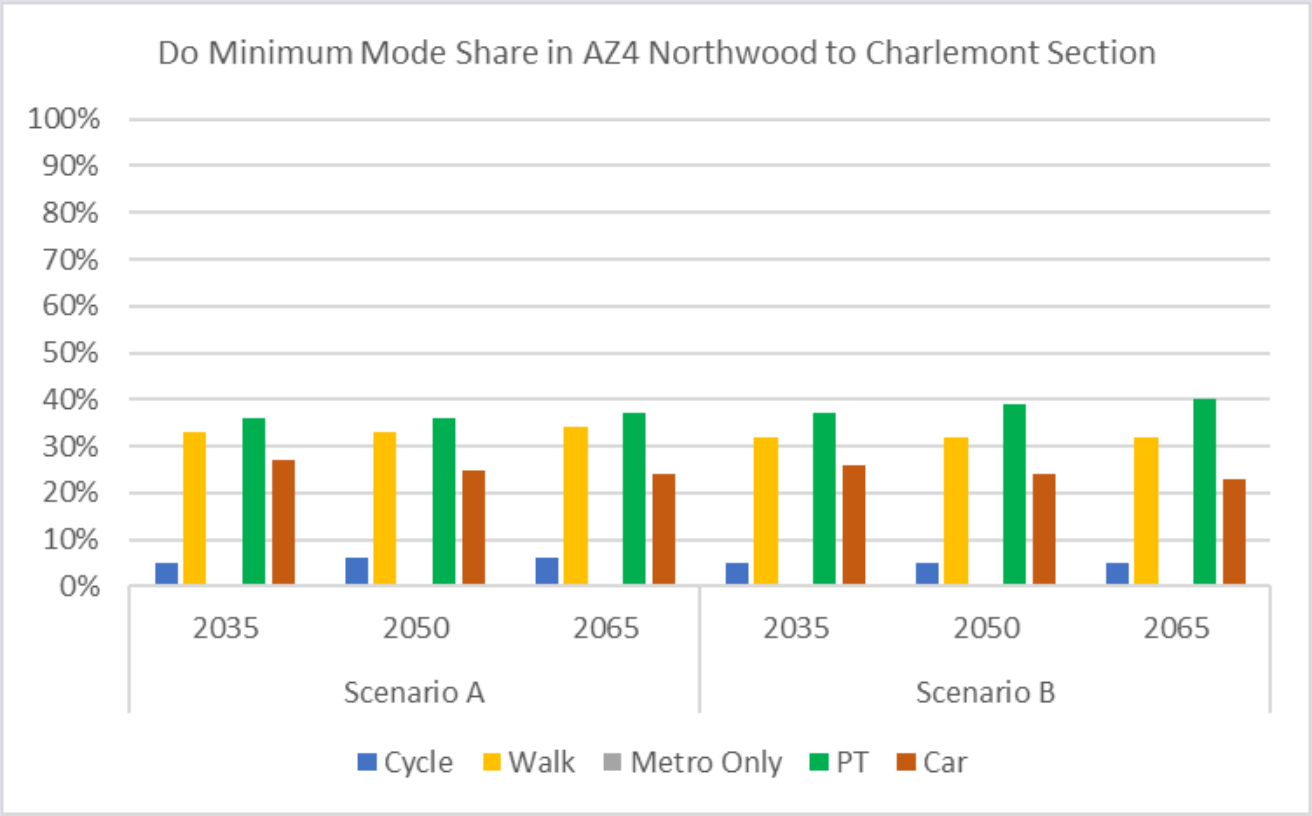

Diagram 9.23: Do Minimum Mode Share in AZ4 Northwood to Charlemont Section

9.5.2.4.1 Existing Public Transport Network

Figure 9.5 shows the existing public transport provisions around each station in this section. This section of the alignment is well-served by the existing public transport network, as the DART heavy rail network runs through this section, which is both Very High in significance and sensitivity. The Luas light rail system is also present, with the Red Line serving east to west and vice versa, with stops in close proximity to the alignment on Abbey Street. The Luas Green Line serves areas from north to south and vice versa, with stops in close proximity to the alignment at Charlemont, as well as O'Connell Street, and St Stephen's Green. The Luas is considered to have very High Significance, and High sensitivity as it

offers a high frequency and high capacity. The area is served by the existing bus network, with multiple services with frequencies of less than 15 minutes, which are highly significant services, and of High sensitivity.

9.5.2.4.1.2 Future Receiving Environment – Public Transport

As part of the BusConnects Bus Network Redesign Proposals, AZ4 will be served by a number of Spine Routes (A, E and F Spine), offering high frequency services to and from Dublin City Centre. A number of Orbital Routes (such as the N8 Finglas to Donaghmede and N4 Blanchardstown to Killester), Other City Bound Routes, and Local Routes will also serve the area. As such, the bus-based public transport services in this section vary in significance and sensitivity, from Low to Very High.

Table 9.57 presents a summary of the public transport provisions and future receiving environment in AZ4 Northwood to Charlemont. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.57: Summary of Public Transport Provisions in AZ4 Northwood to Charlemont

Link	Status	Significance	Sensitivity	Comment
Bus Services within 600m buffer of stations	Existing Network	High	High	Frequency of less than 15mins
Luas Green Line	Existing Network	Very High	High	High frequency/ high-capacity service
Luas Red Line	Existing Network	Very High	High	High frequency/ high-capacity service
DART (Tara Street)	Existing Network	Very High	Very High	Interchange with heavy rail network
DART (Glasnevin)	Future Receiving Environment	Very High	Very High	Interchange with heavy rail network
Bus Network Redesign A, E and F Spine	Future Receiving Environment	Very High	High	High Frequency
Bus Network Redesign Orbital Route N8	Future Receiving Environment	High	Medium	High Frequency
Bus Network Redesign Orbital Route N4	Future receiving environment	Very High	High	High Frequency
Bus Network Redesign Other City Bound Routes 19, 22, 23, 24, 48, and 85	Future Receiving Environment	High	Medium	High Frequency
Bus Network Redesign Local Route L80	Future receiving environment	Medium	Low	Local Route
Bus Network Redesign Multiple Routes of Multiple Frequencies in Dublin City Centre	Future Receiving Environment	Very High	High	High Frequency
DART+ West and South-West	Future Receiving Environment	Very High	Very High	Interchange with heavy rail network

In the Do Minimum Scenario A 2035 AM peak hour, public transport journeys from Sandyford to Ballymun take approximately 1 hour 10 minutes through a combination of the Luas Green Line and the bus network. From Glasnevin to Dublin City Centre locations such as O'Connell Street and St Stephen's Green take between 23 and 35 minutes. In Scenario B, these same journeys take approximately 20 to 31 minutes.

9.5.2.4.2 Existing Road Network

The AZ4 Northwood to Charlemont Section is bound by the M50 Port Tunnel to the east, the M50 Motorway to the north, west and south. The area is well-served by the regional road network, such as the R108 Ballymun Road, R135 Finglas Road, R138 Leeson Street and R118 Pearse Street among others. A number of local roads are also present in close proximity to the proposed stations, such as Home Farm Road, Lindsay Road, Eccles Street, Townsend Street, Hume Street and Dartmouth Road. As such, the road network in this section ranges in significance (from Low to Very High) and sensitivity (from Low to High).

9.5.2.4.2.1 Future Receiving Environment- Road Network

As part of the BusConnects Core Bus Corridor proposals, there will a reconfiguration of lanes on the R108 Ballymun Road and Leeson Street Lower/St Stephen's Green to accommodate additional bus lanes.

Table 9.58 presents a summary of the existing road network and the future receiving environment in the AZ4 Northwood to Charlemont section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.58: Summary of Road Provisions in AZ4 Northwood to Charlemont

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Existing Network	Medium	Medium	Regional Road
M50 Motorway	Existing Network	Very High	Low	Strategic road network however limited sensitive receptors nearby
St Margaret's Road	Existing Network	Medium	High	Regional road however school is sensitive receptor
Old Ballymun Road	Existing Network	Low	High	Local Road
Northwood Avenue	Existing Network	Low	High	Proximity to Gulliver's Retail Park
R104 Balbutcher Lane	Existing Network	Medium	Medium	Regional Road
R104 Santry Avenue	Existing Network	Medium	High	Proximity to retail park and Northwood Business Campus
Sillogue Road	Existing Network	Low	High	Local Road
Shangan Road	Existing Network	Low	High	Local Road
R103 Collins Avenue/Glasnevin Avenue	Existing Network	Medium	High	Regional road but DCU and schools as key attractors
R102 Griffith Avenue	Existing Network	Medium	Medium	Regional Road
R108 St Mobhi Drive	Existing Network	Medium	High	Regional Road
Home Farm Road	Existing Network	Low	High	Local Road
R108 Prospect Road	Existing Network	Medium	High	Regional Road but in large residential area
R135 Finglas Road	Existing Network	Medium	High	Regional Road but in large residential area
N1/R132 Drumcondra Road Lower	Existing Network	High	High	Arterial link (National Road)
Whitworth Road	Existing Network	Low	High	Local Road
Lindsay Road	Existing Network	Low	High	Local Road

Link	Status	Significance	Sensitivity	Comment
Iona Road	Existing Network	Low	High	Local Road
Eccles Street	Existing Network	Low	High	Local road, with Mater Hospital
Berkeley Road	Existing Network	Low	High	Local road, near Mater Hospital
R101 North Circular Road	Existing Network	Medium	Medium	Regional Road
N1 Dorset Street Lower	Existing Network	High	Low	Arterial (National Road)
R803 Parnell Street	Existing Network	Medium	Medium	Regional Road
R135 Parnell Square West	Existing Network	Medium	Medium	Regional Road
O'Connell Street	Existing Network	High	High	Dublin City Centre location
Abbey Street	Existing Network	Low	High	Dublin City Centre location
R802 Tara Street	Existing Network	Medium	High	Regional Road in Dublin City Centre
R118 Pearse Street	Existing Network	Medium	High	Regional Road in Dublin City Centre
R105 Burgh Quay	Existing Network	Medium	High	Regional Road in Dublin City Centre
Townsend Street	Existing Network	Low	High	Local Road in Dublin City Centre
Poolbeg Street	Existing Network	Low	High	Local Road in Dublin City Centre
R110 St Stephen's Green	Existing Network	Medium	High	Regional Road in Dublin City Centre
R811 Hatch Street Upper	Existing Network	Medium	High	Regional Road in Dublin City Centre
R816 Baggot Street	Existing Network	Medium	High	Regional Road in Dublin City Centre
R114 Camden Street	Existing Network	Medium	High	Regional Road in Dublin City Centre
R138 St Stephen's Green	Existing Network	Medium	High	Regional Road in Dublin City Centre
Hume Street	Existing Network	Low	High	Local road in Dublin City Centre
Merrion Street Upper	Existing Network	Low	High	Local road in Dublin City Centre
R111 Grand Parade	Existing Network	Medium	Medium	Regional Road
R117 Ranelagh Road	Existing Network	Medium	Medium	Regional Road
R138 Leeson Street Upper	Existing Network	Medium	Medium	Regional Road

Link	Status	Significance	Sensitivity	Comment
Dartmouth Road	Existing Network	Low	High	Local Road
R108 Ballymun Road	Future Receiving Environment	Medium	High	Reconfiguration of lanes on a regional road
Leeson Street Lower/St Stephen's Green	Future Receiving Environment	Medium	High	Reconfiguration of lanes in Dublin City Centre Location
R108 Prospect Road	Future Receiving Environment	Medium	High	Reconfiguration of lanes on regional road

9.5.2.4.3 Existing Pedestrian Network

The AZ4 Northwood to Charlemont section is well served by pedestrian facilities. As much of the section falls within DCC, the DCC Pedestrian Street Hierarchy is used to delineate the pedestrian network into Civic Spine and Liffey Corridor (O'Connell Street, George's Quay) Primary Routes (Grafton Street, Henry Street), Secondary Routes (St Stephen's Green, Parnell Street), Historic Approaches (Leeson Street, R108 Ballymun Road) and Linking Routes (Tara Street, Merrion Street Upper). As the AZ4 Northwood to Charlemont includes residential and suburban areas, as well as much of Dublin City Centre, the pedestrian network ranges in significance and sensitivity from Low to Very High.

A baseline pedestrian comfort assessment has been undertaken at each station, utilising the baseline pedestrian volumes on each link. Many of the streets meet with DCC's pedestrian comfort guidance as identified in the Dublin City Development Plan, however 14 links fall below the DCC comfort guidance, with 2 of these being identified as 'Unacceptable' (Glasnevin Avenue, Hume Street) against TfL's Pedestrian Comfort Level Calculator as a result of the existing configuration of street furniture on these links. Figure 9.8 presents the results of the pedestrian comfort assessment in the baseline scenario.

9.5.2.4.3.1 Future Receiving Environment- Pedestrians

The future receiving environment of the pedestrian network will be altered as part of the BusConnects Core Bus Corridor proposals, with improvements made to pedestrian footways along a number of key routes such as along the R108 Ballymun Road, which also includes the provision of new pedestrian crossings at locations such as Ballymun and Glasnevin.

Table 9.59 presents a summary of the existing pedestrian network and future receiving environment within the AZ4 Northwood to Charlemont section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.59: Summary of Pedestrian Provisions within AZ4 Northwood to Charlemont

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Existing Network	Medium	Medium	Suburban area
St Margaret's Road	Existing Network	Medium	Medium	Limited pedestrian attractions in area
Northwood Avenue	Existing Network	High	High	Proximity to Gulliver's Retail Park
Sillogue Road	Existing Network	Medium	High	Suburban with nearby trip attractors
Shangan Road	Existing Network	Medium	High	Employment centres

Link	Status	Significance	Sensitivity	Comment
R108 St Mobhi Road	Existing Network	Medium	High	Suburban area but Whitehall College of Further Education as key attractor
Home Farm Road	Existing Network	Medium	Medium	Suburban area
R108 Prospect Road	Existing Network	High	High	Proximity to Phibsborough neighbourhood
R135 Finglas Road	Existing Network	High	High	Proximity to St Vincent's Secondary School
Whitworth Road	Existing Network	High	High	Proximity to Phibsborough neighbourhood
Berkeley Road	Existing Network	Medium	High	Suburban area but proximity to Mater Hospital and Phibsborough
Eccles Street	Existing Network	Medium	High	Suburban area but proximity to Mater Hospital and Phibsborough
Goldsmith Street	Existing Network	Medium	High	Suburban area but proximity to Mater Hospital and Phibsborough
Sarsfield Street	Existing Network	Medium	High	Suburban area but proximity to Mater Hospital and Phibsborough
O'Connell Avenue	Existing Network	Medium	High	Suburban area but proximity to Mater Hospital and Phibsborough
N1 Dorset Street Lower	Existing Network	Low	Low	DCC Historic Approach
O'Connell Street	Existing Network	Very High	Very High	DCC Civic Spine and Liffey Corridor
R803 Parnell Street	Existing Network	Very High	High	DCC Secondary Route
Frederick Street North	Existing Network	Very High	High	DCC Secondary Route
Henry Street	Existing Network	Very High	High	DCC Primary Route
R105 George's Quay	Existing Network	Very High	High	DCC Civic Spine and Liffey Corridor
R802 Tara Street	Existing Network	High	Medium	Linking Route
St Stephen's Green	Existing Network	Very High	High	DCC Secondary Route
R138 Merrion Row	Existing Network	Very High	High	DCC Secondary Route
Merrion Street Upper	Existing Network	High	Medium	DCC Linking Route
Earlsfort Terrace	Existing Network	Low	Low	DCC Historic Approach
Grafton Street	Existing Network	Very High	Very High	DCC Primary Route
R111 Grand Parade	Existing Network	High	High	Proximity to Dublin City Centre
Dartmouth Road	Existing Network	Medium	High	Suburban area but proximity to Dublin City Centre
R117 Ranelagh Road	Existing Network	High	High	Proximity to Dublin City Centre

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Future Receiving Environment	High	Medium	Suburban area, but with improved crossing facilities
R108 St Mobhi Road	Future Receiving Environment	Medium	High	Narrowing of footways in this area
R108 Phibsborough Road	Future Receiving Environment	High	High	Widening of footpath near Phibsborough Neighbourhood
Royal Canal Bank	Future Receiving Environment	Very High	High	Provision of new footbridge over Royal Canal
O'Connell Street/Moore Street	Future Receiving Environment	Very High	Very High	New linkage in Dublin City Centre

9.5.2.4.4 Existing Cycle Network

Figure 9.7 illustrates each of the stations in AZ4 Northwood to Charlemont within the GDA Cycle Network. The network in this section is made up of Primary Routes, Secondary Routes, and the Feeder Network, as well as the Santry Greenway and Grand Canal Greenway. Cycle facilities in the section include a mix of mandatory cycle lanes, advisory cycle lanes, shared bus and cycle lanes. Dublin Bikes Hubs are also present within Dublin City Centre. The cycle network ranges in both significance and sensitivity in this section, offering between a Level B and C Quality of Service across the section.

9.5.2.4.4.1 Future Receiving Environment- Cycle Network

As part of the BusConnects Core Bus Corridor proposals, improvements will be made to links such as the R108 Ballymun Road/St Mobhi Road to accommodate the provision of designated cycle lanes and crossing facilities. A new cycle bridge will also be provided over Royal Canal as part of the proposals.

As part of the Draft GDA Cycle Network Plan (2021), the R108 Ballymun Road is categorised as a Primary Radial route. The R103 Glasnevin Avenue/Collins Avenue Extension is categorised as a Primary Orbital route under the Draft plan, as well as the eastern section of Whitworth Road at Glasnevin Station, O'Connell Street, Pearse Street at Tara Station, and St Stephen's Green North/Merrion Row.

Table 9.60 presents a summary of the existing cycle network and future receiving environment within AZ4 Northwood to Charlemont section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.60: Summary of Cycle Provisions within AZ4 Northwood to Charlemont

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Existing Network	High	High	Secondary Route
St Margaret's Road	Existing Network	Medium	High	Feeder Route
Northwood Avenue	Existing Network	Medium	High	Feeder Route
Shangan Road	Existing Network	Medium	Medium	Feeder Route
St Canices Road	Existing Network	Medium	High	Feeder Route
Albert College Park	Existing Network	Medium	High	Minor Greenway
R108 St Mobhi Road	Existing Network	High	High	Primary Network
Dublin Industrial Estate	Existing Network	Low	Low	Industrial estate
Glasnevin Hill Road	Existing Network	Medium	Medium	Suburban
R108 Prospect Road	Existing Network	High	High	Primary Route
Whitworth Road	Existing Network	High	Medium	Primary Route

Link	Status	Significance	Sensitivity	Comment
Iona Road	Existing Network	Medium	Medium	Feeder Route
R108 Phibsborough Road	Existing Network	High	High	Primary Route
Eccles Street	Existing Network	Medium	Medium	Cycle facilities present but not part of GDA Network
Berkeley Road	Existing Network	Medium	Medium	Cycle facilities present but not part of GDA Network
N1 Dorset Street Lower	Existing Network	Medium	High	Primary Route
O'Connell Street	Existing Network	Very High	Very High	Primary Route in Dublin City Centre
Cathal Bruga Street	Existing Network	High	Very High	Secondary Route in Dublin City Centre
R802 Gardiner Street Upper and Lower	Existing Network	High	Very High	Dublin City Centre
Talbot Memorial Bridge	Existing Network	Very High	Very High	Primary Route in Dublin City Centre
R813 City Quay	Existing Network	Very High	Very High	Primary Route in Dublin City Centre
R118 Pearse Street	Existing Network	High	High	Secondary Route in Dublin City Centre
R138 D'Olier Street	Existing Network	High	High	Secondary Route in Dublin City Centre
Trinity College Dublin	Existing Network	Medium	High	Feeder Route in Dublin City Centre
St Stephen's Green	Existing Network	Very High	Very High	Primary route in Dublin City Centre
Hume Street	Existing Network	Very High	Very High	Primary route in Dublin City Centre
R138 Leeson Street	Existing Network	Very High	Very High	Primary route in Dublin City Centre
Earlsfort Terrace	Existing Network	High	Very High	Secondary route in Dublin City Centre
Dawson Street	Existing Network	Medium	Very High	Feeder route in Dublin City Centre
St Stephen's Green North	Existing Network	Medium	Very High	Feeder route in Dublin City Centre
Charlemont Street/ R117 Ranelagh Road	Existing Network	High	High	Primary Route
R111 Grand Parade	Existing Network	High	High	Primary Route, Secondary route and Feeder route
R108/Northwood Avenue	Future Receiving Environment	High	High	Improved facilities on these routes
R108 Ballymun Road	Future Receiving Environment	High	Very High	Primary Route with improved facilities
R108 St Mobhi Road	Future Receiving Environment	High	High	Primary Network with improvements to facilities
R103 Glasnevin Avenue/Collins Avenue Extension	Future Receiving Environment	High	High	Primary Orbital Route

Link	Status	Significance	Sensitivity	Comment
Whitworth Road	Future Receiving Environment	High	High	Primary Orbital Route
O'Connell Street	Future Receiving Environment	High	High	Primary Orbital Route
Pearse Street	Future Receiving Environment	High	High	Primary Orbital Route
St Stephen's Green North/Merrion Row	Future Receiving Environment	High	High	Primary Orbital Route
Royal Canal Bank	Future Receiving Environment	Very High	High	Provision of new bridge over Royal Canal

9.5.2.4.5 Existing Parking and Loading Network

In AZ4 within the vicinity of the stations, there is a mix of local residential parking and informal street parking in the outer-city region, and designated Dublin City Centre parking facilities. Loading bays are present along Berkeley Road, at the LIDL store located on the west side of Moore Lane at O'Connell Street station, on Tara Street immediately opposite the south-west boundary of the site, and on Townsend Street on the southern side of the road close to the railway overbridge. A taxi rank is also present on Eccles Street, near Mater Station.

9.5.2.4.5.1 Future Receiving Environment- Parking and Loading

As part of the BusConnects Core Bus Corridor proposals, lane reconfiguration on the R108 Ballymun Road will restrict informal parking. In Dublin City Centre locations, there will be no change to current parking facilities. On-street parking in Dublin City Centre limited in line with the provisions of the Dublin City Development Plan.

Table 9.61 presents a summary of the existing parking network and future receiving environment in the AZ4 Northwood to Charlemont section. Further details on the baseline conditions can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Table 9.61: Summary of the Parking Provisions in AZ4 Northwood to Charlemont

Link	Status	Significance	Sensitivity	Comment
R108 Ballymun Road	Existing Network	High	High	Informal on street parking for school
Albert College Court	Existing Network	Medium	Medium	Paid parking
R108 Ballymun Road	Future receiving Environment	High	High	Lane reconfiguration will restrict informal parking
St Mobhi Drive	Existing Network	Low	High	Informal on-street parking
Lindsay Road	Existing Network	Low	High	Local residential parking
Eccles Street- Parking and Taxi Rank	Existing Network	High	High	Proximity to Mater Hospital
Berkeley Road -Parking Nand Commercial Loading Bays	Existing Network	High	High	Proximity to Mater Hospital and Commercial Units
Nelson Street	Existing Network	High	High	Proximity to Mater Hospital
O'Connell Street	Existing Network	-	-	No parking
Moore Lane (O'Connell Street)	Existing Network	High	High	Dublin City Centre loading bay
Tara Street Loading Bay	Existing Network	High	High	Dublin City Centre loading bay
Townsend Street Loading Bay	Existing Network	High	High	Dublin City Centre loading bay
Local Roads	Existing Network	High	High	Dublin City Centre
City Centre Locations	Existing Network	High	High	Dublin City Centre parking
Dartmouth Road	Existing Network	Low	Low	Residential On-street parking

9.6 Predicted Impacts

The proposed Project will have an impact during both the Construction and Operational Phases, both of which will be discussed in the following sections. Due to the scale of the proposed Project, the impacts will be considered at both the strategic and the local level.

A Scheme Traffic Management Plan (STMP) has been prepared to outline the potential impacts on all road users, during the peak construction activity year, identified as 2028. Users include public transport users, cyclists and pedestrians throughout the proposed Project Construction Phase. The STMP provides a detailed assessment of TTM measures and residual impacts. The STMP can be found in Appendix A9.5.

Traffic and Transport Assessments have also been prepared for the proposed Project as a whole, and on a station-specific level. These assessments detail impacts during the Operational Phases of the proposed Project and present local modelling impacts for relevant impacted locations.

9.6.1 Predicted Construction Impact

This section outlines the likely impact of the proposed Project on the surrounding traffic and transport network during the Construction Phase. Estimates of traffic volumes associated with the proposed Project construction activities have been prepared by the Project team in the Construction Vehicles Report (Appendix A5.7). The total number of vehicle movements, the daily range of movements (the average range, not including maximum outliers), the maximum number of daily movements, and the

maximum number of weekly movements, are outlined for each station or relevant section along the alignment, over the course of the construction programme.

Chapter 5 (MetroLink Construction Phase) provides an overview of the construction activities and methods that are anticipated to be used during construction, systems testing and commissioning of the proposed Project. It provides a description of the construction areas including site offices and construction compounds. It discusses the phasing of construction activity, proposed working hours, the principal construction activities, area specific construction activities, and measures required to minimise the impact of construction activities on the receiving environment.

The STMP assesses the impact of both the Enabling Works and Main Works, the details of which are also contained within Chapter 5 (MetroLink Construction Phase).

The STMP contains the details on the Magnitude of the impact, while the sensitivity of the receptor has been identified in section 9.5 Baseline Environment. The assessment therefore presents a summary of the magnitude of the impact, the sensitivity of the receiving environment and the significance of the impact on the receiving environment as a result of a combination of the magnitude and sensitivity for the purposes of the EIAR.

The Construction Phase assessment, as presented in the STMP (Appendix A9.5) considers the impacts on the following users:

- Public Transport Users (Bus journey times and alterations to bus stops);
- General Traffic (Increase in traffic flow PCUs, increase in driver delay, increase in HGV flows);
- Vulnerable Users (Pedestrians and Cyclists – Safety, Infrastructure impact measure, and increase in journey length); and,
- Parking and Loading (Diversion for access, reduction of on street loading facilities, loss of commercial/residential parking).

9.6.1.1 Strategic Overview

The impacts resulting from the Construction Phase will occur primarily due to the traffic management arrangements associated with the construction of the proposed Project stations, and the associated movement of the construction vehicles. The construction of stations will require areas of road space to be removed for some time which will reduce the operating capacity for some road users. Each of the proposed Project's construction sites will also generate HGV movements associated with spoil removal, delivery of materials and general construction vehicles, which will impact on both the local and strategic road network.

The STMP (Appendix A9.5) presents the strategic impact assessment results on traffic flow, traffic delay and route journey times, highlighting the links which will face the most severe of the construction impacts in both the AM and PM peak hours during the assumed peak construction year 2028.

9.6.1.1.1 Construction Phasing

Diagram 9.25 details the activities to be undertaken throughout the construction phase. The activities described here should be regarded as being a conservative assessment of the construction work to be undertaken. A detailed programme and schedule of works will be developed prior to the commencement of work on-site by the appointed contractor(s) and will be dependent on the finalised detailed design in addition to the finalised works methodology to be developed by the appointed contractor(s).

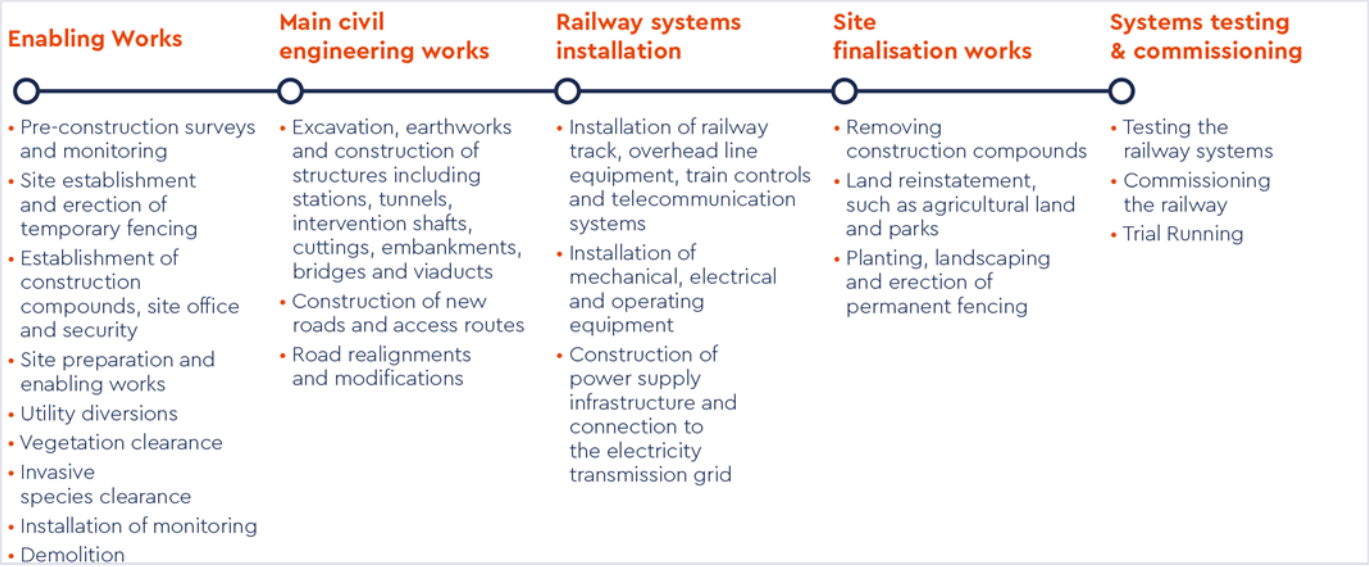

Diagram 9.24: Proposed Construction Phase Activities

There is likely to be concurrent construction phases with other planned projects, should these receive planning consent and funding within the lifetime of the proposed Project. The known major projects where a construction overlap is possible with the proposed Project alignment include the following:

- The R132 Connectivity Project;
- BusConnects;
- The Hines 'Two Grand Parade' Development at Charlemont;
- The Dart+ Programme; and
- The Hammerson 'Dublin Central' Development at O'Connell Street.

During the development of the indicative construction programme for the proposed Project, consultation has been undertaken with each project team to coordinate predicted construction phasing to minimise potential impacts associated with concurrent construction activity. Many other developments also have the potential to take place concurrently and form part of the cumulative impact assessment presented in Chapter 30 (Cumulative Impacts of Interactions Between Other Projects and MetroLink) of this EIAR.

Construction sequencing specific to the AZ1 Northern Section is presented in 9.6.1.2.1.

9.6.1.1.2 Abnormal Loads

Chapter 5 (MetroLink Construction Phase) details how abnormal loads will be dealt with throughout the Construction Phase. As outlined in S.I. No. 5/2003 – Road Traffic (Construction and Use of Vehicles) Regulations 2003 and in addition with the Road Safety Authority (RSA) Guidelines on Maximum Weights and Dimensions of Mechanically Propelled Vehicles and Trailers, including Manoeuvrability Criteria (RSA 2020), the movement of abnormal loads required during the Construction Phase of the proposed Project will require an Abnormal Load Permit to be issued by An Garda Síochána and the Local Authority. Furthermore, an Abnormal Load Route Survey Report (Appendix A5.6) was prepared that informed the designated haul routes for the delivery of abnormal loads including the identification of all pinch points on the selected routes and swept path analysis and vertical assessments. For example, at Dublin Airport North Portal, the Tunnel Boring Machine (TBM) reception site will be used to extract the TBM after completion of the Airport tunnel. The TBM will be dismantled from this portal and will be removed from the site following the designated haul routes identified in the Abnormal Load Route Survey.

9.6.1.1.3 Construction Worker Travel

A Construction Sustainable Mobility Plan will be prepared to support and promote sustainable travel for construction staff travelling to and from the proposed Project site. The mobility plan is a management tool designed to encourage construction staff to rethink their travel choices and requirements during

construction in order to minimize the adverse impacts on the environment and on the operation of the transport network within the city. It will be an active document that will require to be updated on a regular basis as construction activities take place and will present a series of measures designed to encourage travel to the constructions site(s) in a sustainable way.

9.6.1.1.4 Modelled Closures

To assess the impact of the construction of the Project a fixed demand SATURN model was used, based on the NTA's 2016 Eastern Regional Model.

The purpose of this test was to assess the impact on the strategic road network of both

- The construction vehicle traffic, and
- The construction road closures.

Two scenarios were identified for the strategic modelling, one representing the busiest period for the construction sites north of the M50 Motorway, the Northern Peak and one that represents the busiest period for the construction sites south of the M50 Motorway, the Southern Peak.

To assess the impact of both the Enabling Works and Main Works, construction closure scenarios were modelled. A series of necessary road/lane closures within the M50 Motorway which are planned as part of the construction of the proposed Project were applied to the same model (even though they will not occur simultaneously during the construction phase), along with the Southern Peak construction vehicle demands, to serve as a sort of "worst case" scenario.

The Main Works closures modelled for the central and south sections are presented in Table 9.62.

Table 9.62: Main Works diversions for central and south sections applied to model

Site	Main Works Closures and Lane Reductions
Dublin Airport North Portal	No closures or lane reductions
Dublin Airport	No closures or lane reductions
Dublin Airport South Portal	No closures or lane reductions
Dardistown	No closures or lane reductions
M50 Viaduct	No closures or lane reductions
Northwood	Realignment of the R108 between Northwood Avenue and St Margaret's Road, distance increased by 80 metres to account for this.
Ballymun	A reduction of one northbound lane and one southbound lane on the R108 immediately south of Shangan Road/R108 junction.
Collins Avenue	A reduction of one northbound lane and one southbound lane on the R108 immediately south of the R103 Albert College Drive closed to traffic
Griffith Park	Removal of southbound bus lane on the R108 adjacent to the site (approx. 75 meters in length)
Glasnevin	No closures or lane reductions
Mater	Realigned to make Eccles Street priority route, realigned Berkeley Street
O'Connell Street	No closures or lane reductions
Tara Street	Luke Street and Poolbeg Street closed to through traffic in the vicinity of the station construction
St Stephen's Green	A reduction of one northbound lane on St Stephen's Green
Charlemont	Dartmouth Road closed between Dartmouth Place and Dartmouth Square West

The Swords closures were modelled in separate models using peak Swords Construction Vehicles movements which reflects the construction programme which has aimed to minimize any overlap of the TTM and presents the 'worst-case' scenario for vehicle movements. Note that for the Seatown and Estuary closure scenarios, provision is made for U-turns on the R132, northbound north of R132/R125 Estuary junction to switch to R132 southbound and southbound south of Seatown junction to switch to R132 northbound.

Table 9.63: Main Works diversions for north section applied to model

Site	Site Works Road Closures and Lane Reductions
Northern R132/R125 (Estuary Junction)	Western arm of this junction (R125) to become left-in left-out only, with provision for right turning buses from the R132 southbound. At the R125-R836 junction the right turn movement from the R125 eastbound to the R836 southbound is closed to general traffic but still open for buses
R132/ L2143 Seatown Road/ L6310 Mantua Road (Seatown Junction)	Eastern arm of this junction (Seatown Road) to become left-in left-out only
R132/ R106 Malahide/ Drynam Road (Malahide Junction)	Reduction to only two lanes on eastern approach to Malahide Roundabout
Pinnock Hill Junction	Total closure of eastern R125 arm
Airside Junction	Eastern arm of this signalised junction closed. To the south a left in only priority junction is provided for westbound traffic from Nevinstown Lane

In addition to the Main Works construction closure scenarios, scenarios were also tested for the impact of the Enabling Works. For these the construction vehicles were not assumed to be significant, only the closures were modelled. Enabling Works closures within the M50 Motorway are listed in Table 9.64.

Table 9.64: Enabling Works Closures for Central and South Sections Applied to Model

Site	Enabling Works Closures
Dublin Airport North Portal	No closures or lane reductions
Dublin Airport Station	No closures or lane reductions
Dublin Airport South Portal	No closures or lane reductions
Dardistown Depot	No closures or lane reductions
M50 Viaduct	No closures or lane reductions
Northwood Station	Between Ballymun Road/St Margaret's Road junction and Ballymun Road/Santry Avenue junction: 2 lanes in each direction.
Ballymun Station	A reduction of one northbound lane and one southbound lane on the R108 immediately south of Shangan Road/R108 junction.
Collins Avenue Station	Between Ballymun Road/School entrance junction and Ballymun Road/St Pappin Road junction: 1 lane of general traffic in each direction and 1 lane for buses in each direction.
Griffith Park Station	Between St Mobhi Road/ Home Farm Road junction and St Mobhi Road/St Mobhi Drive junction: 1 lane of traffic in each direction and removal of bus lane
Glasnevin Station	Removal of 90m of bus lane on Prospect Road northbound.
Mater Station	A signalised one-way section on Berkeley Street south of its junction with Sarsfield Road
O'Connell Street Station	No closure to model
Tara Station	Tara Street reduced capacity to three lanes between Poolbeg Street and Townsend

Site	Enabling Works Closures
	Street.
St Stephen's Green Station	Hume Street Closed and SSG east reduced to 1 lane northbound and bus lane southbound.
Charlemont Station	Dartmouth Road closed

Table 9.65 shows the closures applied to junctions as part of the Enabling Works within the Swords area.

Table 9.65: Enabling Works Diversions for North Section Applied to Model

Junction	Signalised Scenario Description (Worst Case)
Dublin Airport North Portal	No closures or lane reductions
Dublin Airport Station	No closures or lane reductions
Dublin Airport South Portal	No closures or lane reductions
Dardistown	No closures or lane reductions
Northern R132/R125 (Estuary Junction)	No change to junction, but R132 south of junction reduced to 1 lane in each direction.
R132/ L2143 Seatown Road/ L6310 Mantua Road (Seatown Junction)	No change to junction, but R132 north and south of junction reduced to 1 lane in each direction.
Seatown Road Minor left-in left-out priority junction	No closures or lane reductions
R132/ R106 Malahide/ Drynam Road (Malahide Junction)	No change to junction, but R132 north and south of junction reduced to 1 lane in each direction.
Pinnock Hill Junction	No closures (outside of main works)
R132/L2300/L2305 Junction	No change to junction, but R132 south of junction reduced to 1 lane southbound.

Table 9.66 shows the overall list of all models ran for the modelling of the traffic impact during the entire Construction Phase.

Table 9.66: Full List of Scenarios Modelled

Scenario	Time Period	Construction Vehicles	Road Closures and Lane Reduction
Do Minimum	AM	None	None
Do Minimum	LT	None	None
Do Minimum	SR	None	None
Do Minimum	PM	None	None
Main Construction Closures Scenario	AM	Southern Peak	Northwood, Collins Avenue, Mater, St Stephen's Green
Main Construction Closures Scenario	LT	Southern Peak	Northwood, Collins Avenue, Mater, St Stephen's Green
Main Construction Closures Scenario	SR	Southern Peak	Northwood, Collins Avenue, Mater, St Stephen's Green
Main Construction Closures Scenario	PM	Southern Peak	Northwood, Collins Avenue, Mater, St Stephen's Green

Scenario	Time Period	Construction Vehicles	Road Closures and Lane Reduction
Dublin Enabling Works	AM	None	Dublin Enabling Works Closures
Dublin Enabling Works	PM	None	Dublin Enabling Works Closures
Swords Enabling Works (Signals)	AM	None	Swords Signals Enabling Works Closures
Swords Enabling Works (Signals)	PM	None	Swords Signals Enabling Works Closures
Seatown Closure	AM	Northern Peak	R132/ L2143 Seatown Rd/ L6310 Mantua Road - eastern arm left in/out only
Pinnock Hill Closure	AM	Northern Peak	Pinnock Hill Closure (Eastern Arm Closed)
Malahide Closure	AM	Northern Peak	R132/ R106 Malahide/ Drynam Road - reduction to a single lane approach on eastern arm
Estuary Closure	AM	Northern Peak	Estuary Closure - Northern R132/R125 - western arm left in/out only
Seatown Closure	PM	Northern Peak	R132/ L2143 Seatown Rd/ L6310 Mantua Road - eastern arm left in/out only
Pinnock Hill Closure	PM	Northern Peak	Pinnock Hill Closure (Eastern Arm Closed)
Malahide Closure	PM	Northern Peak	Malahide Closure
Estuary Closure	PM	Northern Peak	Estuary Closure - Northern R132/R125 - western arm left in/out only
Pinnock Hill Closure	LT	Northern Peak	Pinnock Hill Closure (Eastern Arm Closed)
Pinnock Hill Closure	SR	Northern Peak	Pinnock Hill Closure (Eastern Arm Closed)

9.6.1.1.5 Impact on Strategic Public Transport Network

There will be no significant impact to the operation of the Luas network at O'Connell Street and Charlemont Stations during the proposed Project Construction Phase. The Main Works construction period will result in the closure of two rail lines during the works. The Western Commuter Line (Maynooth to Docklands) will be closed for 21 months which the Southwestern Commuter Line (Maynooth and Phoenix Park to Connolly) will be closed for 5 months. As a result, the Western Commuter Line will terminate at Broombridge, and the Southwestern Commuter Line will terminate at Heuston Station.

Bus lanes are provided throughout most of the work areas, minimizing impacts on bus services. There will be some delays to bus journey times and scheduling at locations where the bus lanes are removed or where buses need to share with general traffic. Journey times will also be impacted by the removal of designated bus lanes at some locations, such as on approach/exit to junctions along the R132 Swords Bypass during the Main Works, however these will be short in duration. The impact on the public transport network is increase due to the presence of the Swords Express services increasing the sensitivity of the receiving environment, however there are no Significant impacts to public transport in this section.

Table 9.67 presents a summary of the Significant impacts on public transport during the Construction Phase. There are Significant impacts on the public transport network in AZ4 Northwood to Charlemont section only.

Table 9.67: Public Transport Network Significant Impacts

Link	Description	Sensitivity	Significance Impact
Western Commuter Line Maynooth to Docklands	Closure for 21 months	Very High- ability to interchange with rail lines serving the rest of Ireland	Short-term Significant Negative
South Western Commuter Line Maynooth and Phoenix Park to Connolly	Closure for 5 months	Very High- ability to interchange with rail lines serving the rest of Ireland	Short-term Significant Negative

9.6.1.1.6 Impact on Strategic Road Network

The road network will be impacted by the construction of all stations/sections associated with the proposed Project. Figure 9.9 presents the proposed haul routes to and from the sites. The M1 and M50 Motorway will be utilised as haul routes to access the spoil site. Chapter 5 (MetroLink Construction Phase) details the site access, with the STMP noting the respective haulage routes for each site.

The two Main Works Construction Period scenarios (closures in the central and southern sections, and closures in the northern sections) results were analysed to identify instances of either:

- An increase in flow greater than both 20 PCUs and 5% of the equivalent Do Minimum flow; and
- An increase in delay greater than three minutes.

9.6.1.1.6.1 Traffic Flow Impacts

Diagram 9.26 and Diagram 9.27 are based on the outputs from the Main Works 2028 AM modelling scenario. This shows the links that meet one of the criteria above, categorised by the percentage increase in flows.

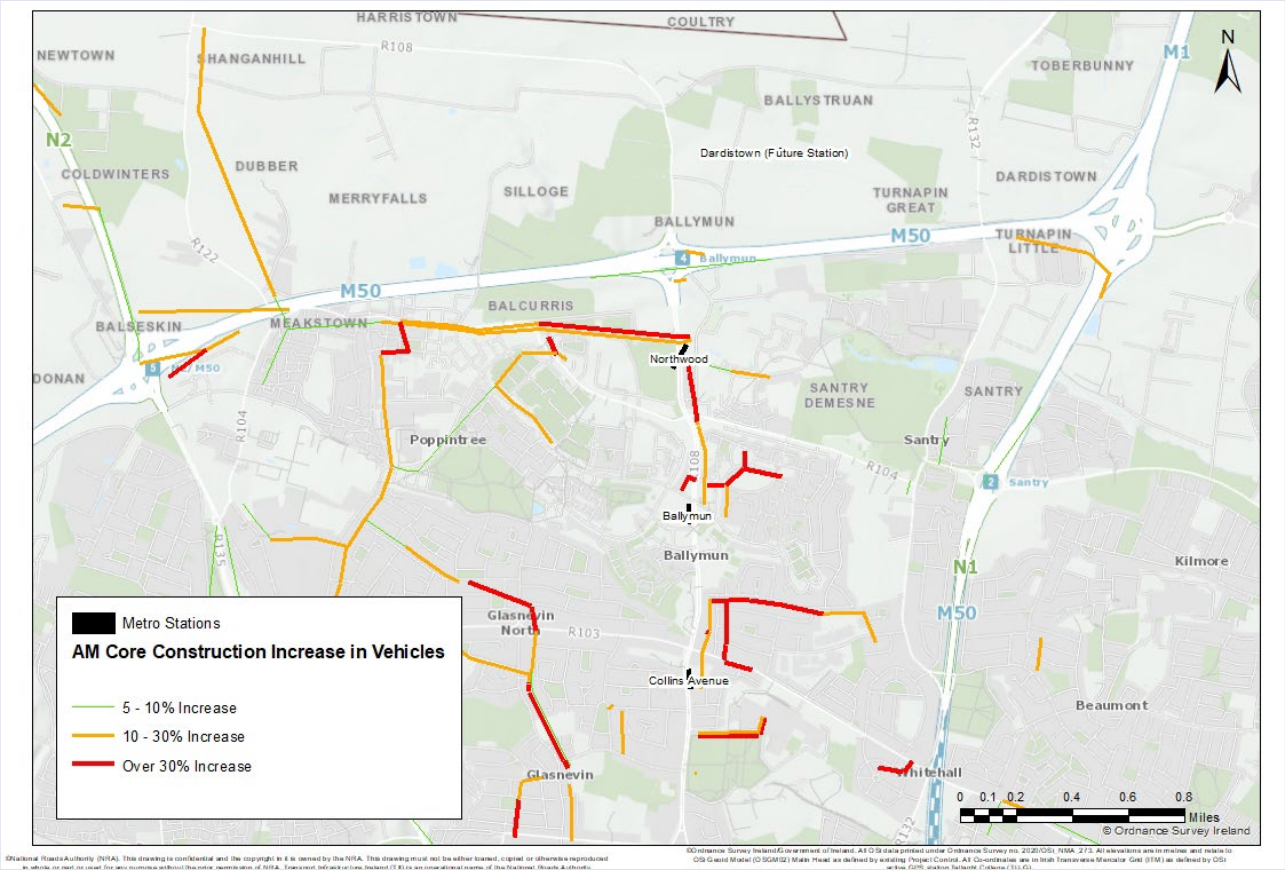

Diagram 9.25: AM Northern Dublin Main Works 2028 Construction Scenario Flow Changes

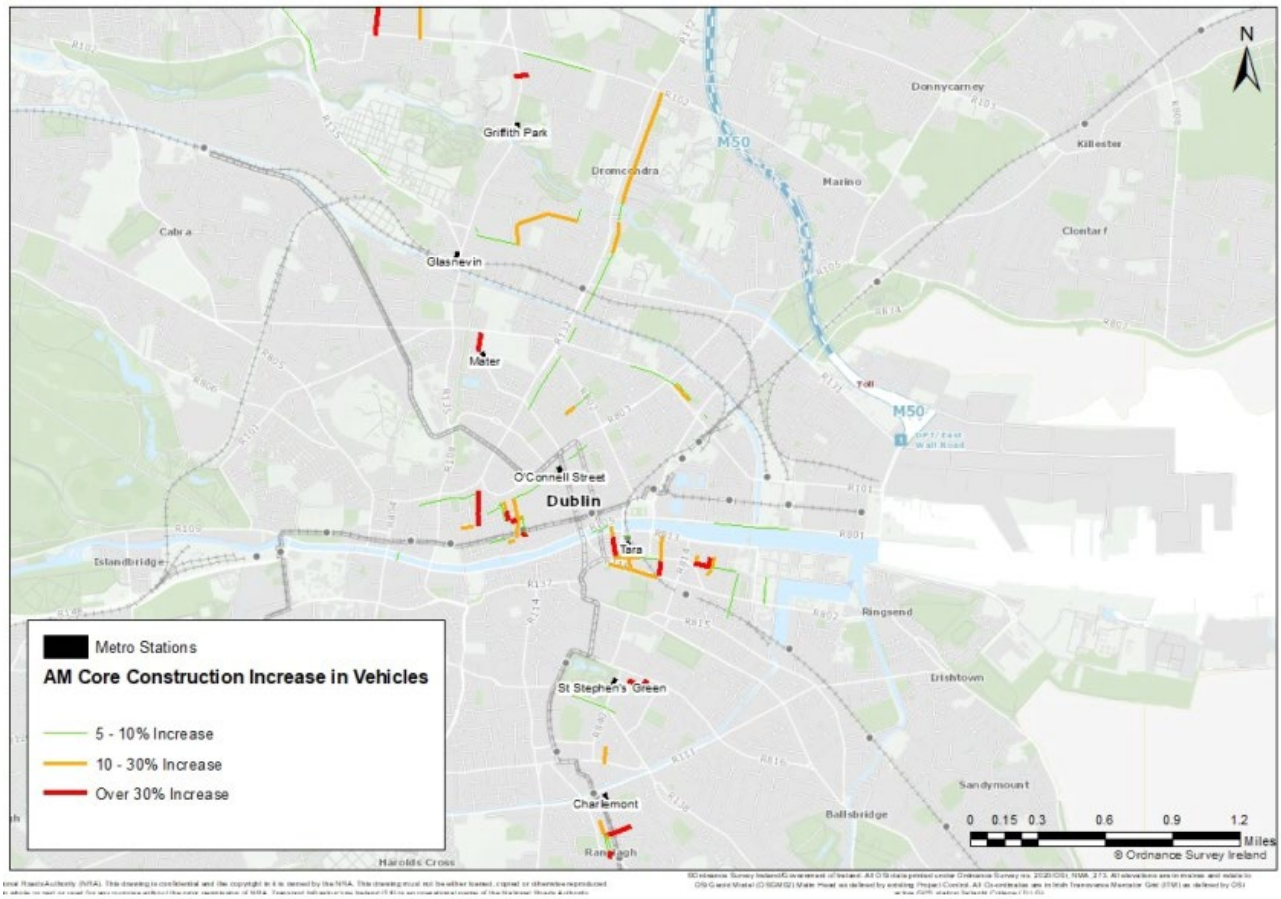

Diagram 9.26: AM Central Dublin Main Works 2028 Construction Scenario Flow Changes

This demonstrates that increases in traffic flows are expected to occur as result of the proposed Project's construction program during the AM peak in the northern section of AZ4 Northwood to Charlemont Section between the R108 and M50 Motorway Junction 6. This reflects traffic routing away from R108 Northwood routes due to the construction closure, lane loss and construction vehicle impacts, to alternative routes such as R104-St Margaret's Road, Coultry Road, Shanliss Road, Shanard Avenue and Ballygall Road East. In addition, sizeable increases occur on the R108 between the Ballymun and Northwood sites due to the addition of construction vehicles here outweighing other traffic routing away.

In Dublin City Centre there are also changes in traffic flows of over 30% in the vicinity of the Tara Station. Here the closure of Luke Street and of Poolbeg Street east of the R802 causes more traffic to route via surrounding roads, notably Hawkins Street and Shaw Street. In addition, to avoid closures and lane loss at the Charlemont, Mater and St Stephen's Green sites, re-routing occurs to certain side streets, which causes a high percentage growth due to the low levels of Do Minimum traffic on these streets. Particular re-routing occurs to Goldsmith Street near Mater, Hume Street near St Stephen's Green and Northbrook Road near Charlemont.

For the Construction Main Works 2028 PM modelling scenario, Diagram 9.28 and Diagram 9.29 below show the links that meet one of the criteria above, categorised by the percentage increase in flows.

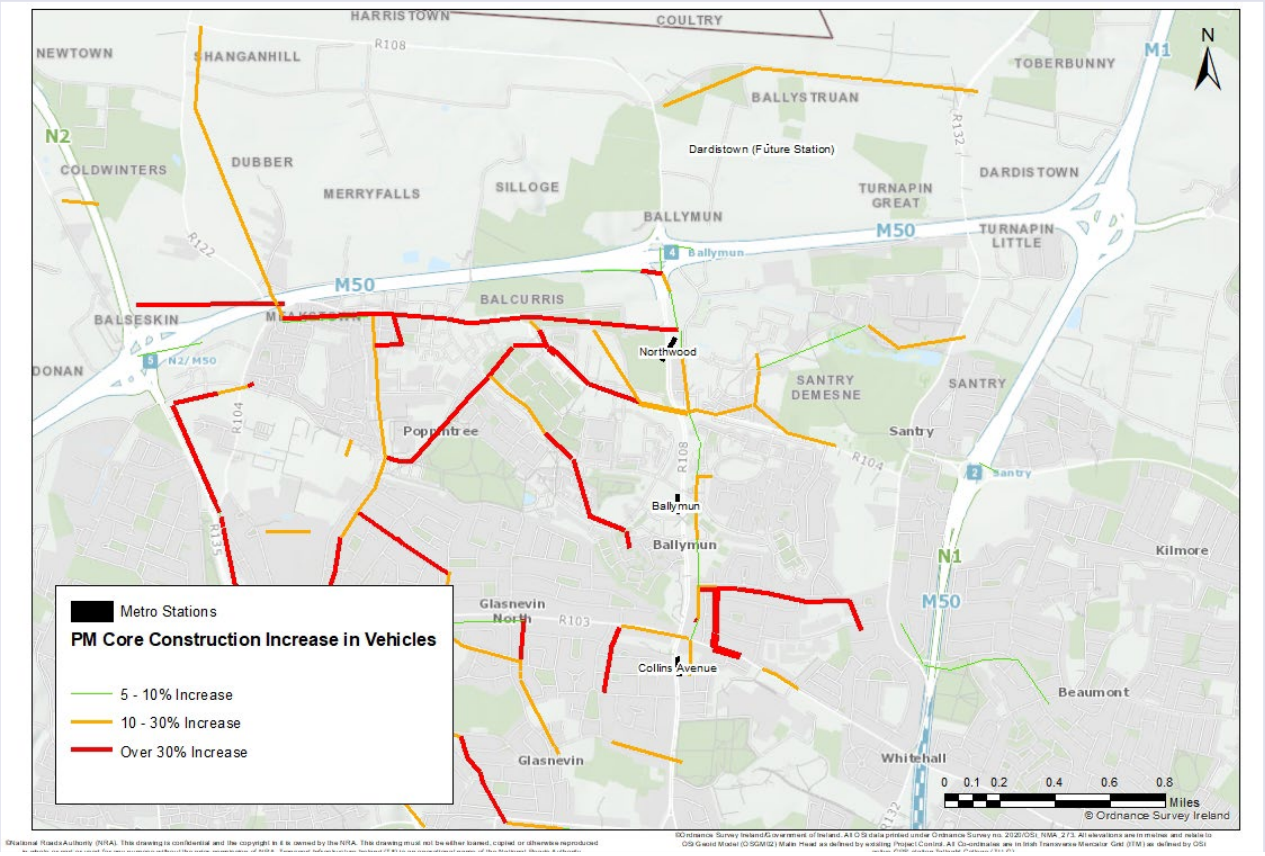

Diagram 9.27: PM Northern Dublin Main Works 2028 Construction Scenario Flow Changes

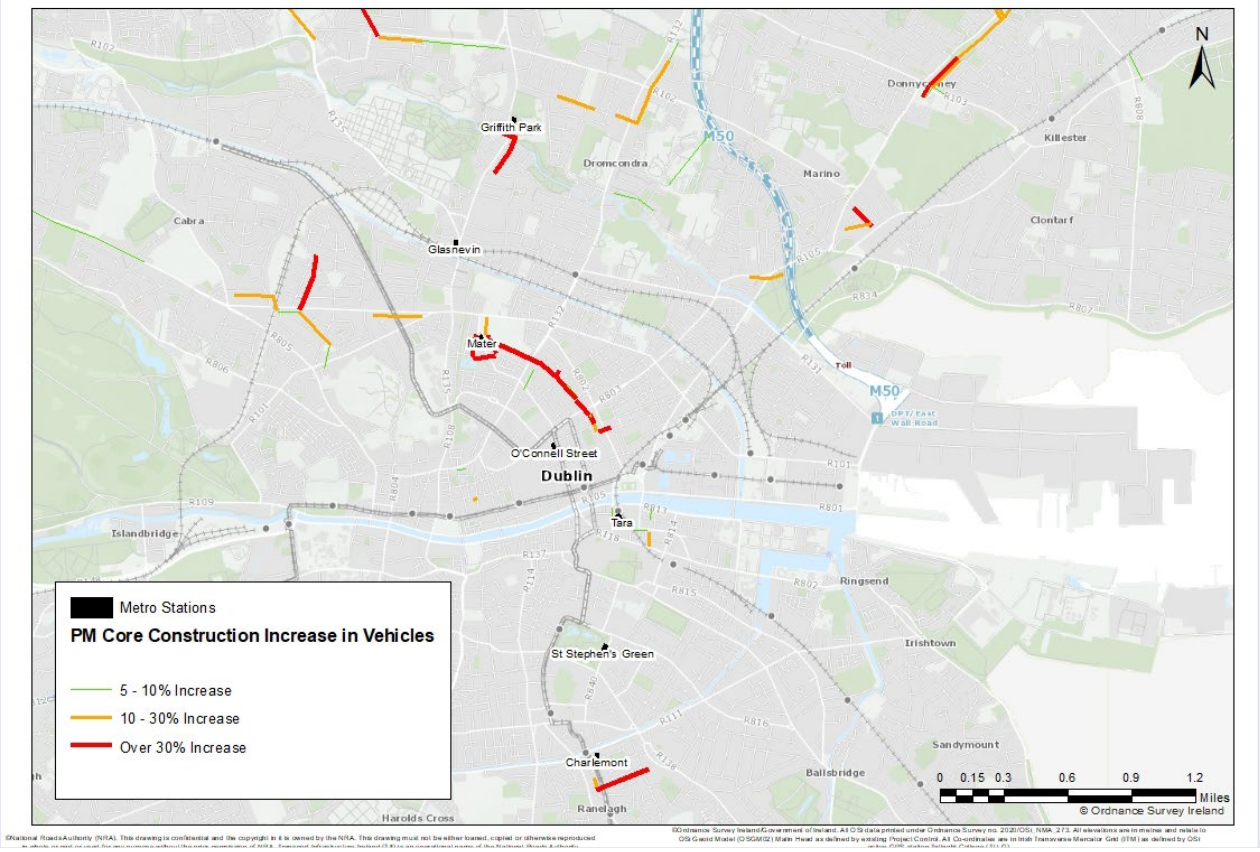

Diagram 9.28: PM Central Dublin Main Works 2028 Construction Scenario Flow Changes

This demonstrates that increases in traffic flows are expected to occur as result of the proposed Project's construction program during the PM peak in the northern vicinity between the R108 and M50 Motorway Junction 6. This reflects traffic routing away from R108 Northwood routes. Traffic reroutes to roads such as Jamestown Road, Balbutcher Lane, Northwood Avenue, Shanliss Road and Ballygall Road East. The low existing traffic flows on these roads means that a modest increase in vehicles produces an over 30% increase in vehicles. The impacts in central Dublin (Diagram 9.29) are highly localised, to where a road closure causes a large percentage increase in traffic across a short stretch of local road which is used as a diversion route. There is an extended increase along Eccles Street/Temple Street/Hill Street, due to the change in priority of the Eccles-Berkley Street junction causing traffic to re-route to this route.

Referring to the five modelled scenarios for the Swords closures, the STMP (Appendix A9.5) presents the percentage increase in vehicles for the traffic management proposals at Estuary junction, Seatown junction, Malahide Road junction, Pinnock Hill junction and the Airside junction respectively. The results demonstrate that the Swords closures causes increase on flows on parallel side-roads to the closed roads, due to traffic re-routing. This is particularly the case for the Airside, Pinnock Hill and Estuary closures and particularly in the AM peak period.

These impacts include:

- The Estuary "left-in left out" closure causing more traffic to route via Balheary Road and Swords Main Street instead of routing on to the R132 through the Estuary junction. In addition, more traffic routes via the Seatown Junction as an alternative to the Estuary junction.
- The Seatown "left-in left out" closure causes traffic to reroute away from Seatown Road through Mantua (the arm of the Seatown junction which is affected by the "left-in left out" closure). Traffic instead routes to parallel local roads (Estuary Road and Spittal Hill in the AM, the Seatown Road which access the R132 to the north of the Seatown junction in the PM) or stays on the R132 to the north of the Seatown junction.
- The Malahide Lane closure causes more traffic to stay on the R132 rather than routing via R106. There is an increase in the use of Estuary Road through Seabury as a parallel route to the R106. More traffic routes to the M1 Junction 4 rather than the M1 Junction 3.
- The Pinnock Hill closure causes more traffic to route to the L2300 Boroimhe Road, Airside junction and L2305 Nevinstown Lane as an alternative route to the closed road. There is an increase in traffic on the R132 to the south of Pinnock Hill junction, as traffic stays on the R132 rather than routing to the M1 Junction 3 through Pinnock Hill. There is an increase in traffic on the M1 north of Junction 3 as more routes via the M1 Junction 4 instead of Junction 3. In the AM the Pinnock Hill closure causes traffic to route away from the R132 to parallel roads such as Forest Road, due to increased delay at the Airside junction.
- In the AM for the Airside closure, traffic heading Airside Retail Park in the AM routes via a number of alternative routes, due to the limited capacity of the most direct diversion route via the Pinnock Hill junction. Traffic re-routes via the R132, R106, Forest Road, Mountgorry Road and Holywell, increasing traffic on these routes. In addition, more traffic stays on the M1 at junction 3 to route via Junction 4 instead, as per the Pinnockhill closure. In the PM impacts are more localised to the R132 and L2305 Nevinstown Lane.

9.6.1.1.6.2 HGV Increases

To assess the impact of the Project's construction phase on the volume of HGVs on the road network, the proportion of HGV vehicles in the Do Minimum SATURN model was subtracted from the same parameter in the Main Works SATURN Model, to produce a "change in percentage HGV". Thus, if five percent of vehicles were HGVs on a link in the Do Minimum and in a construction scenario eight percent of the vehicles were HGVs on the same link in the same time period, this would indicate a "change in percentage HGV" of three percent.

Links with an overall increase of flows of less than 20 vehicles were excluded. After this, these "changes in percentage HGV" were categorised as follows:

- Slight Impact: 0-2 percentage point increase in %HGV on link;
- Moderate Impact: 2-5 percentage point increase in %HGV on link; and

- Severe Impact: Over 5 percentage point increase in %HGV on link

The impacts of the Main Works 2028 Construction Scenario in terms of "changes in percentage HGV" are presented in the STMP (Appendix A9.5).

The results demonstrate that most of the increases are below 5%. In the north of Dublin there are increases of over 5% in both the AM and the PM peak period, principally on the M50 Motorway and N2 between the Northwood site and the Huntstown Quarry. This reflects the high number of construction vehicles routing to the spoil site at Huntstown Quarry via this route.

The impact assessment of HGVs during the construction in the Swords area is undertaken using the five Swords construction scenarios as outlined in Section 9.6.1.1.4 Modelled Closures. The analysis, presented in the STMP (Appendix A9.5) indicates that there some moderate increases in HGV proportions across all scenarios, primarily due to the additional construction vehicles, as well as some slight re-routing of other HGVs away from the R132. Only the Pinnock Hill closure, AM Seatown 'left-in left-out' closure and PM Malahide lane-loss scenarios have "severe" impacts of over a 5-percentage point increase in % HGV. In the Pinnock Hill closure scenario, during the AM peak, this is due primarily to the closure of the R125 causing the re-routing of HGVs to the R132 to the south of this junction, instead of routing via the closed R125 and the M1, via M1 Junction 3. In the Seatown "left-in left out" closure during the AM peak this reflects HGVs staying on the R132 north of the Seatown junction and routing on to the R125 to the west of the Estuary junction. In the Malahide lane-loss scenario, during PM peak this reflects HGVs routing via a less heavily trafficked route along Estuary Road and Seatown Road through Mantua, to avoid the Malahide junction.

9.6.1.1.6.3 Traffic Delay Impacts

The delay impact is shown in Diagram 9.30 and Diagram 9.31 below, this utilises the 2028 Main Works AM scenario and the 2028 Main Works PM scenario.

Diagram 9.29: AM Northern Dublin Main Works 2028 Construction Scenario Delay Changes

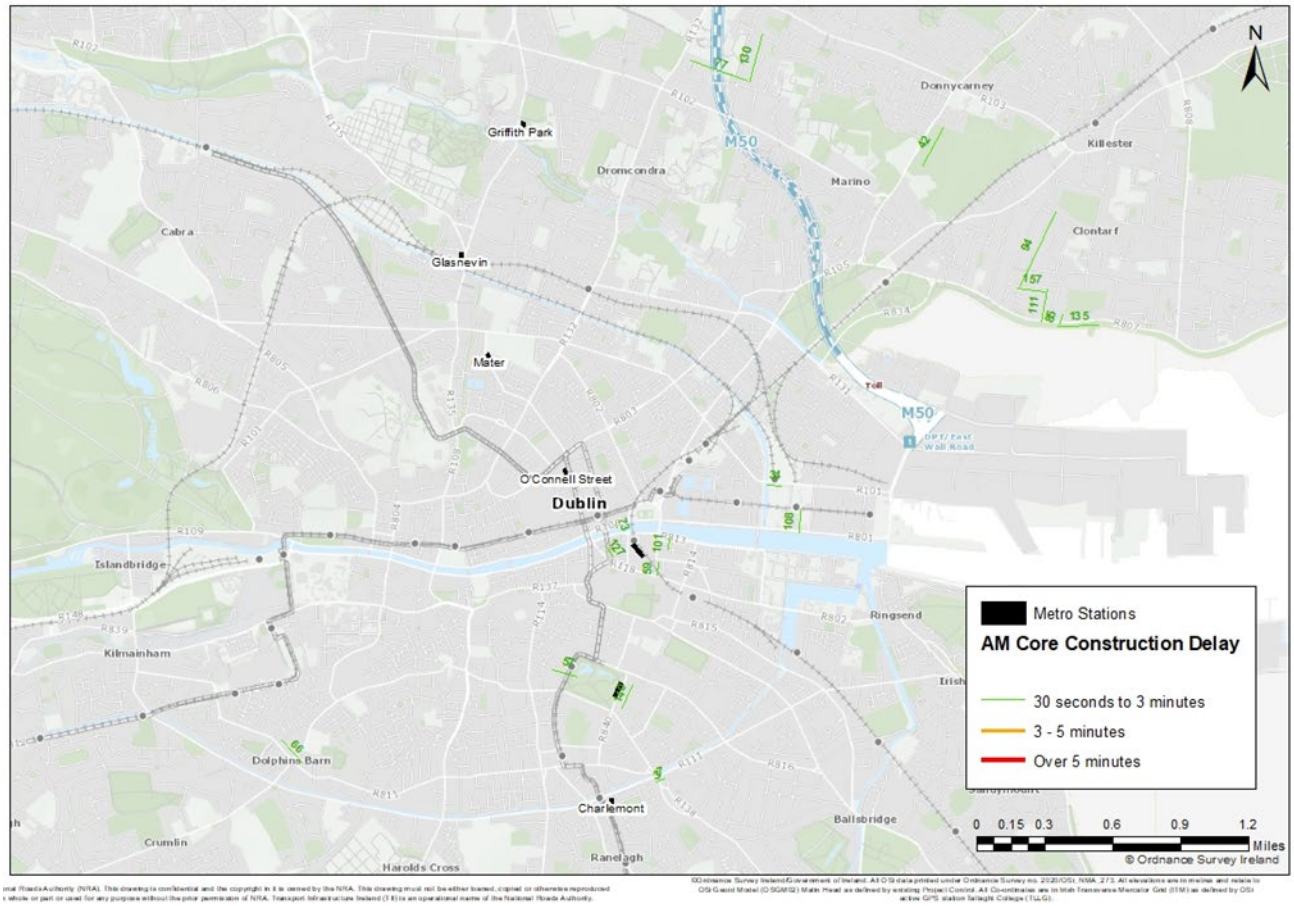

Diagram 9.30: AM Central Dublin Main Works 2028 Construction Scenario Delay Changes

This suggests traffic delays of up to three minutes in the AM resulting from the proposed Project's construction. In northern Dublin the main impact is at R108 Collins Avenue-R103 Junction, reflecting the loss of lanes on both the southern approach and exit to this junction, referred to Diagram 9.30. In Central Dublin, refer to Diagram 9.31 localised impacts are only seen in the immediate vicinity of the Tara and St Stephen's Green sites, reflecting closures and lane loss at these locations.

For the PM Main Works 2024 modelling scenario, the delay impact in Northern Dublin is shown in Diagram 9.32.

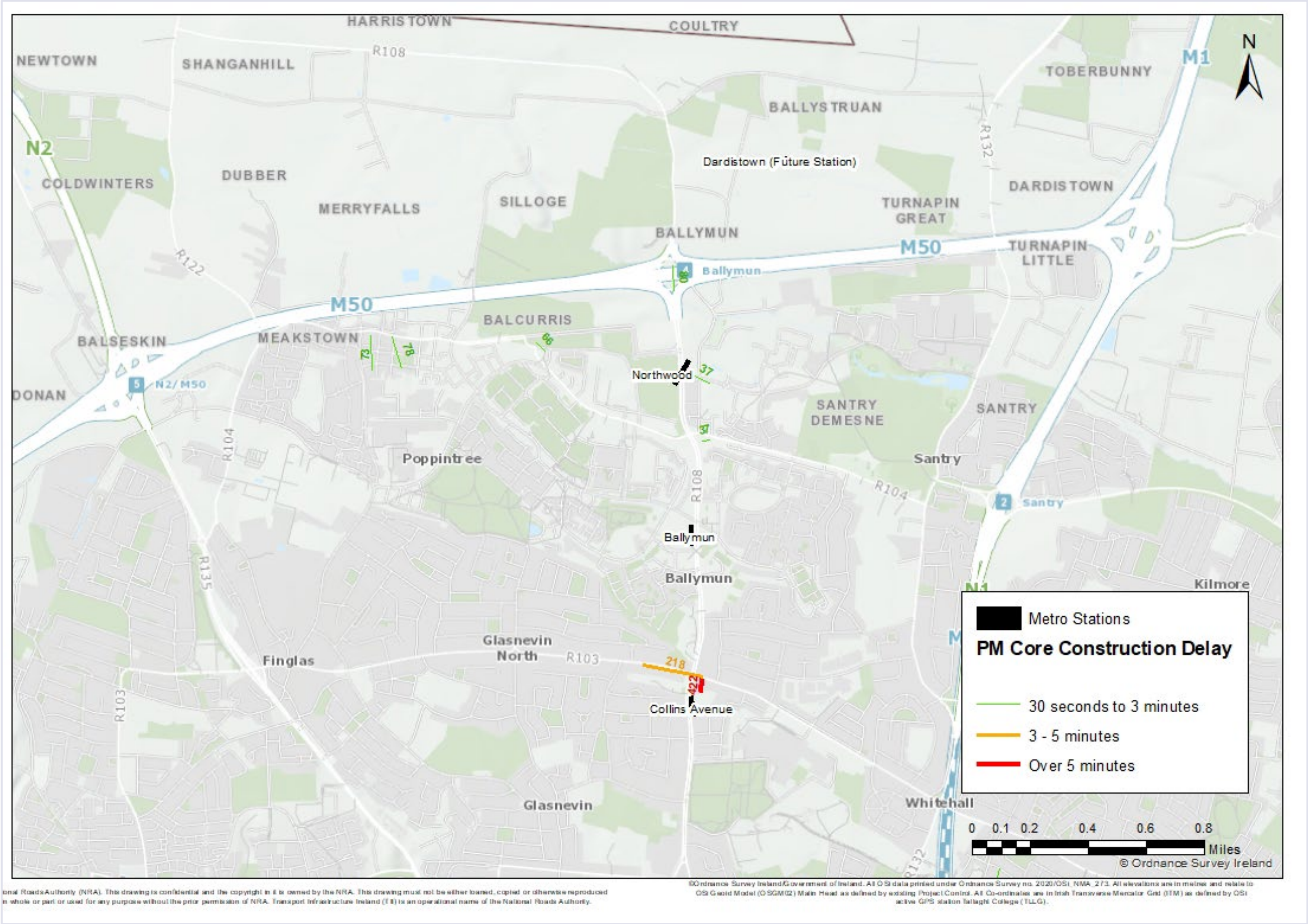

Diagram 9.31: PM Northern Dublin Main Works 2028 Construction Scenario Delay Changes

This demonstrates that in the PM peak there is a 3–5-minute delay predicted on the southern approach to the R108 Collins Avenue-R103 Junction, reflecting the loss of a lane on this approach as well as the closure of Albert College Drive to through traffic.

There are no delay increases of over one minute in Central Dublin in the PM peak period.

Figures showing the delays due to the Swords area closures can be found in the STMP (Appendix A9.5). Examining the journey time impacts found for modelling the five Swords closure scenarios, it was found that:

- The Seatown and Estuary "left-in left out" closures see delays of up to 3 minutes. An exception to this for the Estuary closure in the PM peak is over a 5-minute increase in delay for the eastern approach to the Estuary junction, which is already over-capacity in the 2028 PM Do Minimum. Also for the Seatown closure in the PM an increase in traffic accessing the R132 via the North Dublin Corporate Park access (to avoid the Seatown "left-in left out" closure to the north of this) causes a delay of 3-5 minutes.
- The Malahide "lane loss" closure only has slight delay impacts of up to 3 minutes.
- The Pinnock Hill closure and diversion causes more than a 5-minute increase in delay for the L2305 approach to the Airside junction as well as 3–5-minute delay increases for traffic on the southern R125 approach to the R125-L2305 roundabout.
- The Airside closure does not cause major delays during AM peak travel periods. In the PM peak period, there are moderate and severe increases in delay on priority action junctions on the L2305, reflecting an increase in opposing traffic on the L2305 westbound as well as traffic from the minor arm having to turn right rather than left out at the junction due to the Airside "left-out only" closure.

9.6.1.1.6.4 Route Journey Time Results

A number of journey time routes across Dublin were analysed to assess the impact of the construction closures on longer distance journey times. The routes analysed are shown in Diagram 9.33.

Diagram 9.32: Assessed Dublin Strategic Journey Time Routes

The results produced are shown in Table 9.68 below.

Table 9.68: Dublin Strategic Modelled Journey Times in 2028

		AM				PM			
Name	Direction	Do Minimum Journey Time	Construction Journey Time	Journey Time Change	Journey Time Percentage Change	Do Minimum Journey Time	Construction Journey Time	Journey Time Change	Journey Time Percentage Change
R135 Drumcondra-M50 J5	NB	11:48	11:51	*00:03*	*0.4%*	16:24	17:12	*00:48*	*4.9%*
1 R135 Drumcondra-M50 J5	SB	28:38	27:48	*-00:50*	*-2.9%*	18:25	18:32	*00:07*	*0.6%*
2 R108, R135, R103 Drumcondra-M50 J5	NB	20:00	20:23	*00:23*	*1.9%*	24:38	30:10	*05:31*	*22.4%*

2 R108, R135, R103 Drumcondra-M50 J5	SB	33:59	34:38	*00:40*	*1.9%*	26:31	30:13	*03:41*	*13.9%*
3 R108 Drumcondra-M50 J4	NB	16:40	17:03	*00:23*	*2.3%*	21:12	26:21	*05:08*	*24.2%*
3 R108 Drumcondra-M50 J4	SB	28:31	29:44	*01:12*	*4.2%*	17:02	17:08	*00:05*	*0.5%*
4 R108 R103 Drumcondra-Whitehall	NB	15:55	17:21	*01:26*	*9.0%*	21:15	25:26	*04:10*	*19.6%*
4 R108 R103 Drumcondra-Whitehall	SB	25:45	28:22	*02:38*	*10.2%*	17:20	17:30	*00:09*	*0.9%*
5 N1/R131 Junction - M50 J3 via R132	NB	21:05	21:21	*00:16*	*1.3%*	32:58	33:50	*00:51*	*2.6%*
5 N1/R131 Junction - M50 J3 via R132	SB	36:55	37:09	*00:14*	*0.6%*	19:43	19:41	*-00:01*	*-0.1%*
6 M50 J2 - M50 J5	WB	04:51	04:54	*00:03*	*1.1%*	05:03	05:03	*00:00*	*0.0%*
6 M50 J2 - M50 J5	EB	06:46	06:51	*00:04*	*1.1%*	05:59	06:01	*00:02*	*0.4%*

The table indicates that during the modelled AM peak the impacts of the proposed Project's construction on journey times are minor, with the only increase in journey time of over 2 minutes being on the R108-R103 route southbound from Whitehill to Drumcondra, mainly reflecting the lane southbound lane loss on the R108 to the south of its junction with the R103 causing increased delay for traffic from the junctions eastern R103 route.

In the modelled PM peak this has more notable impacts, primarily due to delays caused by the lane loss at the R108-R103 junction. The lane loss in both directions here, causes delays of approximately 4 minutes northbound for the routes passing through the R108-R103 junction.

In addition, analysis was conducted on the journey times on the R132 through Swords, between the M1 Junction 4 and the M1 Junction 2 (as shown in Diagram 9.34 below) for the Do Minimum and the five different Swords closure scenarios considered.

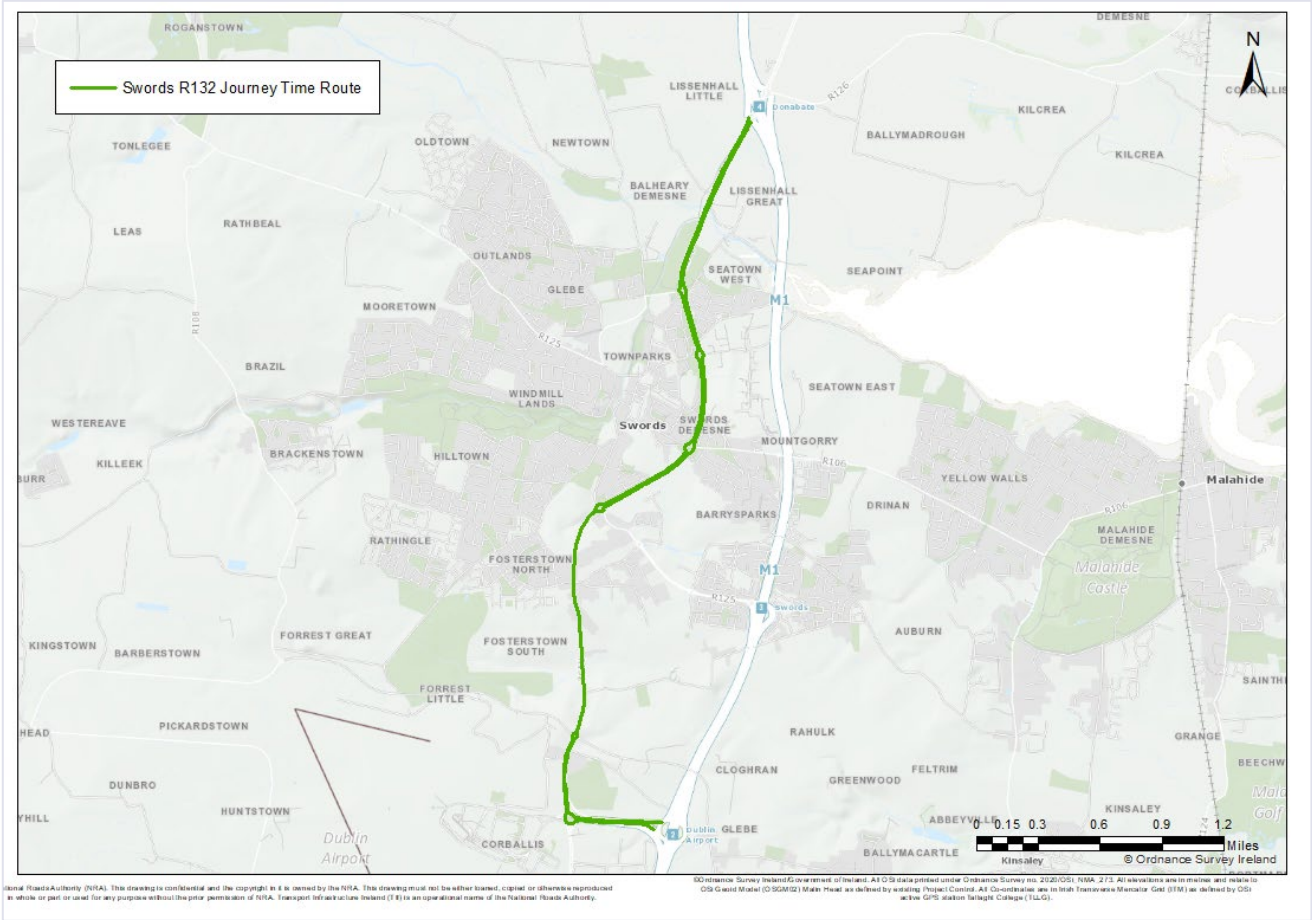

Diagram 9.33: Assessed Swords Strategic Journey Time Route

The results produced are shown in Table 9.69.

Table 9.69: Swords Strategic Modelled Journey Times in 2028

Scenario	Direction	AM Journey Time	AM Journey Time Change on Do Minimum	AM Journey Time Percentage Change	PM Journey Time	PM Journey Time Change on Do Minimum	PM Journey Time Percentage Change
Do Minimum	NB	21:18	*00:00*	*0%*	26:43	*00:00*	*0%*
	SB	20:18	*00:00*	*0%*	16:32	*00:00*	*0%*
Estuary Closure	NB	21:58	*00:40*	*3%*	29:05	*02:22*	*9%*
	SB	20:52	*00:35*	*3%*	12:31	*-04:01*	*-24%*
Seatown Closure	NB	21:42	*00:24*	*2%*	26:06	*-00:37*	*-2%*
	SB	19:09	*-01:08*	*-6%*	11:54	*-04:38*	*-28%*
Malahide Closure	NB	21:56	*00:38*	*3%*	25:36	*-01:07*	*-4%*
	SB	19:37	*-00:41*	*-3%*	14:03	*-02:29*	*-15%*
Pinnock Hill Closure	NB	21:22	*00:04*	*0%*	26:28	*-00:15*	*-1%*
	SB	21:08	*00:51*	*4%*	17:33	*01:00*	*6%*
Airside Closure	NB	23:00	*01:43*	*8%*	24:03	*-02:40*	*-10%*
	SB	18:30	*-01:48*	*-9%*	15:16	*-01:16*	*-8%*

These demonstrate that the largest journey time impact comes from the Estuary closure in the PM peak, with journey times increasing by almost 2 minutes and 30 seconds. This reflects an increase in delay on the northbound approach to this junction. In the PM peak, the Pinnock Hill closure causes an increase of 1 minute to journey times southbound, whilst the Airside Closure sees delays of 2 minutes 40 seconds northbound. For the Airside closure in the AM and the Pinnockhill closure in the PM, there are modest increases in delay reflecting increased demand on neighbouring junctions to the closure junctions, which traffic re-routes to.

9.6.1.1.7 Impact on Strategic Cycle Network

The cycle network will be impacted by the associated Construction Phase at most stations in AZ4 Northwood to Charlemont, however in most instances the impact is Slight. In the northern sections there is minimal cycling infrastructure present, limiting the severity of impact in these areas. Significant impacts on cyclists occur on the R108 Ballymun Road during the Enabling Works when cycle facilities are removed but not replaced, and at Royal Canal Way where there is a full section closure and diversion. As a result, the Construction Phase impacts the connectivity of the designated GDA Cycle Network at these locations.

9.6.1.1.8 Impact on Strategic Pedestrian Network

The pedestrian network will be impacted by the associated Construction Phase in each of the sections, however in most instances the impact is Slight due to the provision of diversions or additional crossings to ensure movements and pedestrian desire lines are maintained. Moderate negative impacts on pedestrians will occur in all of the geographical sections, with the exception of the AZ1 Northern Section. This is due to the increased significance and sensitivity of the pedestrian network towards Dublin City Centre.

9.6.1.2 Local Level Impacts

Chapter 5 (MetroLink Construction Phase) details each of the Construction Compounds along the alignment during the Construction Phase. The STMP (Appendix A9.5) provides further details on the local modelling impact assessment at each of the sites. At each location, the assessment is presented for:

- Public Transport Users;
- General Traffic (Road Users);
- Pedestrians;
- Cyclists; and
- Parking and Loading.

9.6.1.2.1 AZ1 Northern Section

This section of the chapter presents a description of the impacts on the public transport, road, pedestrian, cycle and parking network in the AZ1 Northern Section (Estuary to DANP) during the Construction Phase. The stations within this section include:

- Estuary Station and Park and Ride Facility;
- Seatown Station;
- Swords Central Station; and
- Fosterstown Station.

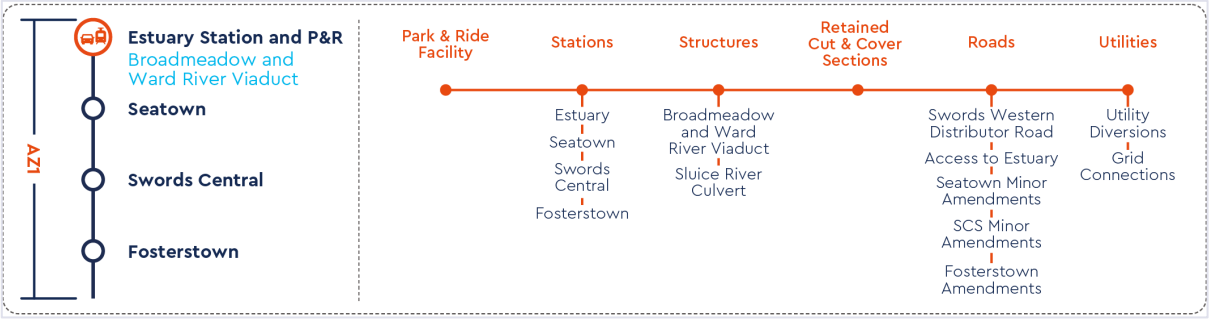

Diagram 9.34: AZ1 locational and Features

Further details on the Construction Phase impacts can be found in the STMP (Appendix A9.5), and Chapter 5 (MetroLink Construction Phase).

The AZ1 Northern Section consists of four main construction sections: Estuary to Seatown Station, Seatown Station to Malahide Roundabout, Malahide Roundabout to Pinnock Hill Roundabout, and Pinnock Hill Roundabout to DANP. A full description of the sections of retained cut, cut and over and open cut within the AZ1 Northern Section can be found in Chapter 4 (Description of the MetroLink Project).

The associated construction sites within this section include:

- Estuary Station /Park and Ride construction and logistics site;
- Estuary Junction crossing construction site;
- R132 Crossing North construction sites (Seatown West Satellite and Estuary Court);
- Estuary Court;
- Woodie's construction site;
- Mantua Park construction site;
- Seatown Station;
- North Dublin Corporate (NDC) construction site;
- Chapel Lane;
- Malahide Junction Crossing site;
- Swords Central construction site, including lorry holding site;
- Pavillions Satellite Compound;
- Pinnock Hill Junction;
- Nevinstown Lane and Fosterstown Station construction site; and
- R132 Crossing South and Boland construction site.

The STMP (Appendix A9.5) assesses the impact of the proposals, detailing the proposed traffic management approaches, including realignments and access/egress arrangements for the various construction sites identified in Chapter 5 (MetroLink Construction Phase).

The R132 Connectivity Project is expected to be in place before the construction on the Project begins, which includes a renewed focus on safe facilities for pedestrians and cyclists on the R132. As such, the impact assessment undertaken within this report assumes that the proposed infrastructure changes on the R132 and surrounding area, associated with the R132 Connectivity Project, will be in place.

BusConnects is expected to be complete before the Project construction phases begin. It will deliver infrastructure to separate buses and cyclists from other traffic to make sustainable travel a faster, safer and more reliable choice. BusConnects will also develop interchange hubs and improve pedestrian facilities around bus stops. The impact assessment detailed in the following sections assumes that the proposed infrastructure changes in the AZ1 Northern Section, associated with BusConnects, will be in place.

All construction works in the AZ1 Northern Section have been developed and phased with the aim of avoiding simultaneous road diversion and/or closures at the four major junctions along the R132 Swords

Bypass, namely the Estuary, Seatown Road, Malahide Road and Pinnock Hill junctions. Diagram 9.36 illustrates the construction sequencing proposed for the AZ1 Northern Section.

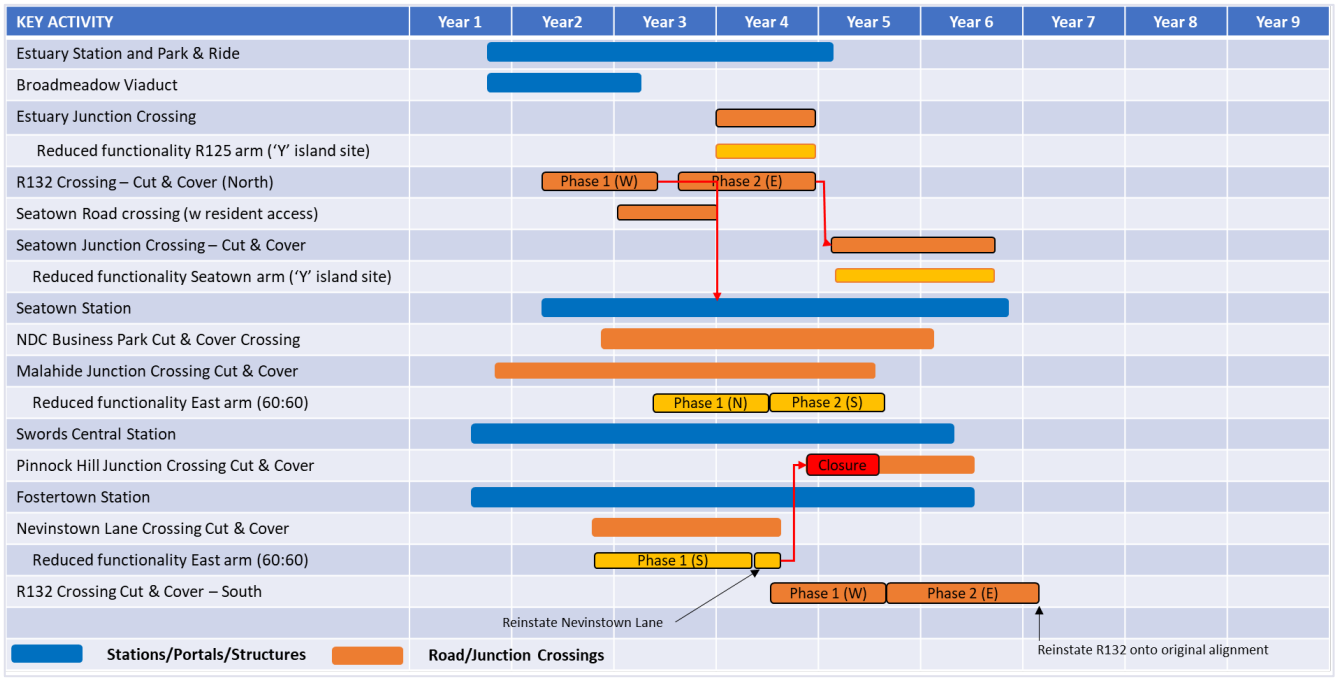

Diagram 9.35: Construction Sequencing in the AZ1 Northern Section

A selection of alternative routes within the AZ1 Northern Section have been identified to reduce the volume of traffic that is moving throughout the Construction Phase. The promotion of these alternative routes for traffic will form part of the construction traffic management for the Project and has the potential to decrease congestion by 30%. These movements are designed to improve movements within the local areas.

These routes will primarily be promoted through a combination of signage including static signage, variable signage and community publicity. While these routes will be encouraged throughout the duration of the Construction Phase, none of the following analysis takes into consideration these impacts, and should these reductions be achieved, the following identified impacts will be further reduced. The temporary traffic management timeline spans across 6 years with local area closures and areas of reduced capacity changing per scenario. The STMP (Appendix A9.5) presents the alternative routing for the AZ1 Norther Section.

9.6.1.2.1.1 Public Transport Construction Impact Assessment

The STMP (Appendix A9.5) details the magnitude of impacts to the public transport network during the construction scenario. The presence of the Swords Express in this section increases the sensitivity of the public transport network to changes in journey times or bus stop locations. A summary of the significance of the impacts presented in Table 9.70, taking into consideration the magnitude of the impact, as presented in the STMP (Appendix A9.5), and the sensitivity of the location as identified in Section 9.5.2 Local Level Baseline Conditions.

Table 9.70: Summary of Construction Impact on Public Transport Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R132 Swords Bypass	Partial removal of bus lanes on R132 and reduction of capacity on Estuary Junction	Medium- duration of 2-4 weeks	Medium- Swords Express Route not present at this section	Short-term Moderate Negative
Seatown Junction	Loss of bus lane on R132 northbound and southbound approach arms	Low- duration of 2-4 weeks	High- presence of Swords Express	Short-term Slight Negative
Malahide Junction arms	Loss of bus lane on R132 northbound and southbound approach arms.	Low – Partial loss	High- presence of Swords Express	Short-term Slight Negative
Malahide Junction Bus Stops	Relocation of bus stops during Phase 1	Low- temporary relocation	High- presence of Swords Express	Short-term Slight Negative
Pinnock Hill Junction	Bus services will be diverted during the weekend/evening works	Low – weekend and night time closure	Medium- limited services at night time	Short-term Slight Negative
R132 Bus stops- Pinnock Hill Junction	Relocation of bus stops 3696 and 3675	Low- bus services maintained	High- presence of Swords Express	Short-term Slight Negative
Main Works				
Estuary Station	Installation of two new signalised junctions along the R132. Relocated bus stop 3714, north of existing location	Low- bus services maintained	High- presence of Swords Express	Short-term Slight Negative
Estuary Junction	Service route to be diverted causing slight increase in journey time	Low- services maintained but slight increase in journey time	High- presence of Swords Express	Short-term Slight Negative
R132 Crossing North	R132 capacity partially reduced to two lanes in each direction, removal of hard shoulder	Low- partial reduction	High- presence of Swords Express	Short-term Slight Negative
R132 Crossing North	Relocation of bus stop 6359 along realigned carriageway during both phases	Low-Bus services maintained	High- presence of Swords Express	Short-term Slight Negative
Estuary Court	No proposed TTM	Imperceptible- no proposed TTM	High- presence of Swords Express	Short-term Slight Negative
Seatown Junction and Station	Delays and increased journey times due to diversions and route alterations	Low – services maintained but slight increase in journey time due to alterations	High- presence of Swords Express	Short-term Slight Negative
Malahide Junction	Removal of eastbound bus lane on east arm	Medium- removal of lane and reduced capacity, delays of	High- presence of Swords	Short-term Moderate Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
		5mins	Express	
Pinnock Hill Junction	Full closure of R125 south arm	Medium- impact to journey times	Low – no bus services route between Pinnock Hill Junction and Airside Roundabout	Short-term Slight Negative
R132 Swords Bypass	Bus lane infrastructure retained on R132 and R125 north lanes	Low- infrastructure maintained	High- presence of Swords Express	Short-term Slight Negative
L2305 Nevinstown Lane	Closure of L2305 arm causing disruption of public transport services	Medium- delays to services of approx. 2mins	High- presence of Swords Express	Short-term Moderate Negative
L2305 Nevinstown Lane	Some stops along L2305 to be relocated or removed as they are close to the construction area	Medium- temporary relocation	High- presence of Swords Express	Short-term Moderate Negative
R132 Crossing South	Realigned bus lanes retained during all phases	Low- bus stops relocated along R132	High- presence of Swords Express	Short-term Slight Negative

Estuary to Seatown Section Enabling Works

During the Enabling Works at Estuary Junction, journey times for public transport will likely increase due to the partial removal of one lane in each direction along the R132. The northbound and southbound bus lane on the R132 between Estuary Junction and M1 Junction 4 will be partially closed in sections for 2-4 weeks. The services impacted by the construction phase on this section are Service 33 operated by Dublin Bus; including 33a; 33b; and 33e, and Service 101 operated by Bus Éireann.

There will be a moderate disruption caused by the capacity reduction on Estuary Junction. This will cause delays to services running through Estuary Junction. The services impacted by the works on Estuary junction include Service 33 and 101, but also Service 500 and 503 (operated by Swords Express), Service 43 and 41 (both operated by Dublin Bus).

Estuary Station Main Works

The Main Works associated with Estuary Station will have a slight impact on public transport services and infrastructure. The partial reduction of lane capacity along this section is expected to result in minor delays to bus services. The services impacted by the construction phase on this section are Service 33, 41, 43 operated by Dublin Bus; including 33a; 33b; 33e; 41c; 41d; 41x and Service 101 operated by Bus Éireann. Bus services 500; 500X; and 503 operated by Swords Express are also affected.

Estuary Junction Main Works

Bus services will be moderately disrupted by the diversions put in place during the main works Phase 2 TTM. The TTM design of Estuary Junction allows for bus services to turn right from the R132 southbound to the R125 westbound, which results in minimal journey time disruption southbound bus services on the R132. The following services will experience diversions due to this TTM:

- 43 Northbound – This route will need to divert along the Seatown Road, resulting in services not stopping at bus stops 3711, 3712 and 6359. People alighting at these stops will need to alight at bus stop number 7114, resulting in an approximate 400m-long diversion for passengers from stop 3711 and a 500m-long diversion for users of stops 3712 and 6359. Data from the NTA indicates that 736 bus passengers per midweek day will be impacted by this. Diagram 9.37 shows this diversion.

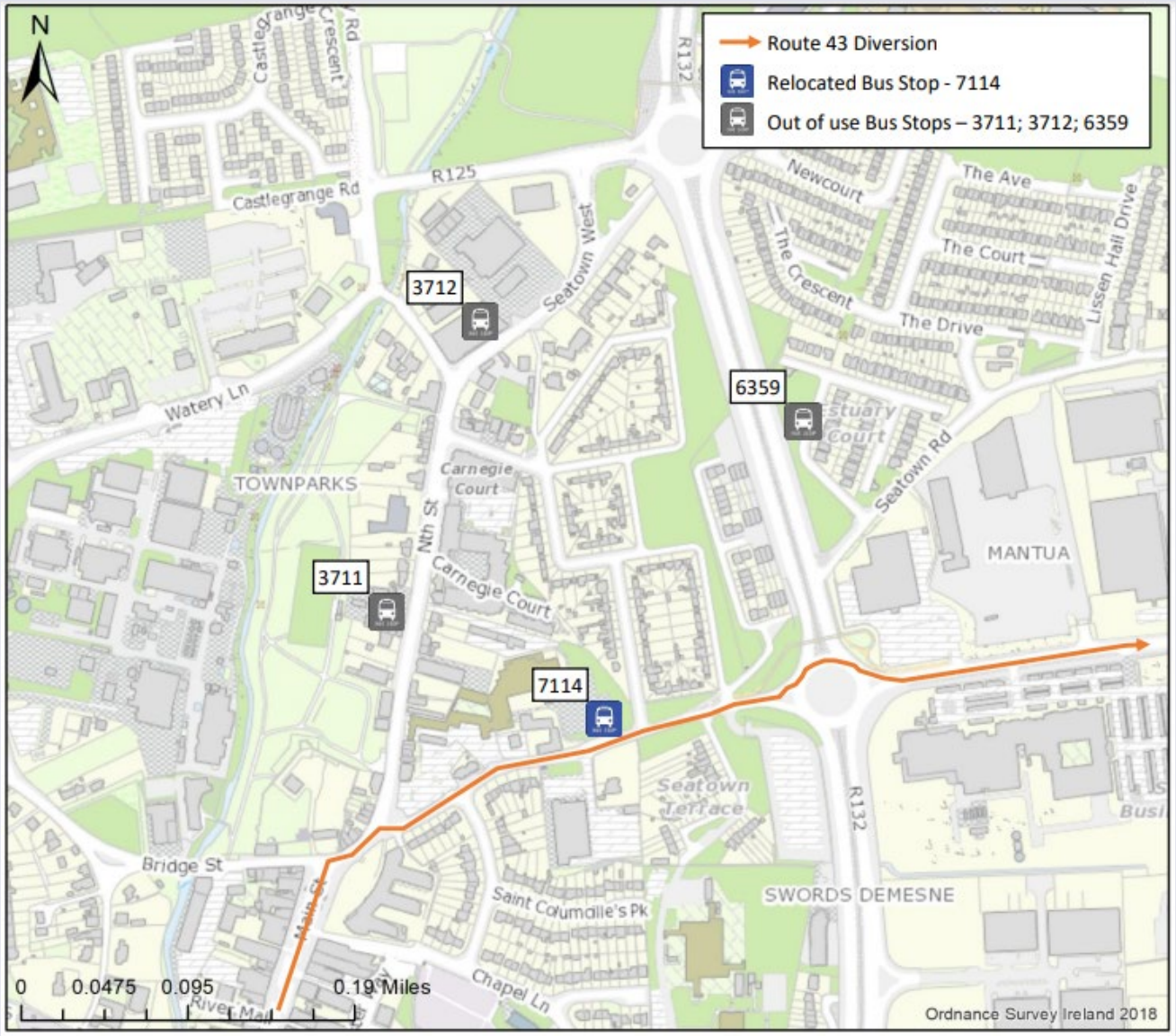

Diagram 9.36: Northbound Diversion of Bus Route 43

- 43 Southbound – This will need to divert down the R132, resulting in no route 43 services stopping at bus stops numbered 4433, 3752, 3751, 3689, 3690 and 6117. People alighting at these stops will need to alight at replacement bus stop number 7116 or the existing route 43 stops 5044 and 3655. This would result in a 350m-long diversion to stop 5044 for users of stop 4433, 750m for users of stop 3689, and 800m for users of stops 3752 and 3751. There would also be a diversion of 800m for users of stop 3690 and 450m for users of stop 6117 in order to reach stop 3655. Data from the NTA indicates that at least 539 bus passengers per midweek day will be impacted by this. Diagram 9.38 shows this diversion.

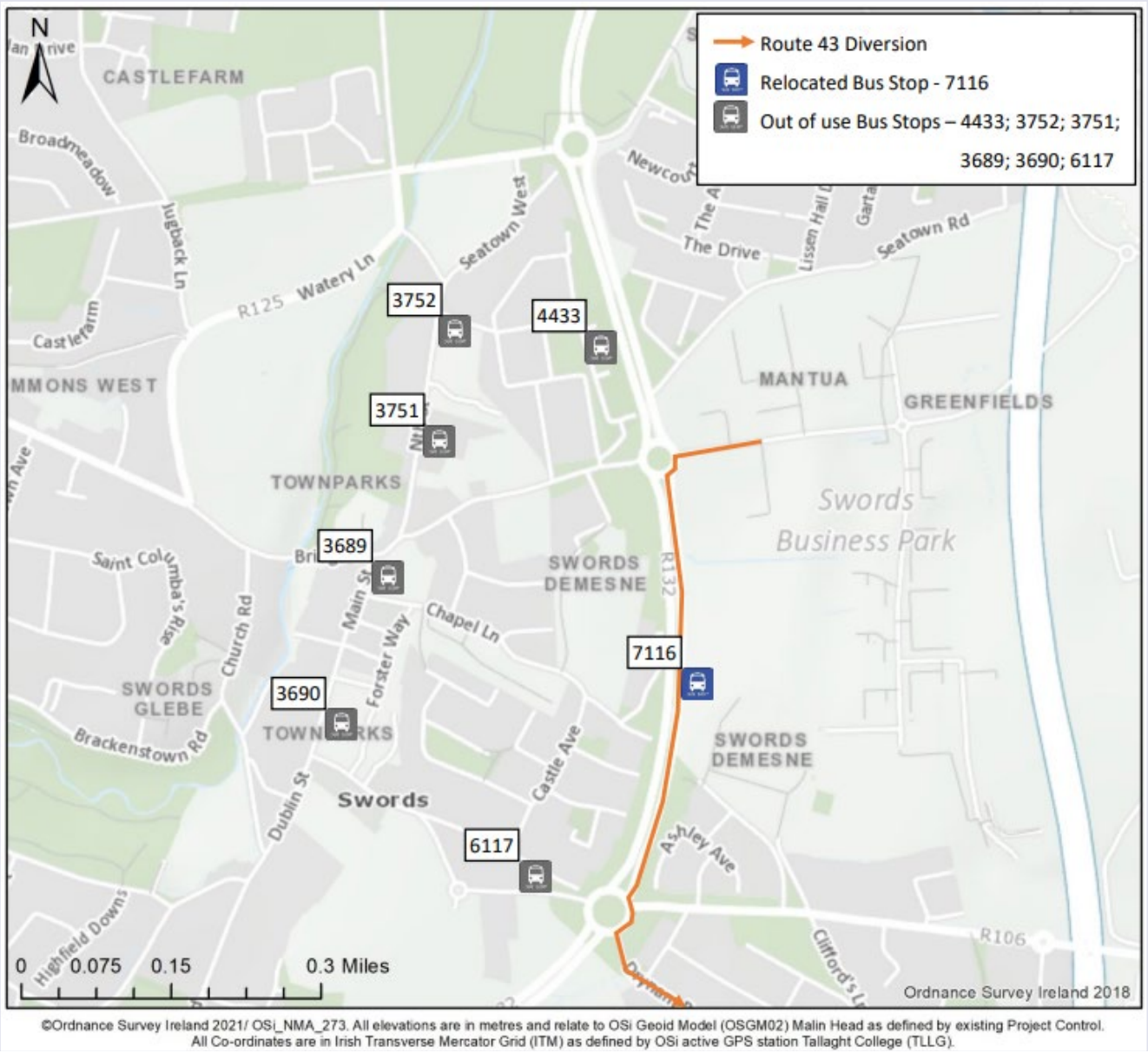

Diagram 9.37: Southbound Diversion of Route 43

- Swords Express Services Southbound (500, 503, 507, 500x) - These services will either need to use the U-turn to the north of the Estuary Junction or divert along Watery Lane and onto Seatown Road, this diversion is shown below in Diagram 9.39. The diversion down North Street will result in passengers using the stop at Seatown Road (6359) having to use stop 7114 or a temporary stop to the south of the Seatown junction. This will mean an approximate 400m diversion.

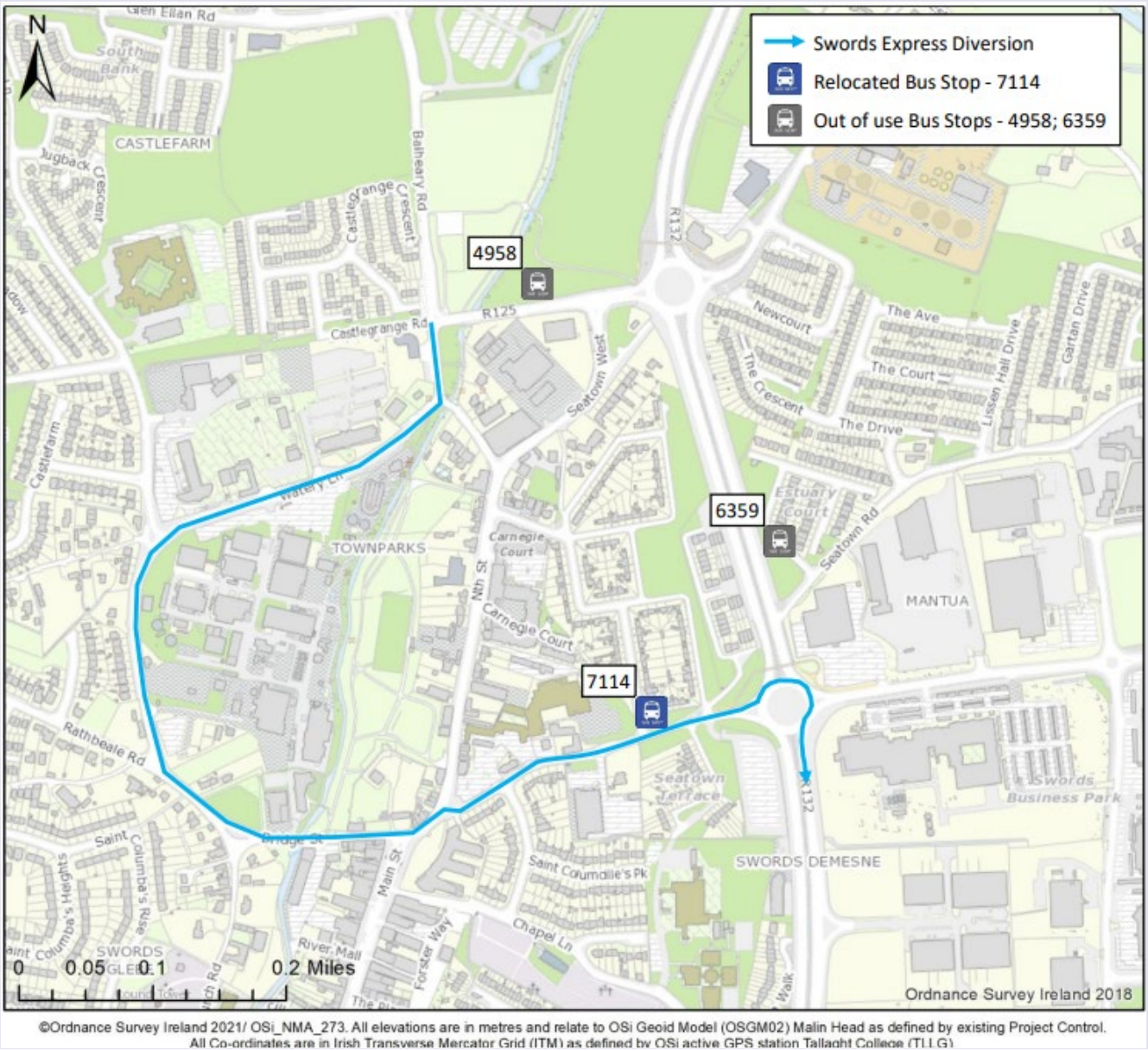

Diagram 9.38: Southbound Diversion for Swords Express Routes

The works associated with Estuary Signalised junction will have a slight impact on public transport services and infrastructure. The TTM in place along this section is expected to result in a small increase journey times for bus services. The provision of the bus only right turn from the R132 will ensure that the no diversions are required for the Dublin Bus services travelling from the north towards Swords.

The services impacted by the construction phase on this section are Service 33, 41, 43 operated by Dublin Bus; including 33a; 33b; 33e; 41c; 41d; 41x and Service 101 operated by Bus Éireann.

Considering BusConnects routes, the L83/L85 service (Local route) will utilise the dedicated right-turn from the R132 to the R125 on its southbound routeing, while the northbound route will remain unaffected by the TTM. This diversion also affects Service 21 (Other City Bound route).

R132 Crossing North Main Works

The partial removal of the hard shoulder on the R132 during both phases of works will only result in a slight delay for services along the R132. The TTM during both phases retains a designated space for the bus stop in both directions to allow services to stop without affecting other road users.

The works associated with R132 North Crossing will have a slight impact on public transport services and infrastructure. The reduced capacity along this section is expected to result in minor delays to bus services. The services impacted by the construction phase on this section are Service 33, 41, 43 operated by Dublin Bus; including 33a; 33b; 33e; 41c; 41d; 41x and Service 101 operated by Bus Éireann. Bus services 500; 500X; and 503 operated by Swords Express are also affected.

There are no proposed diversions for future BusConnects routes, however the TTM will result in a slight increase in journey times for all services routeing between Estuary and Seatown junctions on the R132.

Seatown Station to Malahide Junction Enabling Works

There will be a partial loss of bus lane along the R132 on the southbound and northbound Seatown Junction approaches, causing a slight impact and delay for bus journey times in the area. The bus lanes are impacted during each Phase 1 sub-phase. Bus stops in the vicinity of this station are unaffected.

There are several bus services impacted by the construction works on this section. These include Service 41, 43 operated by Dublin Bus and Service 102 operated by Bus Éireann. Bus services 500X; 503 and 507 operated by Swords Express are also affected.

Estuary Court Main Works

There will be a short-term Slight Negative impact on public transport services in the area caused by the construction sites in this section. The Main Works associated with Estuary Court will have a slight level of impact on public transport services and infrastructure, according to the STMP ratings. The services impacted by the construction phase on this section are Service 41, 43 operated by Dublin Bus and Service 102 operated by Bus Éireann. Bus services 500X and 507 operated by Swords Express are also affected.

Seatown Junction and Station Main Works

Bus services will be slightly disrupted by the diversions put in place during the Main Works Phase 2 TTM. The proposed U-turn facility on the R132 between Malahide and Lissenhall Junction would reduce the impact caused by the diversion and minimise the impact on journey times of the bus services.

The works associated with Seatown junction will have a slight level of impact on public transport services and infrastructure.

The existing services in the vicinity of the works are likely to be slightly impacted by the delays caused by construction works on this section. These include Service 41, 43 operated by Dublin Bus and Service 102 operated by Bus Éireann. Bus services 500X; and 507 operated by Swords Express will also affected.

The services that will require a diversion are route number 43 (Dublin Bus) and several Swords Express routes. Route 43 currently commences service at the Seatown Road, east of the Seatown junction. The service then turns right at Seatown Junction and proceeds northward to the Estuary junction where it turns left and then turns left again onto North Street and then Main Street. It continues on Main Street until the R106 junction where it turns left and continues to the Malahide Junction.

Considering BusConnects routes, the Service 21 (Other City Bound route) will be required to use the diversion via the U-turn on the R132 during its southbound route. This will result in generally a slight increase in journey times for both services.

NDC Compound Main Works

The Main Works TTM at this section did not progress to the Stage 2 STMP Impact Assessment and are envisaged to have no impact on public transport services.

Malahide Junction to Pinnock Hill Junction Enabling Works

There will be a partial loss of bus lane along the R132 on the southbound and northbound Malahide Junction approaches, causing a slight impact and delay for bus journey times in the area. The bus lanes on the R132 are impacted during each Phase 1 sub-phase, while the bus lanes on the R106 are impacted during each Phase 2 sub-phase.

Bus stops 5074 and 5079 in the vicinity of this station are impacted during Phase 1.1 and 1.3 and will need to be temporarily related to the south of their current location on the R132.

The works associated with Malahide junction will have a slight level of impact on public transport services and infrastructure. The loss of a bus lane along the R132 in this section is expected to result in minor delays to bus services. The services impacted by the construction phase on this section are Service 41, and 41b operated by Dublin Bus and Service 101 and 101X operated by Bus Éireann. Bus services 500X operated by Swords Express are also affected.

Malahide Junction Main Works

The works associated with Malahide junction will have a moderate level of impact on public transport services and infrastructure. The loss of a bus lane and reduced capacity along the eastern arm in this section is expected to result in moderate delays for bus services which route along this road (currently services 102, 506 and 43). As there are bus lanes on approaches of the other arms, it may be possible to revise the signal timings to increase the green time of the R106 and thus decrease the delay and queuing that occurs on this arm. This would have minimal impact on other PT services but would impact on general traffic. The highest delay (close to 5 minutes) will be experienced during the AM peak period, for buses heading towards Swords, all other time periods show much less delay.

The services impacted by the construction phase on the R132 include Service 41, and 41b operated by Dublin Bus, services 101 and 101X operated by Bus Éireann and services 500X operated by Swords Express. The impact on these services is expected to be minimal.

Considering BusConnects routes, the Service 21 (Other City Bound route) will be directly impacted by the delay and will result in generally an increase in journey times for the service on its inbound route only. Service 21 is proposed to operate at a frequency of every 30 minutes, therefore in order to mitigate this delay, increased green time to the R106 east arm could result in a reduction in delays to the service.

Services 197, L89 and X84 will also be impacted by the TTM works at the junction, however these are expected to be minimal.

Swords Central Station Main Works

The Main Works TTM at this section did not progress to the Stage 2 STMP Impact Assessment and are envisaged to have no impact on public transport services.

Pavillions Satellite Compound Main Works

The Main Works TTM at this section did not progress to the Stage 2 STMP Impact Assessment and are envisaged to have no impact on public transport services.

Pinnock Hill Junction to North Portal Enabling Works

Public transport services will be impacted during the Enabling Works and will require some short-term diversions. The road closures during phases 1.2 and 1.3 (detailed in STMP, Appendix A9.5) and restricted movements during phases 3.3 and 3.4 are all over the weekend or at nights, and thus are awarded a slight impact rating in the STMP assessment.

The works associated with Pinnock Hill junction to North Portal section will have a slight level of impact on public transport services and infrastructure. The weekend diversions in place and the bus stop

relocations along the R132 in this section is expected to result in minor delays to bus services. The services impacted by the construction phase on this section are Service 33 and 41; including 33a and 41d operated by Dublin Bus and Service 101 and 197 operated by Bus Éireann. Bus services 500 and 504 operated by Swords Express are also affected.

During the Enabling Works at this section there will be a slight impact on bus stops where stop 3696 and 3675 will have to be relocated to the south of its existing location on the R132 during phases 1.1/3.5 and 1.3/3.2 respectively.

Pinnock Hill Junction Main Works

The main works will have a moderate impact on the public transport provision, specifically for services which utilise the R125 between Pinnock Hill and Airside Roundabout. There will be some increase in journey times for the services routing via Nevinstown Junction as there will be an increase in traffic volume at this junction, attributed to proposed diversion. Retention of bus lanes on approach to the junction will mitigate the impact of the expected delays, along with temporary traffic management changes such as banning the left turn from the L2305.

The services potentially impacted by the construction phase on this section are Service 33 and 41; including 33a and 41d operated by Dublin Bus and Service 101 and 197 operated by Bus Éireann. Bus services 500 and 504 operated by Swords Express are also impacted.

There are no proposed alterations to existing bus stops.

Future BusConnects Service 197 (Local route) will be required to use the diversion via Nevinstown junction, as will the evening peak only service Swords Express 500x. Services which route through this junction will likely be slightly impacted by the delays; including Spine Route A4, local services L83/L85/L89 and peak time route X84.

Nevinstown Junction Main Works

The main works will have a moderate impact on the public transport journey times. Bus journey times will be impacted as diversions via Pinnock Hill Junction are likely to cause delays of close to 2 minutes. The works along the R132 and Nevinstown Lane will impact two bus stops (7115 and 7210) which have to be moved temporarily during the construction period, onto the R132 or the R125.

The works associated with Nevinstown Junction will have a moderate level of impact on public transport services and infrastructure. The services impacted by the construction phase on this section are Service 33 and 41; including 33a and 41d operated by Dublin Bus and Service 101 and 197 operated by Bus Éireann. Bus services 500 and 504 operated by Swords Express are also affected.

R132 South Crossing Main Works

Public transport infrastructure is realigned during both phases of works; however, the capacity is retained as bus lanes a present on both sides of the road.

Bus stops 3675 and 3696 along R132 will have to be relocated during each phase, however both relocations are less than 100m from their existing locations.

Boland Compound Main Works

Main Works at the Boland Compound did not progress to the full Stage 2 Impact Assessment and are envisaged to have no impact on public transport services.

9.6.1.2.1.2 General Traffic Construction Impact Assessment

For this section, calculations for construction vehicle numbers are combined from nine main sites: Park and Ride facility, Estuary Station, Start to Seatown Station alignment, Seatown Station, Seatown Station

to Malahide Roundabout alignment, Swords Central Station, Malahide Roundabout to Pinnock Hill Roundabout alignment, Fosterstown Station and Pinnock Hill Roundabout to DANP alignment. Table 9.71 presents a summary of the construction vehicles numbers associated with the construction sites in this section. The daily range of movements are noted, however much of the Construction Phase has daily movements below this range.

The STMP (Appendix A9.5) provides details of the proposed haulage route for the construction vehicles.

Table 9.71: Construction Vehicles Movements in AZ1 Northern Section

Construction Vehicles	Total	Average Daily Range	Maximum Daily Movements	Duration of Maximum Weekly Movements
Park and Ride, Estuary Station and Start of Alignment to Seatown Station	~202,000 movements	100 to 400 movements, 30% of total construction period, daily movements will be below 50 movements per day	594 movements for one day	2,580 movements for approximately 1 week
Seatown Station, and Seatown Station to Malahide Roundabout Section	~76,000 movements	50 -400 movements per day, much of the construction period has movements below 50 per day	404 movements per day for approximately 1 day	1,376 movements for approximately 1 week
Swords Central Station, and Malahide to Pinnock Hill Roundabout	~57,000 movements	100 -250 movements per day, much of the construction period has movements below 50 per day	316 movements per day for approximately 1 day	1,250 movements for approximately 1 week
Fosterstown Station, and Pinnock Hill Roundabout to DANP	~77,000 movements	<50 movements per day, movements above 300 per day for 6 days only	338 movements per day for 1 day	1,404 movements for approximately 1 week

The STMP (Appendix A9.5) details the impacts to the road network during this scenario, with a summary of the significance of the impacts presented in Table 9.72.

Table 9.72: Summary of Construction Impact on General Traffic

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R132 Swords Bypass southbound on Estuary Junction	Single lane removed in each direction on R132 south of Estuary Junction during single phase.	Medium- 24min delay	Medium- Regional Road Network	Short-term Moderate Negative
Seatown Junction	Loss of lane on junction arms along R132 in both directions	Medium- closure for up to 4 weeks	Medium- Regional Road Network	Short-term Moderate Negative
Seatown Road (West)	Seatown Road (west) full closure - weekends	Low- nights/weekend closure	Medium- Regional Road Network	Short-term Slight Impact
Malahide Junction	Loss of lane on junction arms	Medium- partial reduction in capacity	Medium- Regional Road Network	Short-term Moderate Impact

Link	Description	Magnitude	Sensitivity	Significance of Impact
Pinnock Hill Junction	Short-term lane closures throughout various phases along the R1132 and Nevinstown Junction	Low- 1min 25s delay on Nevinstown Junction	Medium-Regional Road Network	Short-term Slight Impact
Main Works				
Estuary Station	Installation of two new signalised junctions along the R132 and realignment of existing road and space	Low- 23% increase in flows in AM, 17% reduction in PM	Medium-Regional Road Network	Short-term Slight Negative
Estuary Junction	Loss of turning movements to and from the R125 (west) junction arm	High- 52%increase in traffic on R132	Medium-Regional Road Network	Short-term Significant Negative
Estuary Junction	Loss of turning movements to and from the R125 (west) junction arm	High – 1-2km diversion for local access	Medium-Regional Road Network	Short-term Significant Negative
Ennis Lane	Closure of Ennis Lane, which links the R132 to Balheary Road	High- full closure leads to 2.6km diversion	High- Local Road Network	Short-term Significant Negative
R132 Crossing North	R132 capacity partially reduced to two lanes in each direction	Low – partial capacity reduction	Medium-Regional Road Network	Short-term Slight Negative
Estuary Court	New priority junctions on Seatown Road minor) providing access to Estuary Court Site and Woodies Site	Low – addition of new priority junction	Medium-Regional Road Network	Short-term Slight Negative
Seatown Junction and Station	Reduced capacity on all arms of Seatown Junction including the loss of turning movements to and from Seatown Road (East) junction arm	High- all arms impacted and loss of turning movements	Medium-Regional Road Network	Short-term Significant Negative
Seatown Junction	Restrictions of movements on Seatown Junction	High – 1-2km diversion for local access	Medium-Regional Road Network	Short-term Significant Negative
Malahide Junction	Junctions realigned on east side. Reduced capacity on east arm on approach and when exiting the junction	Medium- increase in traffic flows of up to 30%	Medium-Regional Road Network	Short-term Moderate Negative
R125 Airside Retail Park	Full closures of the R125 south arm during Main Work. Reduced general traffic lane on R132 southbound on approach to junction and R132 northbound on approach to junction	High-81% increase in traffic volume on R132 southbound between Pinnock Hill Junction and Nevinstown	Medium-Regional Road Network	Short-term Significant Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
		Junction		
Nevinstown Junction	Closure of southern arm at Pinnock Hill Junction results in 1.5km diversion	High- 1.5km diversion	Medium- Regional Road Network	Short-term Significant Negative
Nevinstown Junction	Closure of L2305 arm. Existing 4 arm junction reduced to 3 arms, with a left-out slip onto R132 southbound, south of the junction	High- loss of one arm of junction	Medium- Regional Road Network	Short-term Significant Negative
L2305 Nevinstown Lane	Closure of L2305 causing approx. 1.4km diversion to Pinnock Hill Junction/Airside Junction	High- 1.4km diversion	Medium- Local Road closure but impacts on Regional Road Network	Short-term Significant Negative
R132 Crossing South	Reduction in road width and alignment but no loss of capacity	Low- no loss of capacity	Medium- Regional Road Network	Short-term Slight Negative

Estuary to Seatown Station Enabling Works

The Enabling Works at Estuary junction will take place over a period of approximately 11 to 20 weeks and will be split into three phases, each at a separate location. A worst-case model scenario was used which captured the most impactful phase of works; this scenario includes a reduction in lane capacity on the R132 approach arms, north and south, to the Estuary Junction and a reduction of lane capacity along the R132 between Estuary and Seatown junctions.

The model indicates Enabling Works will have a significant impact on the general traffic movements in the local area, specifically caused by the works around the signalised Estuary Junction, however due to the short nature of works this results in a moderate impact rating. The lane reduction on the R132 southbound causes significant delays in both the morning and evening peak period, resulting in traffic routing towards minor and local roads to bypass the junction.

During the morning peak period the majority of traffic utilises local roads to the west of the R132, while in the PM peak there is also a 5% increase in traffic using the M1 southbound between Junction 3 and 4. The majority of Seatown Junction arms see a reduction in traffic volume in both peak periods, however, there are some increases in volume on the Seatown east arm on approach to the junction in the morning peak and on exit of the junction in the evening peak.

During the morning peak period the majority of traffic utilises local roads to the west of the R132, while in the PM peak there is also a 5% increase in traffic using the M1 southbound between junction 3 and 4. The largest link delay in both the morning and evening peak period is on the R132 southbound approach arm on Estuary Junction, where there are delays of approximately 24 minutes and 6 minutes respectively.

There will be no forced diversions or full road closures that will impact local access in the vicinity of the station area.

Estuary Station Main Works

Estuary Station main construction compound will be in place for approximately four years and four months and the majority of the Main Works will take place away from the road network. There will be temporary traffic management required in relation to the construction of the site access. There will be three phases of TTM during the construction period of this site access and this is expected to take place over approximately 1 month.

A model scenario was used which captured the most impactful phase works; this scenario includes the addition of two new signalised junctions on the R132 and updated lane capacity to accurately reflect the TTM. The impacts captured also take cognisance of the TTM in place for Estuary Junction and the R132 Crossing (north).

The TTM in place at Estuary Station site access results in a slight impact to flow difference in the area. Along the R132, during the morning peak, when the new signalised junctions are in place, there is no change to flow heading southbound. In the northbound direction, there is an increase of 23%. In the evening peak, there is no difference in flow when heading southbound and a decrease in flow occurs northbound of 17%. This redistribution of traffic is the result of the TTM at Estuary Junction which is resulting in road users finding alternative routes to avoid concurrent TTM in the area. There are no notable links showing driver delay as an issue during this scenario. There are small increases in delay on approach to the new signalised junctions, which is expected with the stop time associated with the signal cycle.

There is a slight impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that during the morning peak, there is an increase in HGV volume of 3% northbound along the R132 during the morning peak and 1% in the evening peak.

The closure of the Ennis Lane/R132 priority junction will result in an approximate 2.6km diversion via Estuary Junction. This closure will be in place during the full duration of station construction and will be subject to an alternative diversion when additional TTM is in place at Estuary Junction.

During the period that Estuary Station construction phase are ongoing, Estuary Junction TTM is also in place. During Estuary Junction Phase 2 TTM the right turn from the R132 southbound onto the R125 will be closed for general traffic and diversions will be in place. This will result in a 3.9km diverted journey time with traffic routing via North Street.

Estuary Junction Main Works

The TTM in place during Phase 2 results in a Significant increase in traffic flows at some locations. Along the R132, during the morning peak, when the new signalised junctions are in place, there is minimal change to the traffic flow heading southbound. In the northbound direction, there is an increase in flow of between 23-52%. In the evening peak, there is again minimal difference in flow when heading southbound and a decrease in flow occurs in the northbound lane of 17% to the north of Estuary Junction.

The restricted movements from the R125 onto the R132 southbound and Spittal Hill result in an approximate decrease of 44% in traffic volume on the R125 approach arm in the morning and a 59% decrease in traffic flow in the evening.

This redistribution of traffic is the result of the TTM at Estuary Junction which is resulting in road users finding alternative routes to avoid the TTM in the area. Roads around the signalised junctions will have changes in traffic flow. During both the morning and evening peak there are decreases in traffic flow along the R125 in both directions and on North Street in the southbound direction only due to the restricted movements on the Estuary Junction approach arms. There is an increase in traffic flow on Seatown Junction and Seatown Road, where vehicles are using this area to reroute.

The change in traffic flow caused by the Estuary Junction TTM results in some slight increases in driver delay at Seatown Junction, Balheary Road and North Street.

There is a Moderate impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that during the morning peak, there is an increase in HGV volume of 1% southbound and 3% northbound on the R132 and in the evening peak, an increase of 1% southbound northbound. There are some increased HGV movements on the roads surrounding the signalised junctions, between 8-16% (Balheary Road) during the morning peak, and 4% (Estuary Road) in the evening.

The restricted movements to and from the R125 arm of Estuary Junction will result in an approximate 1km diversion for southbound movements and 2km diversion for westbound movements. As part of the R132 Connectivity Project one new junction will be built on the R132, south of the Estuary junction to facilitate safer pedestrian and cycle crossings, but also to allow for traffic to perform U-turns. The U-turn facilities are provided at the R132 between Malahide and Seatown Junction to facilitate movements from the R132 southbound to northbound.

To facilitate movements further, the Project will provide a U-turn facility along the R132 between Estuary and Lissenhall Junction to facilitate movements from the R132 northbound to southbound, the exact location of this U-turn will be decided with FCC.

The two U-turn facilities will allow traffic impacted by the Estuary Junction closures to stay on the R132 for the entirety of the diversion, minimising the need to use local roads in the Swords area. Furthermore, additional mitigation in the form of diversion signage and the banning of the right turn from the R125 to North Street for general traffic, will further encourage road users to utilise the R132.

The footbridge here provides general access across the R132 Sword Bypass and also functions to link the Balheary Park playing pitches, to the Fingallian's GAA club. The use of the bridge becomes redundant by the proposed upgrade of the R132 Swords Bypass through this area with signalised crossings to be maintained as the removal of the bridge and other proposed project works are progressed. An alternative safe pedestrian crossing will be provided prior to demolition of the bridge. The enabling works for the footbridge removal and associated traffic managements will require one overnight road closure on the R132 Swords Bypass, and therefore the impact to road users is Negligible.

R132 Crossing North Main Works

At this section along the R132 where there is a slightly reduced capacity on both carriageways, on the southbound carriageway there is a 5% or 6% increase in traffic volume in the morning and evening peak respectively, reflecting a slight impact. On the northbound carriageway there is a more significant increase of 52% in the morning peak and in the evening peak, there is a decrease of 17%. The cause of this redistribution of traffic is the result of the worst-case scenario, where all TTM in the Estuary section is in place in the model and is primarily caused by the restrictions in place at Estuary Junction.

There are no notable links showing driver delay as an issue in the immediate vicinity of the R132 crossing works, with a delay of 51 seconds recorded along Seatown Road (minor), westbound during the morning peak and an increase of 64-69 seconds on the west arm approach to Seatown Junction.

There is a moderate impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that the worst-case scenario is in the morning peak on the R132 northbound to the south of Estuary Junction and shows an increase of 3% in HGV volume caused by the cumulative construction works in this section, representing an 10-13% share of all traffic.

Seatown Station to Malahide Junction Enabling Works

The model indicates Enabling Works will have a significant effect on the general traffic movements in the local area, specifically caused by the works around the signalised Estuary and Seatown Junction, however due to the short nature of works this results in a moderate impact rating. The lane reduction on the R132 southbound and northbound shows minimal driver delay in both the morning and evening peak period, however this is primarily due to the significant amount of traffic which has routed away from the R132 due to the simultaneous works at Estuary and Malahide Junctions, and along the R132.

During the morning peak period the majority of traffic utilises local roads to the west of the R132, while in the PM peak there is also a 5% increase in traffic using the M1 southbound between Junction 3 and 4. The majority of Seatown Junction arms see a reduction in traffic volume in both peak periods, however, there are some increases in volume on the Seatown east arm on approach to the junction in the morning peak and on exit of the junction in the evening peak.

The significant delay on the R132 southbound approach arm on Estuary Junction, to the north of Seatown Junction, is one of the primary causes of the reduction in traffic volume at Seatown Junction (approximately 41% reduction in volume southbound in the morning peak and 60% reduction in the evening peak), and thus is the reason there is limited driver delay impact around the Seatown junction area.

The impact of site traffic and HGV flows are not considered as part of the Enabling Works assessment.

There are no significant diversions or road closures proposed as part of the TTM that will impact local access in the vicinity of the works area. Closure of the Seatown Road (west) arm is due to take place during nights or over a weekend and will require vehicles to divert via either Malahide Junction or Estuary Junction.

Estuary Court Main Works

The works on this section have no notable impact on general traffic, as all movements on the road network are maintained throughout this set of works.

There is a moderate impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that the worst-case scenario is in the evening peak on the R132 southbound to the north of Seatown Junction and shows an increase of 2% in HGV volume caused by the cumulative construction works in this section. The eastern arm of the Seatown roundabout junction has the highest increase in HGV movements of 6% eastbound. During the morning peak, results show the R132 southbound has the highest increase of HGV movements of 8% and 2% northbound.

There are no diversions or road closures proposed that will impact local access in the vicinity of the construction area.

Seatown Junction and Station Main Works

The closure of Seatown Road (east) will result in severe redistribution of traffic in the local area, under the STMP ratings. Primarily the traffic routes away from Seatown Junction to the east and west of junction, re-joining the R132 at Estuary and Malahide junctions. This results in high flow impacts at Estuary Junction and Medium impacts at Malahide Junction according to the STMP ratings.

The TTM in place at Seatown junction results in a Moderate impact in the local area in general according to STMP ratings, however there are some severe levels of traffic flow redistribution. The R132 northbound, between Seatown junction and Estuary junction will have a 60% (296 PCUs) increase in traffic flows in the morning peak, and 30% (254 PCUs) in the evening peak. However, this traffic increase does not lead to an increase in delay. Across the morning and evening peaks, increases in delay time are negligible.

The junction reconfiguration results in primarily a Slight impact on junction approach arms, however this is upgraded to Severe in the STMP assessment when considering the accumulated delay on diverted routes and the detailed operation outputs from junction modelling. Local Junction modelling results indicate that during this closure, Estuary Junction will operate over capacity and there will be significant delay on several arms of the junction. There is a slight impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that during the morning peak, the HGV volumes are lower or remain the same in the vicinity of the station. A slight increase in HGV volume occurs along R132 northbound of 8% during the morning peak. During the evening peak, the situation remains the same as the morning peak and the highest increase here is 6% westbound along Spittal Hill.

The restricted movements to and from the Seatown Road East arm on Seatown Junction will result in an approximate 1-2km diversion via the U-turn facilities on the R132 to the south of Malahide Junction and north of Estuary Junction.

As part of the R132 Connectivity Project two new junctions will be built on the R132 to facilitate safter pedestrian and cycle crossings, but also to allow for northbound and southbound traffic to perform U-turns. The U-turn facilities are provided at:

- The R132 between Estuary and Lissenhall Junction to facilitate movements from the R132 northbound to southbound; and
- R132 between Malahide and Seatown Junction to facilitate movements from the R132 southbound to northbound.

The two U-turn facilities will allow traffic impacted by the Seatown Junction closures to stay on the R132 for the entirety of the diversion, minimising the need to use local roads in the Swords area. Furthermore, additional mitigation in the form of diversion signage will encourage road users to utilise the R132 rather than seek alternative routeing.

NDC Compound Main Works

The Main Works TTM at this section did not progress to the Stage 2 STMP Impact Assessment and are envisaged to have no impact on public transport services.

Malahide Junction to Pinnock Hill Junction Enabling Works

The modelling indicates the Enabling Works will have a moderate impact on the general traffic movements in the local area. The redistribution of traffic in this section is caused by the significant delay on the R132 southbound approach arm on Estuary Junction is one of the primary causes of the reduction in traffic volume at Malahide Junction.

During the morning peak period the majority of traffic which has been redistributed is located to the west in the Swords town centre area, with some additional traffic routeing to the local roads in the east. During the evening peak there is a 26% increase in traffic approaching the junction from the R106 west arm. There is a considerable reduction in volume on the R132 at Malahide Junction, specifically on the southbound approach to the junction on the R132 where there is approximately a 34% reduction in volume in the morning peak and 25% reduction in the evening peak.

The lane reduction on the R132 southbound and northbound shows minimal driver delay in both the morning and evening peak period, however this is primarily due to the significant amount of traffic which has routed away from the R132 due to the simultaneous works at Estuary and Seatown Junctions, and along the R132. The largest delay recorded on approach to the junction is on the R132 northbound where a 55 second delay is recorded in the evening peak.

The impact of site traffic and HGV flows are not considered as part of the Enabling Works assessment.

There are no diversions or road closures proposed as part of the TTM that will impact local access in the vicinity of the works area.

Malahide Junction Main Works

The reduced capacity on the Malahide junction east arm results in some traffic redistribution in the local area. During the morning peak there is an increase in traffic flow on the north and west arms of the junction, while the east arm shows minimal change and the south arm has a slight decrease in flow. During the evening peak there is a general decrease in traffic volume on the east and west arms of the junction (R106) while the north and south arms (R132) have moderate increases in volume.

The redistributed traffic is primarily visible on local roads to the west of the R132, around Swords town centre, where particularly during the morning peak there are increases in traffic flows between 10%-30%. During the evening peak the traffic redistribution is slight and is spread throughout the local area.

The TTM at Malahide junction slights in slight delays on the east approach arm where the reduced capacity is in place. There are no other notable increases in delay in the local area caused by the works at Malahide junction.

There is a slight impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that the worst-case scenario is in the morning peak on the R132 southbound, south of Malahide Road roundabout, the increase here is 3%. During the evening peak, there is an increase of 2% HGV volume along the same R132 in the same direction. In the area immediately around the site, during both the morning and evening peaks, HGV volumes remain the same or decrease.

The Main Works TTM at Malahide Junction will have no impact on local accesses and will require no diversions for local movements.

Swords Central Station Main Works

The Main Works TTM at this section did not progress to the Stage 2 STMP Impact Assessment and are envisaged to have no impact on public transport services.

Pavillions Main Works

The Main Works TTM at this section did not progress to the Stage 2 STMP Impact Assessment and are envisaged to have no impact on public transport services.

Pinnock Hill Junction to North Portal Enabling Works

The modelling indicates that the Enabling Works will have a slight impact on the general traffic movements in the local area, with the traffic volume changes at the junction generally below 10%. Where the volume change is above 10%, this is considered an impact of the subsequent Enabling Works at the junctions to the north along the R132. The redistribution of traffic along the R132 is primarily caused by the significant delay on the R132 southbound approach arm on Estuary Junction.

During the AM peak there is a higher volume of traffic utilising the R125 to and from the M1 Junction 3 routeing towards Boroimhe (and further west) and Swords town centre, via Nevinstown Junction and Pinnock Hill Junction respectively. This is likely caused by the impacts highlighted in the Estuary and Seatown sections where traffic is leaving the M1 at Junction 3 rather than Junction 4.

The modelling indicates slight increases in delay due to the Enabling Works at Nevinstown Junction. There is a delay of 85 seconds on the Nevinstown Lane approach arm during the morning peak period, and this represents the highest delay increase in the area.

The impact of site traffic and HGV flows are not considered as part of the Enabling Works assessment.

The Enabling Works at Nevinstown Junction will result in the local diversions during various phases. The road closures during phases 1.2 and 1.3 and restricted movements during phases 3.3 and 3.4 are all over the weekend or at nights, and thus are awarded a slight impact rating in the STMP assessment. During these closures, vehicles will be required to route via Pinnock Hill Junction.

Pinnock Hill Junction Main Works

The full closure of the south-east arm of Pinnock Hill junction will result in severe impacts for general traffic in the local area. The traffic redistributes primarily towards the south of Pinnock Hill junction; this impact is most severe during the morning peak where there is an 81% (489 CU) increase in traffic volume on the R132 southbound between Pinnockhill Junction and Nevinstown Junction. During the evening peak period the increase in traffic volume on the R132 is where there is an approximate volume increase of 63% (388 PCU) southbound, and 63% (329 PCU) northbound. There are also severe increases of traffic volume on the L2300 and L2305 on approach and on exit of Nevinstown junction.

During both peak periods the driver delay is showing as a moderate to severe impact on the L2305 on approach to Nevinstown junction. Most of the delays per vehicle (average) noted are less than five minutes per link with the exception of the L2305 east approach arm to Nevinstown junction during the evening peak hour which displays expected delays of just over five minutes. There are moderate increases in delay on the R125 eastbound on approach to the M1 Junction 3 during the evening peak.

There is a moderate impact on the network from an increase in HGV movements in the local area according to STMP ratings. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that during the morning peak, the R132 will experience a 2-5% increase in HGV volumes while in the evening peak there is minimal change on the R132. HGV volumes remain approximately the same on the surrounding road networks around the station.

The closure of the southern arm at Pinnock Hill Junction will result in a severe impact for general traffic users and the proposed diversion is illustrated in Diagram 9.40.

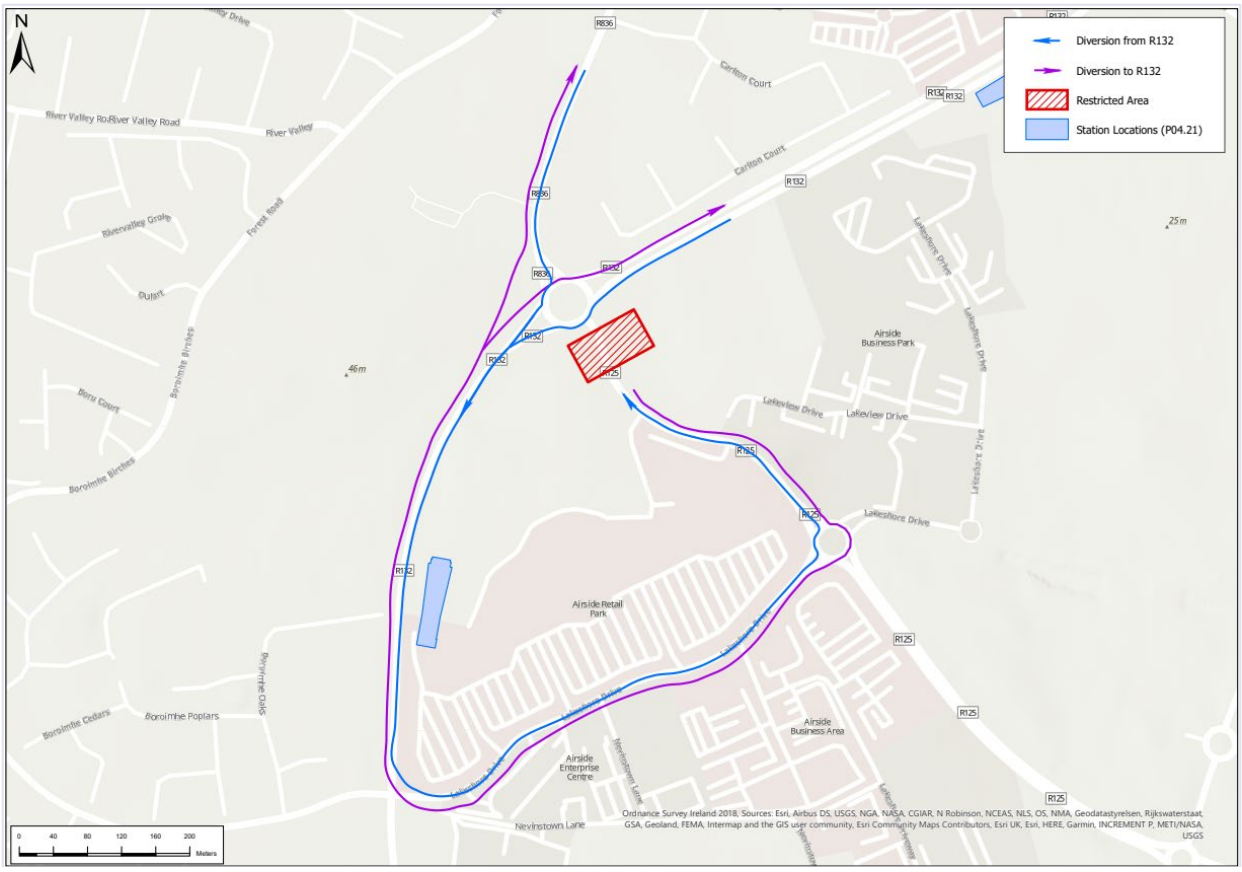

Diagram 9.39: R125 Pinnock Hill Diversions

The proposed diversion will route traffic via the Nevinstown signalised junction and Airside roundabout. At its longest distance the diversion will be approximately 1.5km. For vehicles routing from the north or north-east of this area, there is also the option to use Mountgorry Way as an alternative diversion.

Nevinstown Junction Main Works

The closure of the L2305 results in significant redistribution of traffic on the local network. The L2305 east bound loses the majority of the existing traffic volume due to vehicles being unable to access it. Conversely the volume on the L2305 westbound increases by approximately 100% during both peak periods primarily due to vehicles having diverted away from the Nevinstown Junction and approaching the L2305 from the west.

Analysis indicates that the largest impacts are recorded during the morning peak period, where the volume on the L2300 eastbound on approach to the R132/L2300 junction increases between 73% and 81% and a maximum increase in flow of 344 PCUs. There is also a significant increase in volume routeing from Nevinstown Junction southbound on the R132. The increase here during the morning peak is 75% (373 PCUs) and 55% (361 PCUs) in the evening peak.

The reconfiguration of Nevinstown Junction results in a slight impact at the junction itself, however the volume of traffic being routed through Pinnock Hill Roundabout results in significant increases in delay throughout the junction during the morning peak period, specifically on movements from the R132 northbound approach to the R125 exit. A consequence of the reconfiguration of Nevinstown Junction is that the western approach arm has significant reductions in delay. The evening peak period analysis indicates there will only be slight delays during this period.

There is a moderate impact on the network with respect to HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that during the morning peak, the R132 southbound will experience a 3-5% increase in HGV volume. During the evening peak, the R132 will experience no change to HGV volumes.

The closure of the eastern arm at Nevinstown Junction will result in a severe impact for general traffic users and the proposed diversion is illustrated in Diagram 9.41. The proposed diversion will route traffic via Pinnock Hill Junction and Airside roundabout. At its longest distance the diversion will be approximately 1.5km.

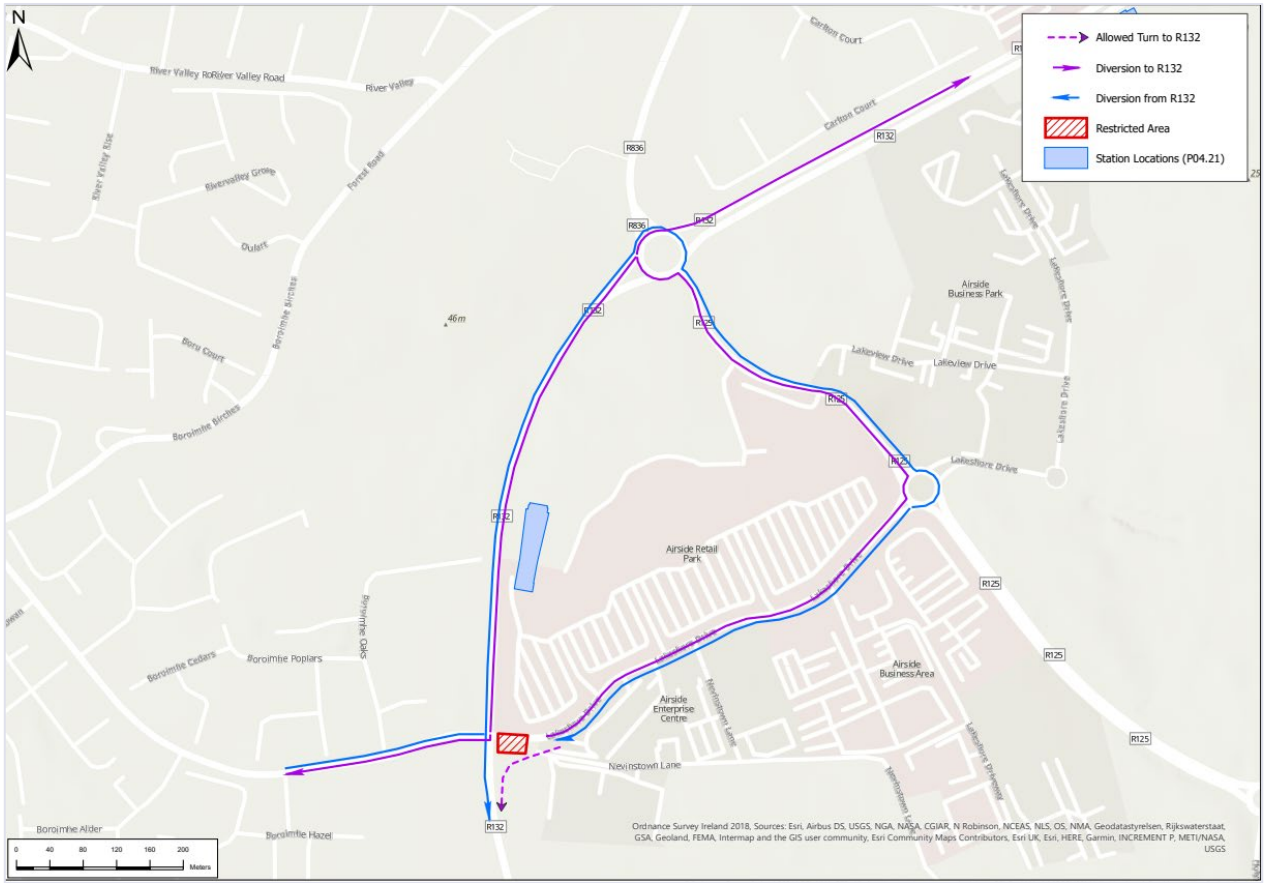

Diagram 9.40: Nevinstown Lane Diversion

R132 South Crossing Main Works

Model outputs indicate that the realignment of the R132 during the two phases of works will have a slight impact on traffic redistribution or driver delay. The analysis for the R132 crossing was undertaken within the same model as the Pinnock Hill Junction closures. The results indicate that the road layout changes at the R132 Crossing section do not generally impact the routeing profile of vehicles using this route. Further to this the increase in driver delay on the southern approach arm to Nevinstown Junction, where the capacity is affected by the R132 works, is negligible.

There is a moderate impact on the network from an increase in HGV movements in the local area. This impact applies to all sites within this section and represents a worst-case scenario for the section. Model results indicate that the worst-case scenario is during both peaks on the R132 to the south of Nevinstown Junction and shows an increase of 3-6% in HGV volume, during the morning peak and 1% in the evening peak. This is caused by the cumulative construction works in this section, representing a 5% share of all traffic.

Boland Compound Main Works

Main Works at the Boland Compound did not progress to the full Stage 2 Impact Assessment and are envisaged to have no impact on public transport services.

9.6.1.2.1.3 Pedestrian Construction Impact Assessment

Overall, there will be a short-term, Slight, Negative Impact on pedestrians during both the Enabling Works and Main Works, as temporary pedestrian facilities will be in place.

The STMP (Appendix A9.5) details the impacts to pedestrians during this scenario, with a summary of the significance of the impacts presented in Table 9.73.

Table 9.73: Summary of Construction Impact on Pedestrians

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
Estuary Station	Temporary work area over the footway on the southern and eastern arm of the junction- pedestrians will be required to use alternative crossing points during temporary closures	Low-Pedestrian Movements Maintained	Low-Minimal pedestrians in area	Short-term Not Significant Negative
R132 Swords Bypass	Temporary work area on the cycle lane and footway during some phases	Low-Pedestrian Movements Maintained, short section	Low-Minimal pedestrians in area	Short-term Slight Negative
Malahide Road Junction	Temporary work area on the footway during Phase 1 and 2	Low-Pedestrian Movements Maintained	Low-Minimal pedestrians in area	Short-term Slight Negative
R132 Swords Bypass- Pinnock Hill Junction	Temporary work area on the footway and cycle lane	Low-Pedestrian Movements Maintained	Medium-Proximity to Airside Retail Park	Short-term Slight Negative
Main Works				
Estuary Station	New footways partially closed along the R132 during phase 2. Infrastructure provided	Low- Temporary closure	Low- Minimal pedestrians in area	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
	in phase 3.			
Estuary Junction	The quality of the pedestrian infrastructure will be maintained throughout construction. Additional crossing points will be added along the route.	Low- infrastructure maintained	Low- Minimal pedestrians in area	Short-term Slight Negative
R132 North Crossing	Introduction of new 1.8m footways in both directions. Existing provision for pedestrians is an informal desire line	Low- pedestrian movements maintained or improved	Low- Minimal pedestrians in area	Short-term Slight Negative
Estuary Court	Site access intersects footway on Seatown Road, includes the removal of the southern footway on Seatown Road. Footways retained along the R132.	Low- Pedestrians advised to use footway on opposite side of road, increased crossing points provided	Low- Minimal pedestrians in area	Short-term Slight Negative
Seatown Junction	Introduction of combined cycleway and footway on the east section of the junction.	Low-Pedestrian Movements Maintained	Low-Minimal pedestrians in area	Short-term Slight Negative
Malahide Junction	Introduction of combined cycleway and footway on the east section of the junction.	Low-Pedestrian Movements Maintained	Low-Minimal pedestrians in area	Short-term Slight Negative
Pinnock Hill Junction	Retention of footways and pedestrian phases on 3 operational arms and dedicated pedestrian link to R125 from junction	Low-Pedestrian Movements Maintained	Medium- Proximity to Airside Retail Park	Short-term Slight Negative
Nevinstown Junction	Realigned footway on the east section of the junction	Low-Pedestrian Movements Maintained	Medium- Proximity to Airside Retail Park	Short-term Slight Negative
R132 Crossing South	Retention of footways on both sides of the road. Both 1.5m, there will be conflict points with the Boland site access and other accesses	Low-Pedestrian Movements Maintained	Medium- Proximity to Airside Retail Park	Short-term Slight Negative

Estuary to Seatown Station Section

The Enabling Works in this section will have a slight impact on pedestrians. The majority of phases during the works will have no impact on infrastructure, however during phases 1.3 and 1.4 there will be a

short section of footway which will be temporarily closed for pedestrians. These users will be safely diverted around the worksite, therefore retaining the movements during all phases and resulting in a slight impact for users.

During the Main Works at Estuary Station, new footways are partially closed along the R132 during phase 2, however full pedestrian infrastructure is provided in phase 3.

During both phases of TTM at Estuary Junction, the quality of pedestrian infrastructure will be maintained. During Phase 2 there will be additional pedestrian crossings on both of the temporary on- and off-slips. This will cause a slight diversion for pedestrians and the impact on safety is minimal with safe crossing points available for all movements. There will be conflict points with site traffic at site entrances for users during both phases of works, but appropriate warning signs and visibility splays will be provided. The footbridge here provides general access across the R132 Sword Bypass and also functions to link the Balheary Park playing pitches, to the Fingallian's GAA club. The use of the bridge becomes redundant by the proposed upgrade of the R132 Swords Bypass through this area with signalised crossings to be maintained as the removal of the bridge and other proposed project works are progressed. An alternative safe pedestrian crossing will be provided prior to demolition of the bridge. The enabling works for the footbridge removal and associated traffic managements will require one overnight road closure on the R132 Swords Bypass, and therefore the impact to pedestrians is Negligible.

At the R132 Crossing North site, the proposed TTM of new 1.8m footways in both directions will provide improved facilities for pedestrians and vulnerable users.

Seatown Station to Malahide Junction

The Enabling Works in this section will have a slight impact on cyclists, pedestrians and vulnerable users. The majority of phases during the works will have no impact on infrastructure, however during phases 1.1, 1.3 and all sub-phases in Phase 2 there will be a short section of cycle lane and footway which will be temporarily closed for cyclists, pedestrians and vulnerable users. These users will be diverted around the worksite.

The majority of footways are retained throughout the Main Works at Estuary Court, with the exception being the footway on the south side of Seatown Road (minor), where pedestrians will be advised to use the footway on the opposite side of the road. There are also increased crossing points for pedestrians and vulnerable users due to the site accesses.

All movements for pedestrians and vulnerable users will be retained at Seatown Junction with only minor diversions for re-aligned sections. Pedestrians and vulnerable users may pass in close proximity to the working area, but generally safe levels of pedestrian infrastructure are maintained. Existing dedicated footways and crossing points are maintained where possible. A small increase in journey length is necessary due to diversions on the east arm.

Malahide Junction to Pinnock Hill Junction

The Enabling Works in this section will have a slight impact on both cyclists, pedestrians and vulnerable users. The majority of phases during the works will have no impact on infrastructure, however during phases 1.1, 1.3 and all sub-phases in Phase 2 there will be a short section of cycle lane and footway which will be temporarily closed for cyclists, pedestrians and vulnerable users. These users will be diverted around the worksite.

All movements for pedestrians and vulnerable users retained with only minor divisions for re-aligned sections. There will be small impacts on safety and quality of infrastructure during both phases, where a section of the footway is closed, requiring pedestrians and vulnerable users to cross onto the other side of the road. During Phase 1 a dedicated footway is retained on the south of the re-aligned road with a width of two meters while during Phase 2 there is a shared space with cyclists to the north of the re-aligned road.

Main Works at Swords Central Station and Pavillions Satellite Compound did not progress to Stage 2 of the assessment and are envisaged to have negative impacts on pedestrians.

During construction, the public footpath access from the R132 Swords Bypass alongside the Fujitsu Ireland units and onto Lakeshore Drive to the rear, will be closed off. Pedestrian access into Fujitsu is situated to the rear of the units and will not be impacted. The use of this public footpath is minimal, and its closure will have a negligible impact on pedestrians.

Pinnock Hill Junction to North Portal

The Enabling Works at Pinnock Hill Junction will have a slight impact on both cyclists, pedestrians and vulnerable users. The majority of phases during the works will have no impact on infrastructure, however during Phase 1 and Phases 3.2 and 3.5 there will be a short section of cycle lane and footway which will be temporarily closed for cyclists, pedestrians and vulnerable users. These users will be diverted around the worksite.

During Phase 1 of the Main Works TTM at Pinnock Hill Junction, the majority of the active travel infrastructure will be unchanged, with the exception of the footway on the southern corner of the junction which will be removed to allow for the construction of the new local access road. This closure will require users to cross at the junction and use the footway opposite side of the R125.

During Phase 2 the R125 southern arm of Pinnock Hill Junction will be closed to traffic but there will be a dedicated off-road active travel link built to the east of the junction, routing from the R132 southbound carriageway through the existing Travelodge car park eventually joining the R125. This new link will route between two construction sites and will provide a safe link for pedestrians, cyclists and vulnerable users. The new link will only represent a slight increase in journey time for these users.

All movements for pedestrians and vulnerable users will be retained at Nevinstown Lane with only minor diversions needed for re-aligned sections, specifically the eastern extent junction which requires users to cross the new realigned one-way traffic lane from the L2305. This will incur a small increase in journey length due to diverted infrastructure.

At the R132 Crossing south, there will be retention of footways on both sides of the road, generally 1.5m width on each site. There will be conflict points with the Boland site access and other accesses along this section, but this will be similar to the existing level of pedestrian infrastructure.

9.6.1.2.1.4 Cycle Construction Impact Assessment

Overall, there will be a short-term, Slight, Negative Impact on cyclists during the Enabling Works. The STMP (Appendix A9.5) details the impacts to cyclists during this scenario, with a summary of the significance of the impacts presented in Table 9.74.

There will be a short-term, Moderate, Negative impact on cyclists during the Main Works as a result of the removal of the proposed cycle lane on the R132 Swords Bypass, all other locations will have either Slight or Imperceptible negative impacts.

Table 9.74: Summary of Construction Impact on Cycle Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R132 Swords Bypass	Temporary work area on the cycle lane and footway during some phases	Low- Cycle movements maintained, short section	Low-Minimal cyclists in area	Short-term Slight Negative
Malahide Road Junction	Temporary work area on the footway and cycle lane	Low- Cycle movements maintained	Low-Minimal cyclists in area	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Pinnock Hill Junction	Temporary work area on the footway and cycle lane	Low- Cycle movements maintained	Medium- proximity to Airside Retail Park	Short-term Slight Negative
Main Works				
Estuary Station	Phase 3 includes cycle lanes on both side of the carriageway and cycle crossing infrastructure built into the signalized junction	Low- Cycle movements maintained	Low-Minimal cyclists in area	Short-term Slight Negative
Estuary Junction	Quality of the cycling infrastructure will be maintained throughout construction. Additional crossing points will be added along the route.	Low- movements maintained	Low-Minimal cyclists in area	Short-term Slight Negative
R132 Crossing North	No existing or proposed designated cycle infrastructure on this section of the R132	Negligible- no infrastructure to be impacted	Low- Minimal cyclists in area	Short-term Imperceptible Negative
R132 Swords Bypass- Estuary Court	Removal of proposed cycle lane on R132	Medium- loss of cycle facilities	Low-Minimal cyclists in area	Short-term Moderate Negative
Seatown Junction	Introduction of combined cycleway and footway on the east section of the junction.	Low- Cycle movements maintained	Low-Minimal cyclists in area	Short-term Slight Negative
Malahide Junction	Introduction of combined cycleway and footway on the east section of the junction.	Low- Cycle movements maintained	Low-Minimal cyclists in area	Short-term Slight Negative
Pinnock Hill Junction	Retention of cycle lanes and cycle phases on the three operational arms. Dedicated two-way off-road cycle link to R125 from junction	Low- Cycle movements maintained	Medium- Proximity to Airside Retail Park	Short-term Slight Negative
Nevinstown Junction	Introduction of cycle lanes on the new left-only link. All movements for cyclists retained with only minor diversions for realigned sections	Low- Cycle movements maintained	Medium- Proximity to Airside Retail Park	Short-term Slight Negative
R132 Crossing South	Partial cycle lane on northbound section of the carriageway	Low- Cycle movements maintained	Medium- Proximity to Airside Retail Park	Short-term Slight Negative

Estuary to Seatown Station Section

The Enabling Works in this section will have a slight impact on cyclists. The majority of phases during the works will have no impact on infrastructure, however during phases 1.3 and 1.4 there will be a short section of cycle lane which will be temporarily closed for cyclists. These users will be safely diverted around the worksite, therefore retaining the movements during all phases and resulting in a slight impact for users.

There are no impacts caused by the Main Works at Estuary Station. Existing infrastructure for cyclists is limited in this area, with Phase 3 of the works including cycle lanes on both sides of the carriageway.

During both phases of TTM during the Main Works at Estuary Junction, the quality of cycle and pedestrian infrastructure will be maintained. During Phase 2 there will be additional pedestrian crossings on both of the temporary on- and off-slips. This will cause a slight diversion for cyclists and pedestrians and the impact on safety is minimal with safe crossing points available for all movements.

There will be conflict points with site traffic at site entrances for users during both phases of works, but appropriate warning signs and visibility splays will be provided.

There is currently no designated cycle infrastructure on the R132 Crossing North section of the R132. The R132 capacity for general traffic is partially reduced to two lanes in each direction and this reduced capacity along R132 results in cyclists using general traffic lanes which are carrying higher volumes of traffic per lane, including buses and site traffic. The R132 is not a primary or secondary designated cycleway and the works do not affect any nearby primary or secondary cycleways. It is possible that the inside traffic lane could be converted to a bus/cycle lane, subject to agreement with FCC.

Seatown Station to Malahide Junction Section

The Enabling Works in this section will have a slight impact on both cyclists, pedestrians and vulnerable users. The majority of phases during the works will have no impact on infrastructure, however during phases 1.1, 1.3 and 1.4 there will be a short section of cycle lane and footway which will be temporarily closed for cyclists, pedestrians and vulnerable users. These users will be diverted around the worksite.

There is no existing dedicated cycle infrastructure on this section of the transport network, however the R132 Connectivity Project includes a cycle lane on the R132 southbound, which will be temporarily removed to provide a dedicated turning lane for Seatown Road (minor). Cyclists on the R132 will be required to use the bus lane during this lane removal. Cyclists using Seatown Road will face increased safety impacts caused by increased traffic volume utilising the two new priority site entrances.

All movements for cyclists retained with only minor diversions for re-aligned sections on the Seatown Road east. Cyclists may pass in close proximity to the working area, but generally safe levels of cycling infrastructure are maintained. Existing cycle lanes and crossing points are maintained where possible. A small increase in journey length is necessary due to diversions on the east arm.

Malahide Junction to Pinnock Hill Junction

The Enabling Works in this section will have a slight impact on both cyclists, pedestrians and vulnerable users. The majority of phases during the works will have no impact on infrastructure, however during phases 1.1, 1.3 and all sub-phases in Phase 2 there will be a short section of cycle lane and footway which will be temporarily closed for cyclists, pedestrians and vulnerable users. These users will be diverted around the worksite.

All movements for cyclists retained with only minor impacts recorded against each criterion. In the proximity of the re-aligned sections there will be a small impact on safety and quality of infrastructure, specifically during Phase 2 where there is the introduction of a shared space section on the northern footway. During both phases there is a proposed toucan crossing where cyclists will be able to safely access cycle lanes on each side of the road. During Phase 1 a dedicated cycle lane is retained on the

east arm of the junction albeit with both directions bound between the re-aligned westbound traffic lane and southern footway.

The Main Works at Swords Central Station and Pavillions Satellite Compound did not progress to Stage 2 of the assessment and are not envisaged to have negative impacts on parking and loading.

Pinnock Hill Junction to North Portal

The Enabling Works at Pinnock Hill Junction will have a slight impact on both cyclists, pedestrians and vulnerable users. The majority of phases during the works will have no impact on infrastructure, however during Phase 1 and Phases 3.2 and 3.5 there will be a short section of cycle lane and footway which will be temporarily closed for cyclists, pedestrians and vulnerable users. These users will be diverted around the worksite.

During Phase 1 of the TTM the majority of the active travel infrastructure will be unchanged, with the exception of the footway on the southern corner of the junction which will be removed to allow for the construction of the new local access road. This closure will require users to cross at the junction and use the footway opposite side of the R125.

During Phase 2 the R125 southern arm will be closed to traffic but there will be a dedicated off-road active travel link built to the east of the junction, routing from the R132 southbound carriageway through the existing Travelodge car park eventually joining the R125. This new link will route between two construction sites and will provide a safe link for pedestrians, cyclists and vulnerable users. The new link will only represent a slight increase in journey time for these users.

At Nevinstown Junction, there are safe levels of cycling infrastructure in place and existing lanes and crossing will be retained where possible. Slight increase in journey time due to eastern arm diversion.

Existing cycling infrastructure in the area of the R132 Crossing South is limited and the proposed design only imposes a slight impact. Partial cycle lane on northbound section of the carriageway only, with no cycle infrastructure on the southbound carriageway. Southbound cyclists would be required to use the bus lane throughout this section. There will be a conflict point with the Boland site access for northbound cyclists.

9.6.1.2.1.5 Parking and Loading Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to parking and loading during this scenario, with a summary of the significance of the impacts presented in Table 9.75.

Table 9.75: Summary of Construction Impact on Parking and Loading

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works Only				
Seatown Junction	No proposed TTM	Imperceptible- no proposed TTM	Low-Minimal parking and loading facilities in area	Short-term Negligible Negative
Estuary Court	No proposed TTM	Imperceptible- no proposed TTM	Low-Minimal parking and loading facilities in area	Short-term Negligible Negative
Malahide Junction	No proposed TTM	Imperceptible- no proposed TTM	Low-Minimal parking and loading facilities in area	Short-term Negligible Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Nevinstown Junction	Works at Nevinstown Junction causing delays and diversions	Low- weekend and night-time works	Low-Minimal parking and loading facilities in area	Short-term Negligible Negative
Enabling Works and Main Works				
Ennis Lane	Closure of Ennis Lane, joining R132 to Balheary Road- impact on commercial loading	Low- 2.6km diversion	Low- Local Road	Short-term Slight Negative
Estuary Junction	Loss of turning movements to and from the R125 (west) junction arm	Medium- 1-2km diversion	Medium- Regional Road Network	Short-term Moderate Negative
R132 Crossing North	No proposed TTM	Imperceptible	Low	Short-term Negligible Negative
Seatown Junction	30% of parking spaces lost at Woodies due to construction boundary	High- 30% commercial loss	High-Commercial retail use impacted	Short-term Significant Negative
Malahide Junction	No proposed TTM	Imperceptible- no proposed TTM	Low-Minimal parking and loading facilities in area	Short-term Negligible Negative
Pinnock Hill Junction - Loading	Diversion of approx. 1.5km due to R125 south of closure	Medium- 1.5km diversion	Medium- Proximity to Airside Retail Park	Short-term Moderate Negative
Travelodge Pinnock Hill Junction	Loss of 20% of accommodation parking	Medium- 20% of spaces lost	Medium-Hotel parking	Short-term Moderate Negative
Nevinstown Junction	Delays and diversions for commercial loading access due to L2305 closure	Medium- 1.5km diversion	Medium-Proximity to Airside Retail Park	Short-term Moderate Negative
Airside Retail Park	Loss of 10%-30% spaces	Medium – 10%-30% spaces lost	Medium-Proximity to Airside Retail Park	Short-term Moderate Negative

Estuary to Seatown Station Section

During the Enabling Works in this section, there will be no impact on parking and loading.

During the Main Works at Estuary Station site, the closure of the Ennis Lane/R132 priority junction results in the need of a diversion. This impact is classified as a slight impact in relation to commercial vehicles as Ennis Lane is not considered a primary route that would be often utilised.

During the Main Works at Estuary Junction site, commercial and retail delivery vehicles will be subject to the same 1-2km diversion and restrictions as general traffic.

There will be no impact on parking and loading during the Main Works at the R132 Crossing North.

Seatown Station to Malahide Junction Section

There will be a short-term Negligible impact on parking and loading at Seatown station during the Enabling Works as no TTM is proposed for this user.

There will be a short-term Negligible impact on parking and loading at Estuary Court during the Main Works as no TTM is proposed for this user.

During the Main Works at Seatown Junction and Station, commercial vehicles will be subject to the same diversions as general traffic. There will be a short-term, Significant Negative impact on access for commercial loading as a result of the restriction of movements on Seatown Junction, and a loss of approximately 30% of existing parking spaces at Woodie's store. This is a residual impact of the proposed TTM measures however it will be removed once the Construction Phase is complete.

The Main Works at NDC Compound did not progress to Stage 2 of the assessment and are not envisaged to have negative impacts on parking and loading.

Malahide Junction to Pinnock Hill Junction Section

There will be a short-term Negligible impact on parking and loading at Malahide Junction during the Enabling Works and Main Works as no TTM is proposed for this user.

The Main Works at Swords Central Station and Pavillions Satellite Compound did not progress to Stage 2 of the assessment and are not envisaged to have negative impacts on parking and loading.

Pinnock Hill Junction to North Portal Section

During the Enabling Works, the road closures at Pinnock Hill Junction during phases 1.2 and 1.3 and restricted movements during phases 3.3 and 3.4 (detailed in the STMP, Appendix A9.5) are all over the weekend or at nights, and thus are awarded a slight impact rating. During these closures, vehicles will be required to route via Pinnock Hill Junction. The diversions will mostly be in place in order to access commercial units. They will fall into the moderate category in the STMP assessment, however due to their short duration, they will be reduced to a slight impact.

During the Main Works at Pinnock Hill Junction, the construction site extent and new active travel link during Phase 2 will result in the parking space loss of approximately 20% in the Travelodge car park, representing a moderate impact. The level of loss will be slightly less during Phase 1 and will represent an approximate 10% loss of spaces.

During the Main Works at Nevinstown Junction, the closure of the eastern arm at Nevinstown Junction will result in a moderate impact for commercial traffic. The proposed diversion will route traffic via Pinnock Hill Junction and Airside roundabout. At its longest distance the diversion will be approximately 1.5km.

There will be a short-term, Moderate negative impact on parking at Airside Retail Park during both the Enabling Works and Main Works, as a result of the loss of 10% - 30% of retail parking.

There will be no impact to parking and loading as a result of the Main Works at the R132 South Crossing.

The Main Works at the Boland Compound did not progress to Stage 2 of the assessment and are not envisaged to have negative impacts on parking and loading.

9.6.1.2.2 AZ2 Airport Section

This section of the chapter presents a description of the impacts on the AZ2 Airport Section (Dublin Airport North Portal (DANP) to Dublin Airport South Portal (DASP)) during the Construction Phase. A full description of the AZ2 Northern Section can be found in Chapter 4 (Description of the MetroLink Project). The station within this section is Dublin Airport Station.

Further details on the Construction Phase can be found in the STMP (Appendix A9.5) and Chapter 5 (MetroLink Construction Phase).

The proposed DANP is located on Naul Road, to the north of the Dublin Airport perimeter.

The DANP STMP details the proposed traffic management approaches, including realignments and access/egress arrangements for construction site. The initial utility layouts associated with the Enabling Works do not include any TTM design and therefore the below assessment is in relation to the Main Works only. All Enabling Works will take place within the site boundary of the Main Works and will thus be subject to the same impacts. The DANP site is a TBM reception site which will be used to extract the TBM after the completion of the Dublin Airport tunnel. The TBM will be dismantled from this portal and will be removed from the site. Chapter 5 (MetroLink Construction Phase) details how abnormal loads will be dealt with throughout the Construction Phase. Furthermore, an Abnormal Load Route Survey Report (Appendix A5.6) was prepared that informed the designated haul routes for the delivery of abnormal loads including the identification of all pinch points on the selected routes and swept path analysis and vertical assessments.

Detailed information on the sequencing and methodology required to construct the specific section of the works is detailed in Chapter 5 (Metrolink Construction Phase).

The Dublin Airport STMP details the proposed traffic management approaches, including realignments and access/egress arrangements for the construction site. The initial utility layouts associated with the Enabling Works do not include any TTM design and therefore the below assessment is in relation to the Main Works only. All Enabling Works will take place within the site boundary of the Main Works and will thus be subject to the same impacts.

The construction phase for Dublin Airport Station will take place on one single site, occupying the existing Terminal 2 Surface Car Park. The construction site footprint will remain static throughout the Construction Phase. The construction of this station will take place over an eight year and three-month period. There will be three phases of TTM during the Construction Phase of this station.

The DASP construction site will be located to the south of Dublin Airport, between Old Airport Road and the M50 Motorway.

The DASP STMP details the proposed traffic management approaches, including realignments and access/egress arrangements for the construction site. The initial utility layouts associated with the Enabling Works do not include any TTM design and therefore the below assessment is in relation to the Main Works only. All Enabling Works will take place within the site boundary of the Main Works and will thus be subject to the same impacts.

The impact assessment undertaken assumes that the proposed infrastructure changes in the AZ2 Airport Section associated with BusConnects, will be in place.

9.6.1.2.2.1 Public Transport Construction Impact Assessment

Throughout the Construction Phase at this location there will be a short term, Imperceptible, negative impact on public transport during the construction of the DANP, Dublin Airport Station and DASP. The STMP (Appendix A9.5) details the impacts to public transport during this scenario, with a summary of the significance of the impacts presented in Table 9.76.

Table 9.76: Summary of Construction Impact on Public Transport

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
DANP	TTM during site establishment and for abnormal loads- did not progress to Stage 2 assessment	Negligible- minimal TTM necessary	Low- Limited PT network in surrounding area	Short-term, Imperceptible, Negative
Dublin Airport	TTM during site establishment and for abnormal loads	Negligible- construction site does not interact with PT network	High- Multiple high frequency bus services	Short-term, Slight, Negative
DASP	TTM during site establishment and for abnormal loads	Low- negligible impact on PT services- limited TTM necessary	Low- Limited PT network in surrounding area	Short-term, Imperceptible, Negative

At the DANP, TTM will need to be put in place during site establishment, and when loads require access to the site, however this is negligible and Main Works at the DANP site did not progress to the full Stage 2 Impact Assessment. During the main construction period there is expected to be limited impact on the existing transportation network.

The Dublin Airport Station site will result in a negligible impact on bus routing or journey times in the vicinity of the station site.

During the main Construction Phase associated with the DASP, there is expected to be limited impact on the existing transportation network. TTM will need to be put in place during site establishment, and when abnormal loads require access to the site.

9.6.1.2.2.2 General Traffic Construction Impact Assessment

For this section, calculations for construction vehicle numbers are for DANP, Dublin Airport Station and DASP construction sites. Table 9.77 presents a summary of the construction vehicles numbers associated with the entire construction sites in this section. The daily range of movements are noted, however much of the Construction Phase has daily movements below this range.

The STMP (Appendix A9.5) provides details of the proposed haulage route for the construction vehicles.

Table 9.77: Construction Vehicles Numbers for AZ2 Airport Section

Construction Vehicles	Total	Average Daily Range	Maximum Daily Movements	Duration of Maximum Weekly Movements
DANP	~ 12,500 movements	20- 40 movements per day, majority of construction period has daily vehicle movements below this range	108 movements for two days	520 movements for 1 week
Dublin Airport Station	~ 42,000 movements	20 -50 movements per day, however much of the construction period has daily movements below this range	98 movements per day for 1 day	476 movements for approximately 3 weeks
DASP	~ 99,000 movements	75-150 movements per day, majority of construction period has daily vehicle movements below this range	468 movements for 1 day	2,324 for two weeks

The STMP (Appendix A9.5) details the impacts to general traffic during this scenario, with a summary of the significance of the impacts presented in Table 9.78.

Table 9.78: General Traffic Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
DANP	TTM during site establishment and for abnormal loads- did not progress to Stage 2 assessment	Negligible-minimal TTM necessary	Medium- Naul Road is a Local Road however routeing via R132 (Regional Road Network)	Short-term, Not Significant, Negative
Dublin Airport	Removal of existing car park access, replaced with two priority access junctions to the north-east and south perimeter of the site. 8% increase in HGVs on R132 southbound	Low- No diversions necessary. No alterations to existing junctions or reductions in road capacity	High- Regional Road Network and Proximity to M1- existing high volumes of traffic	Short-term, Slight, Negative
DASP	Two new priority junctions on Old Airport Road for access to DASP Site.	Low- no reduction in road capacity	Medium-Local Road with High sensitivity to change however limited volumes of traffic in vicinity on Old Airport Road	Short-term, Slight, Negative

The Main Works at the DANP site did not progress to the full Stage 2 Impact Assessment.

The assessment at Dublin Airport Station does not take into consideration the planned DAA paid drop-off facility at the Terminal 2 surface car park, which has been granted planning permission with the condition that the infrastructure is permitted on a 'temporary basis only and shall cease within five years of the final grant of permission or otherwise where required for purposes of MetroLink', in line with the policy objectives to 'ensure the delivery of MetroLink.'

The proposed traffic management will have a short-term, Moderate, Negative impact on the general traffic movements in the area. There is no reduction in road capacity due to the works and no alterations to existing junctions. There are two site access points, but both will only result in slight impacts to general traffic users. The construction of the Dublin Airport Station site will result in no diversions for general traffic or impact on local access.

The impacts around Dublin Airport are minimal, however, the southern arm of the R132 southbound sees an increase in traffic 17 PCUs during the morning peak. And 15 PCUs in the evening peak. During the evening peak, the R132 northbound also has an increase in traffic flow of 37 PCUs (8%).

There is some expected increased delay at the Airport Roundabout due to the volume HGV movements during peak spoil removal periods, however this still falls within the slight impact rating in the STMP. The increase in delay is primarily on the southern approach arm of the Airport Roundabout and this is primarily caused by the cumulative impact of works taking place in the Pinnock Hill Junction to North Portal section, rather than the direct works at the Dublin Airport Station.

Model outputs indicate there will be an increase in HGV volume along the vehicular entrance to Terminal 2 at Dublin Airport. During the morning peak, this is a 1% increase in HGV volume and 2% in the evening peak. During the evening peak, the R132 southbound will experience a 1% increase in HGV volume. Elsewhere surrounding the station, HGV volumes remain unchanged in both the morning and evening

peak periods. At this point, the traffic from HGVs will equate to approximately 45% of traffic mode share during the morning peak, and 13% in the evening peak.

The proposed traffic management at DASP will have minimal impact on the general traffic movements in the area. There will be no reduction in road capacity and the two new priority junctions will not impact general road users. The proposed traffic management will have a short-term Negligible negative impact on the HGV movements in the area.

9.6.1.2.2.3 Pedestrian Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to pedestrians during this scenario, with a summary of the significance of the impacts presented in Table 9.79.

Table 9.79: Pedestrian Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
DANP	TTM during site establishment and for abnormal loads- did not progress to Stage 2 assessment	Negligible- minimal TTM necessary	Low- limited pedestrian infrastructure in vicinity	Short-term, Imperceptible, Negative
Dublin Airport	Removal of footway adjacent to site- movements maintained via a diversion through the covered walkway	Low- movements maintained via diversion	High- high volumes of pedestrians in vicinity	Short-term, Moderate, Negative
DASP	TTM during site establishment and for abnormal loads-	Negligible- minimal TTM necessary	Low- limited pedestrian infrastructure in vicinity	Short-term, Imperceptible, Negative

Main Works at the DANP site will have a negligible impact on the pedestrian environment.

At Dublin Airport Station site, the removal of the existing footway to the east of site will result in a short-term, Moderate, Negative impact on pedestrians and vulnerable users. The footway closures require users intending to travel between areas south and north of the site to route to the west of the site via the covered walkway at the bus station. This is a residual impact of the proposed TTM measures however it will be removed once the Construction Phase is complete.

At DASP, there will be a negligible impact on pedestrians and vulnerable users throughout the Construction Phase.

9.6.1.2.2.4 Cycle Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to vulnerable users during this scenario, with a summary of the significance of the impacts presented in Table 9.80.

Table 9.80: Summary of Construction Impact on Cycle Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
DANP	TTM during site establishment and for abnormal loads- did not progress to Stage	Negligible- minimal TTM necessary	Low- limited cycle infrastructure in the vicinity	Short-term, Imperceptible, Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
	2 assessment			
Dublin Airport	Removal of off-road westbound cycle lane, required to use general traffic lanes	Low- increased conflict with hazards	Low- nature of travel to airports, limited cycle demand	Short-term, Slight, Negative
DASP	TTM during site establishment and for abnormal loads	Negligible-minimal TTM necessary	Low- limited cycle infrastructure in the vicinity	Short-term, Imperceptible, Negative

Throughout the Construction Phase there will be a short term, Imperceptible, negative impact on cyclists at the DANP.

The Dublin Airport Station main works will have a short-term, Moderate, Negative impact on cyclists. The impact is the consequence of the construction site location and associated works results in the loss of the existing northbound cycle lane, resulting in cyclists having to utilise the general traffic lane. This results in an impact for cyclist safety and journey time where they will be interacting with general traffic and site traffic along this section of road. This is a residual impact of the proposed TTM measures however it will be removed once the Construction Phase is complete.

The construction phase associated with the DASP will have a negligible impact on cyclists as limited TTM is required.

9.6.1.2.2.5 Parking and Loading Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to Parking and Loading during this scenario, with a summary of the significance of the impacts presented in Table 9.81.

Table 9.81: Parking and Loading Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
DANP	TTM during site establishment and for abnormal loads- did not progress to Stage 2 assessment	Negligible-minimal TTM necessary	Low- limited parking facilities in area to be affected	Short-term, Imperceptible, Negative
Dublin Airport	Loss of 270 parking spaces with the removal of T2 surface car park	Low- 1% of total parking available in area	Medium- demand for airport parking can be accommodated elsewhere	Permanent, Slight, Negative
DASP	Removal of airport view parking, and suspension of parking through main works duration	Low- temporary loss in relation to proportion of parking available in area	Low- Informal parking lay-by	Short-term, Slight, Negative

The construction of the DANP there will be a short term, Imperceptible, negative impact on parking or loading facilities, as TTM is only required during site establishment and when abnormal loads require access to the site. As such, the Main Works at DANP did not progress to full Stage 2 Impact Assessment.

Overall, there will be a Permanent, Slight Negative impact as a result of the loss of spaces in the Terminal 2 Surface Car Park during the construction of the Dublin Airport Station. This closure is permanent as the

site will function as the Dublin Airport Station site. In total, there are 18,600 Long-term car parking spaces available at Dublin Airport, and 4,000 short-term spaces, giving a total of 22,600 available spaces (https://www.dublinairport.com/car-parks). The removal of 270 spaces is considered to be an impact of Low magnitude as it equates to approximately 1% of the total amount of available parking at Dublin Airport (total long-term and short-term parking combined). Therefore, as a proportion of the total available spaces, this is not considered a significant loss.

The construction of the DASP will have a short-term, Slight, Negative impact on parking and loading facilities. The location of the site entrance will require the removal of the Airport viewing parking area and suspension of parking throughout Main Works duration.

9.6.1.2.3 AZ3 Dardistown to Northwood Section

This section of the chapter presents a description of the construction impact on the public transport, road, pedestrian, cycle and parking network in the AZ3 Dardistown Section (DASP to Northwood). A full description of the sections of retained cut, and cut and over sections within the AZ3 Dardistown to Northwood Section can be found in Chapter 4 (Description of the MetroLink Project).

The construction sites within this section include:

- Dardistown Station and Depot;
- M50 Viaduct Site; and
- Northwood Station.

Further details on the construction impacts can be found in the STMP (Appendix A9.5) and Chapter 5 (MetroLink Construction Phase).

The Dardistown Station and Depot construction site will be located to the south of Dublin Airport, between Old Airport Road and M50 Motorway. The proposed depot location will result in the disruption of the existing field boundaries; therefore, a new access road will be provided to accommodate access to the wastewater treatment plant and any severed lands. All Enabling Works will take places within the site boundary of the Main Works and will thus be subject to the same impacts as the Main Works. The construction of this station will take place over a nine-year period, with two phases of TTM.

The M50 Viaduct is located to the east of Junction 4 and consists of a 3-span composite steel beam and in-situ concrete deck bridge over the existing M50 Motorway. There will be two primary construction sites to facilitate the construction of the M50 Viaduct, one to the north of the crossing point in an existing field to the northwest of the M50 Motorway Junction 4, and one to the south. There will also be work sites on the slip roads to the east of the junction and in the hard shoulder on both sides of the carriageway. All Enabling Works will take places within the site boundary of the Main Works and will thus be subject to the same impacts as the Main Works. The TTM will take place over approximately a six-month period. There will be four phases of TTM during the Construction Phase of this section. The construction period of this section is approximately 2.5 years.

Prior to the main works commencing at Northwood Station there will be a number of Enabling Works, including utilities diversions and site access construction, which will require TTM. The main works construction of this station is split into two primary phases and will require the realignment of Ballymun Road throughout the majority of the construction timeframe. The Enabling Works will take place over approximately a six to eight month period, split into five phases which will take place within the Main Works programme and site boundary, and therefore does not require additional TTM. The construction of the station will take seven years, with two primary phases of TTM. Phase 1 is expected to be in place for approximately one and a half years, while Phase 2 will be in place for approximately five years and nine months.

This site is a TBM reception site which will be used to extract the TBM after completion of the Dublin Airport tunnel. The TBM will be dismantled from this portal and will be removed from the site. Chapter 5 (MetroLink Construction Phase) details how abnormal loads will be dealt with throughout the Construction Phase. Furthermore, an Abnormal Load Route Survey Report (Appendix A5.6) was prepared

that informed the designated haul routes for the delivery of abnormal loads including the identification of all pinch points on the selected routes and swept path analysis and vertical assessments.

Detailed information on the sequencing and methodology required to construct the specific section of the works is detailed in Chapter 5 (Metrolink Construction Phase[2]).

The impact assessment assumes that the proposed infrastructure changes in the AZ3 Dardistown to Northwood Section associated with BusConnects will be in place.

9.6.1.2.3.1 Public Transport Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to the public transport network during this scenario, with a summary of the significance of the impacts presented in Table 9.82. Overall, there will be a short-term, Slight Negative Impact on bus journey times and on bus stops in the area.

Table 9.82:Public Transport Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
Dardistown Depot (all links)	No impact on bus journey times. Relocation of stop 327 on R108 approx. 50m	Negligible- 50m relocation of stop, no impact to services	Medium- Low sensitivity of existing services, High sensitivity of proposed Orbital Route serving Old Airport Road	Short-term, Slight, Negative
M50 Viaduct	Closures on M50 Motorway Junction 4	Negligible- works limited to nights when service does not operate	Low- Route 42d operates once daily at 7.30am	Short-term, Imperceptible, Negative
R108 Ballymun Road (Northwood Station)	Reduced to two lanes in each direction during all phases causing delay to bus journey times. Alterations to junction capacity during multiple phases	Low- 2 to 3min delays to journey times	High – E Spine route in BusConnects programme,	Short-term Slight Negative
R108 Ballymun Road (Northwood Station)	Relocation of Stop 322 less than 100m from current location	Medium- 100m relocation	High- Proximity to Gulliver's Retail Park, E Spine Route	Short-term Moderate Negative

During the main Construction Phase associated with Dardistown Station and Depot there is expected to be limited impact on the existing nearby public transportation network. TTM will need to be put in place during site establishment, and when abnormal loads require access to the site. Bus Stop 327 on the R108 will be Ballymun Road will be relocated approximately 50m to the south of its existing location but will not impact on journey times of services using this stop, therefore resulting in a negligible impact on public transport users in this area.

[2] ML1-JAI-EIA-SC01_XX-RP-Y-00010

The Enabling Works and Main Works associated with the M50 Viaduct will result in no notable impact on public transport services. The existing Dublin Bus service 42d, which utilises Junction 4 as part of its designated route, will not be impacted during the works as all the full closures occur during nights, when this service does not operate.

During the Enabling Works associated with the Northwood Station, the journey times for public transport will see a slight impact. This is due to the reduced capacity along the R108, reduced to two lanes in each direction during all phases.

There are a number of local services which will be affected by the capacity reduction as well as an inter-city service. The services affected are:

- Local services 4, 13, 17a and 155; and
- Intercity service 109A, which runs hourly between Dublin and Kells.

The Main Works associated with Northwood Station will have a short-term, Slight, Negative impact on public transport services and infrastructure. Bus journey times are affected as bus lanes along the R108 will be realigned. The services impacted by the construction phase on this section are Services 4, 13 and 155 operated by Dublin Bus, service 17A from GoAhead bus service and service 109A by Bus Eireann. Bus Stop 332 near Gulliver's Retail Park will be relocated on the northbound carriageway during Phase 1, less than 100m from current location.

In addition to this, the buses travelling to/from the Harristown depot will also experience some additional journey times, in particular the buses returning to the depot.

9.6.1.2.3.2 General Traffic Construction Impact Assessment

For this section, calculations for construction vehicle numbers are for the Dardistown Depot, M50 Viaduct and Northwood Station and Northwood Portal. Table 9.83 presents a summary of the construction vehicles numbers associated with the construction sites in this section. The daily range of movements are noted, however some of the Construction Phase has daily movements below this range.

The STMP (Appendix A9.5) provides details of the proposed haulage route for the construction vehicles.

Table 9.83: Construction Vehicles Numbers in AZ3 Dardistown

Construction Vehicles	Total	Average Daily Range	Maximum Daily Movements	Duration of Maximum Weekly Movements
Dardistown Depot	~306,000 movements	100-300 movements per day, majority of the construction period has daily vehicle movements below this range	510 movements for 2 days	2,384 movements for approximately 1 week
M50 Viaduct	~ 5,000 movements	40-50 movements per day, majority of construction period has daily movements below this range	60 movements for 1 day	248 movements for approximately 1 week
Northwood Station	~275,000 movements	100-250 movements per day, times when daily movements are lower than this range	424 movements per day for approximately 2 days	2,450 movements for approximately 1 week

The STMP (Appendix A9.5) details the impacts to the road network during this scenario, with a summary of the significance of the impacts presented in Table 9.84.

Table 9.84: General Traffic Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
Dardistown Depot	Two existing priority junctions used for Dardistown, on Old Airport Road and on R108. Plus one new priority junction on R108 for temporary access. Increase in HGVs for site access	Low- increase in HGVs for site access	Medium- Regional Road Network	Short-term, Slight, Negative
M50 Viaduct	Hard shoulder closure during all phases. Phase 1: Lane loss on the eastbound on-slip. Phase 3: Speed restrictions (80kph) in place on the main carriageway. In addition, there will be a one-off night-time closure of M50 Motorway Junction 4 on and off slips and main carriageway.	Moderate- Delays of approx. 4mins	Low- National/Strategic Road Network	Short-term, Moderate, Negative
M50 Viaduct	Night closures of eastbound on-slip and westbound off-slip at Junction 4, as well as closure of the main carriageway	Low- Short duration of TTM	Low- M1/M50 Motorway Strategic Road Network	Short-term, Slight, Negative
R108 Ballymun Road/St Margaret's Road	Reduction to 2 lanes in each direction during all phases will increase traffic flows up to 25%, alterations to junction capacity during multiple phases	High- 25% increase in flows	Medium- Regional Road Network	Short-term Moderate Negative
R108 Ballymun Road/Santry Avenue	Reduction to 2 lanes will increase delays of up to 1min	Low- Delays of up to 1min	Medium- Regional Road Network	Short-term Slight Negative
R108 Ballymun Road	HGV routeing profile takes several stations worth of site vehicles through this area	Very High	Medium- Regional Road Network	Short-term Significant Negative

The proposed Dardistown Depot requires the closure of part of Ballystruan Lane. This closure severs access to an existing private wastewater treatment plant, however the new access road to Old Airport Road will re-establish this access.

There is an increase in HGV volume in the local area, primarily on the R108 north of M50 Motorway junction 4 between 2% and 3% during the morning peak. During the evening peak, the HGV volume along the R108 is highest at 3%. During both the morning and evening peaks, the HGV impacts are highest along Silloge Green at 12% in the morning and 30% in the evening, however this increase only equates to a minimal increase in actual HGV movements during both the morning and evening peak.

Results indicate that the restrictions put in place due to the works at the M50 Viaduct will have a slight impact on traffic volumes in the local area. During both peak periods there is a small decrease in volume on the M50 Motorway main carriageway (mainly between 1% - 2%). This loss in volume results in very minor increases in traffic volume on local roads to the south of the M50 Motorway Junction 4.

The speed restrictions in place at the area of works will result in a small journey time increase on the main carriageway (travel time between J3 and J5 increases by up to 20 seconds). The removal of one lane on the eastbound on-slip will result in a moderate increase in delay on vehicles accessing the M50 Motorway during most scenarios, however a delay of 231 seconds (~ 4mins) occurs in the evening peak period.

The HGV volumes for the M50 Viaduct works are slight according to STMP ratings, with the highest increase of 16 HGVs during the morning peak and 13 HGVs during the evening peak along the M50 Motorway.

The closures on the M50 Motorway junction 4 which are associated with the M50 Viaduct construction phase have a slight impact on general traffic users. The slight rating is awarded due to the short-term nature of the TTM.

Depending on journey origin and destination there are two primary diversions during the full closure of the westbound off-slip. Traffic originating from the north would use M1 junction 2 to exit onto the Airport Roundabout and route via Old Airport Road to approach M50 Motorway Junction 4 from the north. Where traffic is originating from the Port Tunnel, the M50 Motorway Junction 2 would be utilised to approach from the east. The closure of the eastbound on-slip would use the same routing methodology depending on origin and destination profiles. During the mainline closure, vehicles will be required to use the slip roads at Junction 4 to bypass the works.

Analysis of the traffic flow changes due to the Enabling Works at the Northwood Station indicate that there are high levels of traffic redistribution in the local area, resulting in the STMP impact categorisation of severe. The modelling indicates traffic redistribution in local area to avoid local junctions where capacity has been reduced, specifically the junctions along the R108. The largest increase in volume is on R108/St Margaret's Road where an increase of up to 25% in traffic volume is identified on the west approach arm, while the largest decrease in volume is on the R108/Northwood Ave junction where up to a 43% decrease in traffic volume is identified on east approach arm.

The redistribution of traffic in the local area highlighted above results in a moderate impact in driver delay during the Enabling Works, specifically on junction approaches. The largest increase is on R108/Santry Avenue junction during both AM and PM peak periods where delays on the approach arms are up to 138 seconds in the AM peak and 169 seconds in the PM peak. There are also small increases on R108/St Margaret's Road and R108/Northwood Ave junctions during AM and PM peak periods.

The Main Works Temporary Traffic Management for Northwood station construction site has been developed as a hybrid option of two previously considered options and represents the most effective choice to maintain capacity as best as possible and to minimise any potential impact on the strategic road network. Analysis on a range of options and junction configurations were used to inform this arrangement

During the Main Works at the Northwood Station, the realignment of the R108 and subsequent reduction in capacity will result in a re-distribution of traffic in the local area. During both peak periods, along the R108 at this section; an increase is recorded on the northbound carriageway of 53% in the morning peak and in the evening peak, a reduction in traffic flows of 10% is recorded. The increases in volume are

consistently recorded on the western approach arm at the St Margaret's Road/R108 junction, where there is a 34% increase in traffic during the morning peak and 62% increase during the evening peak.

The increased southbound movements along R108 Ballymun Road will result in some increased journey times and queueing during peak morning hours, specifically at the Ballymun Road/Santry Avenue/Balbutcher Lane signalised junction. Increases in driver delay in areas along the R108, specifically at Santry Avenue and Northwood Avenue junctions, are recorded during peak morning periods, with the morning peak showing the highest delays, with additional driver delay of 50 seconds.

Model outputs indicate that there will be a minimal increase in HGV volume in the area around the Northwood station. In both the morning and evening peaks, HGV increases are 1% in both directions along the R108. The highest increase in HGV flows, of 8-13%, occurs on the slip road connecting the R108 northbound, north of St Margaret's Road to the M50 Motorway. R108 northbound, north of St Margaret's Road and this is seen in the morning peak. During the evening peak, the volume of HGVs in the area is lower than the morning peak. The only HGV increase along the R108 is 1-2% and occurs southbound between Junction 4 of the M50 Motorway and St Margaret's Road.

9.6.1.2.3.3 Pedestrian Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to pedestrians during this scenario, with a summary of the significance of the impacts presented in Table 9.85. The construction of Dardistown Depot and M50 Viaduct will have a short term Imperceptible negative impact on pedestrians.

Table 9.85: Pedestrian Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
Dardistown Depot	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited pedestrian demand in vicinity	Short-term, Imperceptible, Negative
M50 Viaduct	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited pedestrian demand in vicinity	Short-term, Imperceptible, Negative
R108 Ballymun Road Realignment - Pedestrians	Footpath closures in phase 2 and phase 3, and closure of signalized crossing in phase 2.	Low- closures however footways provided in all phases, so movements are maintained	Medium-Proximity to Gulliver's Retail Park	Short-term, Slight, Negative
Main Works				
Dardistown Depot	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited pedestrian demand in vicinity	Short-term, Imperceptible, Negative
M50 Viaduct	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited pedestrian demand in vicinity	Short-term, Imperceptible, Negative
R108 Ballymun Road Realignment - Pedestrians	Footways retained on both sides of R108 and St Margaret's Road throughout all phases of works.	Low- Realignment of footways results in additional 100m distance	Medium- Proximity to Gulliver's Retail Park	Short-term, Slight, Negative

During most phases of Enabling Works associated with Northwood Station, footways are either retained as they are, or alternative footways are provided throughout. However, the reconfiguration of the signalised crossing at Northwood Avenue during Phase 2 results in an approximate 200m-350m additional journey length for pedestrians due to the removal of the crossing point across the R108.

Further to this, there is a full closure of the west and east footway on R108 during Phases 2 and 3 respectively, however, these works to be undertaken at nights. This is a residual impact of the proposed TTM measures, it will be removed once the Construction Phase is complete.

Footways are retained on both sides of the R108 Ballymun Road during the Main Works at Northwood Station. There will be a slight increase in journey length for pedestrians during Phase 1, where the realignment of the main carriageway, and the associated footways, result in additional distance of approximately 100m.

9.6.1.2.3.4 Cycle Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to cyclists during the Construction Phase, with a summary of the significance of the impacts presented in Table 9.86

Table 9.86: Summary of Construction Impact on Cycle Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
Dardistown Depot	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited cycle demand in vicinity	Short-term, Imperceptible, Negative
M50 Viaduct	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited cycle demand in vicinity	Short-term, Imperceptible, Negative
R108 Ballymun Road Realignment- Cyclists	Removal of southbound cycle facility during Phase 3. Cycle lane/ways provided in other phases.	High- cycle facility not replaced in Phase 3, requirement to use traffic lane	High- Secondary Route	Short-term Significant Negative
Main Works				
Dardistown Depot	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited cycle demand in vicinity	Short-term, Imperceptible, Negative
M50 Viaduct	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited cycle demand in vicinity	Short-term, Imperceptible, Negative
R108 Ballymun Road Realignment- Cyclists	Retained/realigned cycle lanes of the R108 during all phases.	Low- cycle movements maintained	High- Secondary Route	Short-term Slight Negative

During the Enabling Works at Northwood Station, cycle lanes are included as part of the TTM during most phases, in both directions. However, during Phase 3 the cycle lane is removed on the R108 southbound carriageway between St Margaret's Junction and Northwood Avenue Junction for a duration of between 2 and 4 weeks. This will require cyclists to use the general traffic lane during these works, resulting in a severe impact regarding cyclist safety and quality of cycle infrastructure.

During both phases of main works, the segregated cycle lanes that have been added as part of the BusConnects scheme will remain operational in both directions along the R108.There will be slight increase in journey length for cyclists during Phase 1, where the realignment of the main carriageway,

and the associated cycle lanes, result in additional distance of approximately 100m. The realigned cycle lanes will result in a slight negative safety impact, especially related to the close proximity to live traffic, including increased volumes of HGVs.

This is a residual impact of the proposed TTM measures. However, it will be removed once the Construction Phase is complete.

9.6.1.2.3.5 Parking and Loading Construction Impact Assessment

The construction of the Dardistown Depot and M50 Viaduct will have a short term Imperceptible Negative impact on parking or loading facilities.

The STMP (Appendix A9.5) details the impacts to parking and loading during the Construction Phase, with a summary of the significance of the impacts presented in Table 9.87.

Table 9.87: Parking and Loading Impact Construction Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works and Main Works				
Dardistown Depot	TTM required during site establishment and for abnormal loads	Negligible- limited TTM necessary	Low- Limited demand in vicinity	Short-term, Imperceptible, Negative
M50 Viaduct	Closure of M50 Motorway Junction 4	Low – Night-time closure only	Low- Limited demand in vicinity	Short-term, Slight, Negative
Northwood Station	Access road for Gulliver's Retail Park to be realigned, impact of reduced capacity of R108	Low- access maintained	Medium- Commercial/retail loading	Short-term Slight Negative

The closures on the M50 Motorway junction 4 which are associated with the M50 Viaduct construction works have a slight impact on commercial vehicles. The slight rating is awarded due to the short-term nature of the TTM. Commercial vehicles would utilise the same diversion methodology as outlined for local access.

Depending on journey origin and destination there are two primary diversions during the full closure of the westbound off-slip. Traffic originating from the north would use M1 junction 2 to exit onto the Airport Roundabout and route via Old Airport Road to approach M50 Motorway Junction 4 from the north. Where traffic is originating from the Port Tunnel, the M50 Motorway junction 2 would be utilised to approach from the east. The closure of the eastbound on-slip would use the same routing methodology depending on origin and destination profiles. During the mainline closure, vehicles will be required to use the slip roads at Junction 4 to bypass the works.

During the Enabling Works at Northwood Station, there will be no diversions in place for commercial deliveries, however the reduced capacity on the R108 during the works will increase in journey times as outlined in driver delay criteria impacting local operations.

There will be no impact on commercial/retail loading bays or parking during the Enabling Works.

There will be a slight impact for loading facilities along Old Ballymun Road which serve as an access road for Gulliver's Retail Park service vehicles and Tesco Distribution Depot. These will need to be realigned to maintain commercial access to these facilities. There will be no impact on designated on-street parking locations due to the proposed traffic management.

9.6.1.2.4 AZ4 Northwood to Charlemont

This section of the chapter presents a description of the impact on the public transport, road, pedestrian, cycle and parking networks of the AZ4 Northwood to Charlemont. A full description of the AZ4 Northwood to Charlemont Section can be found in Chapter 4 (Description of the MetroLink Project). The stations and construction sites within this section include:

- Ballymun;
- Collins Avenue;
- Griffith Park;
- Glasnevin;
- Mater;
- O'Connell Street;
- Tara Street;
- St Stephen's Green; and,
- Charlemont.

Further details on the construction impacts can be found in the STMP (Appendix A9.5) and Chapter 5 (MetroLink Construction Phase).

Construction site access to Ballymun Station is on Shangan Road, to the west of the Shangan Road and Ballymun Road Junction. The site exit is on Sillogue Road which is adjacent to the southern perimeter of the site.

At Collins Avenue, there will be two main construction areas throughout the various construction stages. The primary construction area will be on the eastern side of Ballymun Road. But there will also be an island site on Ballymun Road to construct the elements of the station that are located under the carriageway. The main site access routes for access to and from the Collins Avenue Station construction site will be via the R108 Ballymun Road to and from the M50 Motorway.

At Griffith Park Station, the majority of the construction site boundary is within the grounds of Home Farm Football Club, however the construction site's western boundary extends out from the football club grounds to the onto the footway on R108 St Mobhi Road. The majority of enabling works are unlikely to impact on the functioning of the immediate traffic network. However, the existing retaining wall on the eastern side of St Mobhi Road will be demolished and this will likely result in the temporary closure of the footway on this side of the road.

There are two entrances to the site boundary associated with the Construction Phase at Glasnevin Station. The area north of the Newbridge/Hazelhatch railway line is considered the Northern site area, while the area south of this is considered the Southern site area. The proposed site entrances will be from Prospect Road and will be adjusted several times during the phasing of the works. In general, where the site access points are relocated, the change in location is minimal and will result in little change in impact to the local or wider transport network.

During works at Mater Station, the site boundary will mainly remain static, with the main construction site being located to the east of Berkeley Road and south of Eccles Street. In order to construct the northwest vent-shaft, another site compound will need to be established.

Works at O'Connell Street Station will follow two potential construction scenarios due to a potential oversite development at this location. One scenario will include the oversite development of a mixed-use quarter by Hammerson that will occur before the construction of the O'Connell Street Station, and the second scenario will be based on if the mixed-use quarter does not go ahead. The site footprint will stay broadly the same during each scenario, with the primary difference being the site extent to the eastern perimeter of the site and the provision of an area west of Moore Lane for offices/compound/logistics during Scenario 2.

During the Enabling Works for Tara Station site, the demolition of a number of buildings between R802 Tara Street and Luke Street will be required. During this phase Luke Street will be closed to traffic and

pedestrians, and there will be some loss of footway width on Townsend Street and Tara Street. During the Main Works construction, the site footprint is not expected to vary in size between phases. The access to the construction site will be from Townsend Street, which is a one-way street flowing eastbound, and will therefore require all site traffic to approach from the west of the site. Site traffic leaving the construction site will exit directly onto Tara Street, which is a one-way street with a northbound flow.

At St Stephen's Green, the site footprint remains the same size throughout construction period. The site location will result in a loss of northbound traffic lane on the R138 and parking on the western side of the R138. The road configuration on R138 will be altered throughout the construction period. The proposed site entrance is located in the northbound nearside lane; therefore, the two existing lanes of northbound traffic will have to merge in advance, with the appropriate traffic management measures. The TTM arrangements at this station have been developed based on the road layout in place in 2020, it does not consider the temporary arrangement installed in the summer 2021 period.

Access to Charlemont Station site will be provided either from Grand Parade or alternatively from Dartmouth Road. The localised construction traffic routeing to and from the various site accesses will require consideration of the local traffic restrictions along Grand Parade and the junctions which intersect it. Due to banned movements on Grand Parade, inbound movements to the south site will need to route via the R114 gyratory to the north. When the full closure on Dartmouth Road is in place, inbound and outbound traffic will route via Dartmouth Road, R138 and Grand Parade.

A part of the site will be developed prior to construction of the Charlemont Station as detailed in Chapter 4 (Description of the MetroLink Project) by a separate oversite development (Two Grand Parade). This site is also a TBM reception site which will be used to extract the TBM after completion of the Dublin central section. Chapter 5 (MetroLink Construction Phase) details how abnormal loads will be dealt with throughout the Construction Phase. Furthermore, an Abnormal Load Route Survey Report (Appendix A5.6) was prepared that informed the designated haul routes for the delivery of abnormal loads including the identification of all pinch points on the selected routes and swept path analysis and vertical assessments.

9.6.1.2.4.1 Public Transport Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to public transport during this scenario, with a summary of the significance of the impacts presented in Table 9.88.

Table 9.88: Summary of Construction Impact on Public Transport Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
Ballymun Station	No diversions in place	Negligible- no diversions in place	High- Core Bus Corrido	Short-term, Imperceptible Negative
R108 Ballymun Road-Collins Avenue Station	Bus stop 115 to be relocated 70m	Low- <100m relocation	High- Bus Services of less than 15mins, Bus Connects Spine Route	Short-term Slight Negative
R108 St Mobhi Road-Griffith Park Station	Removal of southbound bus lane increases bus journey times by up to 4 seconds	Negligible- 4 second delay to bus journey times	High- Bus Services of less than 15mins, Bus Connects Spine Route	Short-term Imperceptible Negative
R108 Prospect Road	Removal of approximately 90m of northbound bus lane	Low- 90m loss of northbound bus lane	High- Bus Services of less than 15mins, Bus	Short-term Moderate Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
			Connects Spine Route	
Berkeley Road	Temporary shuttle signals on Berkeley Road. Slight increase in journey times associated with traffic signals	Low- delays of up to 20seconds	Medium- BusConnects Oher City Bound Route	Short-term Slight Negative
Berkeley Road	Bus stop 795 to be temporarily relocated due to close proximity to traffic signals	Low- Route timetable will not be impacted	Medium- Not part of Spine route	Short-term Slight Negative
O'Connell Street	Negligible- no bus stops/services impacted	Low- no stops/services affected	High- City centre bus services, presence of Luas Green Line	Short-term Imperceptible Negative
Poolbeg Street	Alterations to existing bus routes which utilise Poolbeg Street	Low-minimal delays to bus journey times	High- City Centre bus services	Short-term Slight Negative
Luke Street	Alterations to existing routes which utilise Luke Street	Low-minimal delays to bus journey times	High- City Centre bus services	Short-term Slight Negative
Hume Street	Diversion of existing bus services using Hume Street and SSG East	Low- delay if 100s during PM peak	High- City Centre bus services	Short-term Slight Negative
Hume Street	No removal of bus stops but use of existing bus stops on Earlsfort Terrace and Leeson Street for services diverted due to Hume Street Closure	Medium- alternative stops located 200-300m from existing	High- City Centre bus services	Short-term Moderate Negative
Charlemont Luas	Negligible- operation and access will not be affected	Negligible- elevated track at this section	High- Luas Green Line	Short-term Imperceptible Negative
Main Works				
R108 Ballymun Road-Ballymun Station	Relocation of bus stop 94 on northbound carriageway	Low- Service maintained	Medium	Short-term Slight Negative
R108 Ballymun Road-Collins Avenue	Realigned carriageway with retention of 3m bus lane in both directions. Relocation of bus stop 115 to north of site approx. 70m	Low- pedestrian diversions of approximately 100m to reach new bus stops	High- Bus Services of less than 15mins, Bus Connects Spine Route, however routes not impacted	Short-term Slight Negative
R108 St Mobhi Road-Griffith Park Station	Removal of southbound bus lane increases bus journey times by up to 4	Negligible- 4 second delay to bus journey times	High- Bus Services of less than 15mins, Bus Connects Spine	Short-term Imperceptible Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
	seconds. Bus priority signal north of site		Route	
R108 Ballymun Road-Glasnevin Station	Bus lanes maintained, services are not impacted	Negligible- site does not encroach on network	High- Bus Services of less than 15mins, Bus Connects Spine Route	Short-term Imperceptible Negative
Western Commuter Line Maynooth to Docklands	Closure for 21 months	Very High- almost 2year line closure	Very High- ability to interchange with other lines serving rest of Ireland	Short-term Significant Negative
South Western Commuter Line Maynooth and Phoenix Park to Connolly	Closure for 5 months	Moderate- 5month closure	Very High- ability to interchange with other lines serving rest of Ireland	Short-term Significant Negative
Eccles Street	Closure of Eccles Street to general traffic (Emergency Vehicle Access only)	Low- no bus services use Eccles Street	High- distributes traffic to surrounding local roads	Short-term Moderate Negative
Berkeley Road	Realigned Berkeley Road- relocation of bus stop 818	Low- Temporary relocation south of existing stop. Does not impact service routing	Medium- Not part of Spine routes	Short-term Slight Negative
Berkely Street	BusConnects Other City Bound Routes	Low	Medium	Short-term Slight Negative
O'Connell Street	Negligible- no bus stops/services impacted	Low- no stops/services affected	High- City centre bus services, presence of Luas Green Line	Short-term Imperceptible Negative
Poolbeg Street	Alteration to existing routes which utilise Poolbeg Street. Relocation of existing bus stop along Poolbeg Street- stop 7564 and removal of set down area	Low- equidistance diversion via Tara Street	High- City centre bus services	Short-term Low Negative
Luke Street	Delay to bus journey times due to closure of Luke Street	Low- Removal of bus set down in this area	High- City centre bus services	Short-term Slight Negative
R138 St Stephen's Green East	Reduced capacity along SSG East, loss of one lane northbound and partial loss of one bus lane southbound	Low- partial loss of southbound bus lane	High- City centre bus services	Short-term Slight Negative
R138 St Stephen's Green East	Bus stop 844 relocated to stop 842 location	Low- relocation of approx. 75m	High- City centre bus services	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Charlemont Luas	Negligible- operation and access will not be affected	Negligible- elevated track at this section	High- Luas Green Line	Short-term Imperceptible Negative

Ballymun

At Ballymun Station, there will be no diversions in place on the local road network during the Enabling Works, and therefore there will be a short-term, Imperceptible Negative Impact on the public transport network at this stage. During the Main Works, there is minimal expected impact on bus routeing, however the bus shelter on Ballymun Road northbound footway adjacent to the site will need to be moved slightly north and replaced with a new temporary stop.

The bus lane on Ballymun Road is unaffected by the works and there will be no negative impact on public transport journey times during the construction period.

The works associated with Ballymun Station will have a short-term Slight negative impact on public transport services and infrastructure. Bus journey times will not be affected; however, bus stop 94 will be relocated north of the construction site. The services impacted by the construction phase on this section are Services 4, 13 and 155 operated by Dublin Bus. Services 17A, and 200 operated by GoAhead bus service.

Collins Avenue

The TTM for the Enabling Works at Collins Avenue demonstrates that a bus lane will be maintained in both directions during all phases. As a result, journey times for public transport are unlikely to be significantly impacted. Bus Stop 115 will be relocated approximately 70m during phases of the Enabling Works, and this is expected to only have a slight impact on users, specifically regarding the small increase in journey time by foot to reach the relocated bus stop.

During the Main Works at Collins Avenue Station, the provision of continuous bus lanes along Ballymun Road northbound and southbound as part of the TTM will minimise potential delays to bus services, however bus stop 155 will be relocated north of the construction site. The services impacted by the construction phase on this section are Services 4,9, 13 and 155 operated by Dublin Bus.

There will be an impact on the access to the bus stop 115 from the residential area in Albert Collins Avenue. Currently access to the bus stop is via Albert College court, however due to the road closure associated with construction phase bus users will be required to access the new temporary bus stop via the temporary path to the east of the church (additional distance of less than 100m). Alternatively, the existing bus stop 37 on Ballymun Road can be used (additional distance of approximately 100m).

Griffith Park

Analysis outputs show that during both the Enabling Works and Main Works, an increase in delay due to the TTM at Griffith Park will be approximately four seconds during the morning peak and one second in the evening peak.

The provision of the bus priority gate on the southbound lane of St Mobhi Road, to the north of the site, will minimise potential delays to any of the bus routes that travel on this section of the route. The bus stops in close vicinity to the construction site are stops 147 and 149, both located on St Mobhi Road, which serves routes 4, 9 and 155. None of the bus stops will be impacted by the proposed traffic management.

The Main Works associated with Griffith Park Station will have a slight impact on public transport services and infrastructure. In this area one southbound bus lane will be removed during construction.

There will not be alterations to the bus stops here. The services impacted by the construction phase on this section are Services 4,9, 11, 83; including 83a; and 155 operated by Dublin Bus.

As part of the BusConnects project, a bus gate will be operational at the northern end of St Mobhi Road between the hours of 16:00 and 20:00 daily. This will mitigate further bus delays at this location.

Glasnevin

At Glasnevin Station, the removal of a small section bus lane on the northbound carriageway on Prospect Road during the Enabling Works results in a short-term, Slight, Negative impact on public transport services. Due to public transport using the general traffic lane at this section of road, there is a slight increase in bus journey times on Prospect Road during peak periods of approximately 40 seconds.

The following bus services will be impacted by this delay when routing northbound:

- Services 4, 9, 40, 83 and 83a, 140, 155 all operated by Dublin Bus.

During the Main Works at Glasnevin Station, bus services or infrastructure will not be adversely impacted during construction.

The Main Works construction period will result in the closure of two rail lines during the works. Depending on the contracting processed to deliver this works, The Western Commuter Line (Maynooth to Docklands) will either be closed for 21 months as one long-term closure, or there will be 2 separate long-term closures lasting 3 months and 16 months respectively. In both circumstances there will a number of temporary closures (20 to 30) occurring at night-time and weekends. As a result, the Western Commuter Line will terminate at Broombridge for intercity trains, allowing for easy interchange with Luas and other local bus or train services for passengers to continue their onward journey.

The Southwestern Commuter Line (Maynooth and Phoenix Park to Connolly) will also be affected by the Main Works. Depending on the contracting processed to deliver this works, there will either be one long-term closure, lasting either 5 months or 1 month. In both circumstances there will be a number of temporary closures, 16 or 52 respectively to occur during night-times and weekends. As such, the Southwestern Commuter Line will terminate at Heuston Station, whereby passengers can utilise other local trains, Luas or bus services to continue their journey.

Mater

During the Enabling Works at Mater Station, bus journey times on Berkeley Road are impacted by the single flow of traffic caused by the shuttle signals. During the morning peak the delay caused by the shuttle signals is 15seconds additional delay for northbound traffic and 20seconds for southbound traffic. During the evening peak the delay caused by the shuttle signals is similar to the morning peak; 18seconds additional delay for northbound traffic and 19seconds for southbound traffic. Future BusConnects Other City Bound Routes 34, 35, 36 and 48 will be impacted by the Main Works along Berkeley Street however these are of Medium sensitivity as they are not part of any spine and operate on their own timetable, thus reducing the significance of the impact.

During the Main Works, two bus stops within the immediate proximity of the site on Berkeley Road, stop 818 and 795, which will need to be temporarily relocated along Berkeley Road due to the road realignment. The works associated with Mater Station will have a slight impact on public transport services and infrastructure. The realignment along Berkeley Road and closure of Eccles Street will cause an increase for journey times around this station site. The services impacted by the construction phase on this section are Services 38; including 38a, 38b and 38d; 46a and 120 operated by Dublin Bus. Buses currently do not route down Eccles Street, therefore there is no impact on bus services during its closure.

O'Connell Street

It is anticipated that there will be a short-term Imperceptible negative impact on bus stops and bus routes as a result of both the Enabling Works and Main Works at O'Connell Street Station. There are existing Luas lines on Parnell and O'Connell Street, and they are not expected to be impacted during either phase of works.

Tara Street

The construction of Tara Station will result in a range of slight impacts on bus services and infrastructure in the local area during both the Enabling Works and the Main Works.

The changes to existing routes and diversions via Poolbeg Street and Luke Street will result in a slight-to-negligible impact regarding journey times. The services impacted by the construction phase on this section are Service 47 and 65 operated by Dublin Bus, both of which originate and terminate at the Poolbeg Street Bus Stop 7564. These bus routes would have to be relocated on Poolbeg Street further west between Hawkings Street and Tara Street in order to mitigate the closure and restricted access to Poolbeg Street east. The existing bus service overview in the area is illustrated in Diagram 9.42, and the proposed alterations are highlighted in Diagram 9.43.

The closure of Luke Street between Townsend Street and Poolbeg Street impacts the existing bus termini/set down area which is utilised by bus services which originate on Poolbeg Street (Dublin Bus routes 47, 65 and 65b). The works will result in the removal of this set down area.

The BusConnects network redesign indicates that Poolbeg Street or Luke Street will not form part of the city centre Spine or Other City Bound routes and therefore the impact of the construction phase at Tara Station are expected to have a slight impact on public transport.

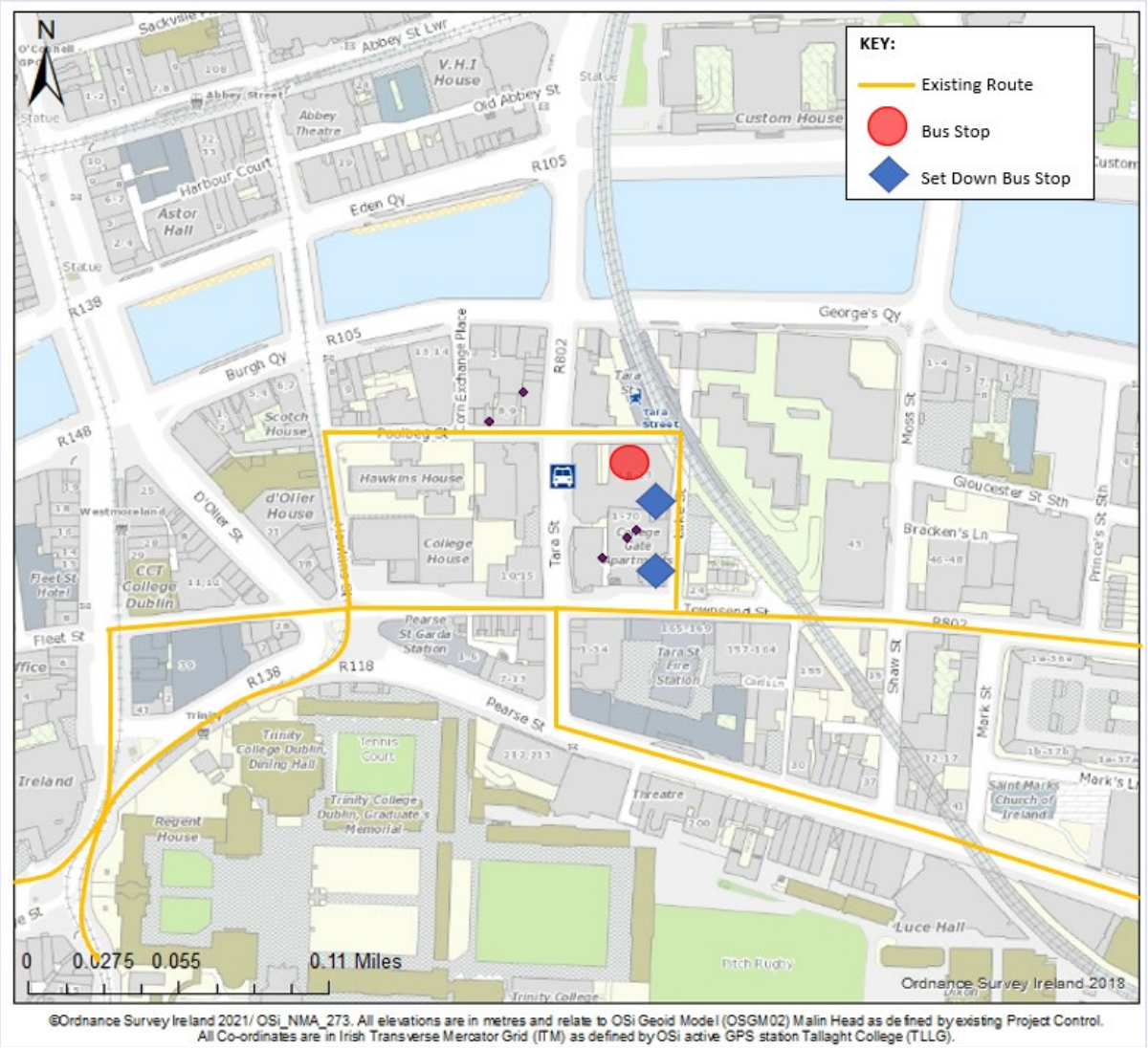

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Diagram 9.41: Existing Bus Routes at Tara Station Site

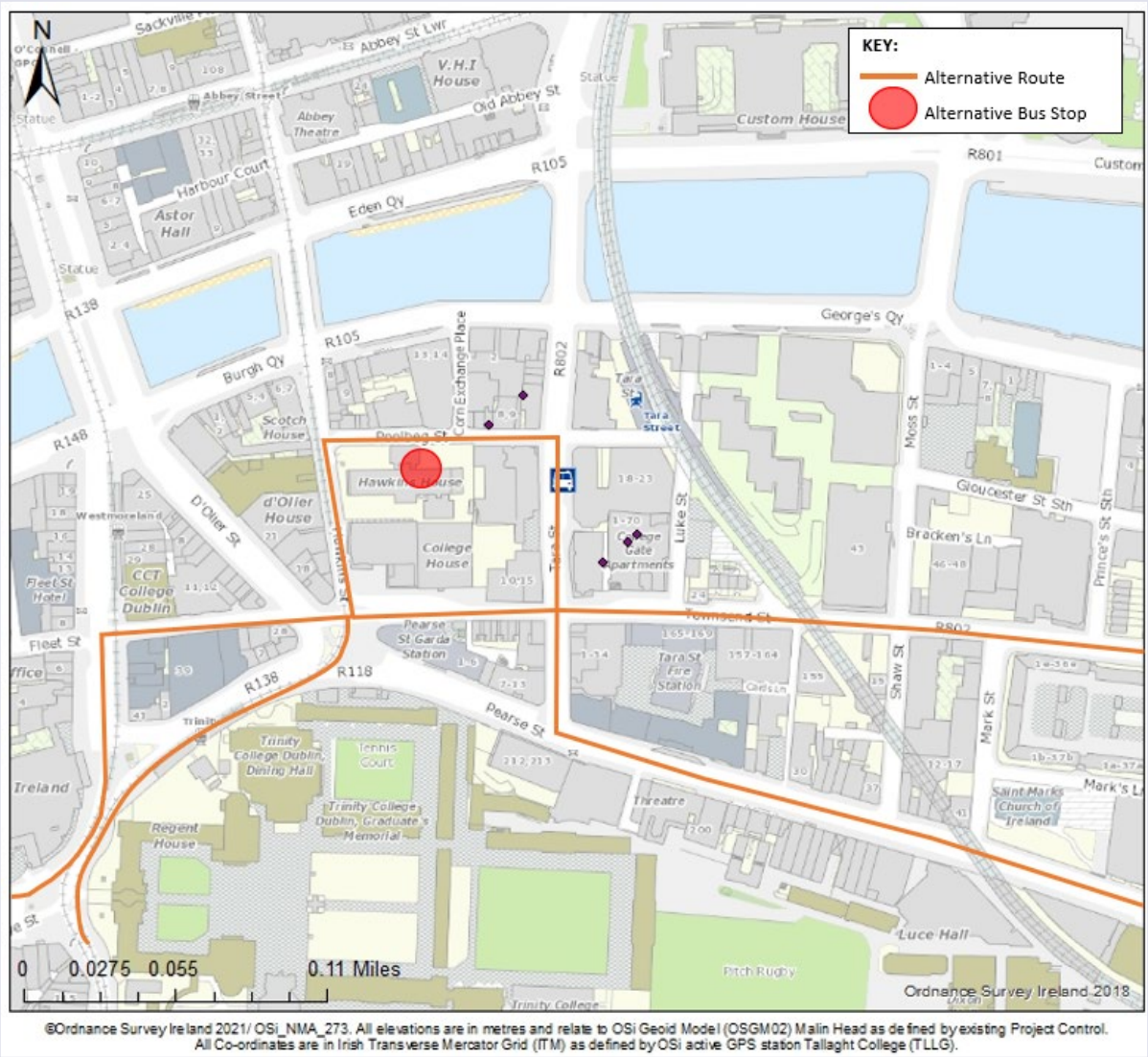

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Diagram 9.42: Alternative Bus Routes at Tara Station Site

St Stephen's Green

Enabling Works at St Stephen's Green Station will have a slight impact on the bus journey times and moderate impact on any alterations to bus stops. Due to the closure of Hume Street, bus routes will be diverted away from the closures along Pembroke Street and Leeson Street. Bus stops along these diversion routes will be required support users for all bus services, including the diverted services.

The Main Works associated with St Stephen's Green Station will have a slight impact on public transport services and infrastructure. The reduced capacity of one lost lane northbound and partial loss southbound along St Stephen's Green East will cause this delay in journey times. The services impacted by the construction phase on this section are Service 10, 11, 12, 37, 44, 46a, 84x, 145 and 155 operated by Dublin Bus and Service 133 operated by Bus Éireann. Bus services 500 and 504 operated by Swords Express are also affected. With the provision of the bus lanes, there will be no significant impact, however when routeing southbound, vehicles will now not have an opportunity to overtake buses which are stopped at bus stops. Alternatively, the bus stop may be temporarily moved to a different location to allow traffic to flow consistently.

Charlemont

During the Enabling Works and Main Works at Charlemont Station, there is expected to be a Short-term Imperceptible Negative impact on bus services in the local area. The station construction site is within close proximity to Charlemont Luas Station. This section of the Luas line is elevated, and its service

operation should not be impacted by the Construction Phase. Access to the station platforms for pedestrians will not be affected during the works.

9.6.1.2.4.2 General Traffic Construction Impact Assessment

For this section, calculations for construction vehicle numbers are for Ballymun Station, Collins Avenue Station, Griffith Park Station, Glasnevin Station, Mater Station, O'Connell Street Station, Tara Station, St Stephen's Green Station and Charlemont Station construction sites. Table 9.89 presents a summary of the construction vehicles numbers associated with the construction sites in this section. The daily range of movements are noted, however much of the Construction Phase has daily movements below this range.

The STMP (Appendix A9.5) provides details of the proposed haulage route for the construction vehicles.

Table 9.89: Construction Vehicles Numbers in AZ4 City Section

Construction Vehicles	Total	Average Daily Range	Maximum Daily Movements	Maximum Weekly Movements
Ballymun	~ 45,000 movements	40-60 movements per day	124 movements per day for approximately 1 day	602 movements for approximately 2 weeks
Collins Avenue	~ 52,000 movements	40-80 movements per day	118 movements per day for approximately 16 days	588 movements for approximately 2 weeks in total
Griffith Park	~ 66,000 movements	40-80 movements per day	164 movements per day for approximately 2 days	934 movements for approximately 1 week
Glasnevin	~ 58,000 movements	50-100 movements per day	200 movements per day for approximately 2 days only	924 movements for approximately 2 weeks
Mater	~ 51,000 movements	40-70 movements per day	216 movements per day for approximately 2 days	788 movements for approximately 2 weeks
O'Connell Street	~ 70,000 movements	50 -100 movements per day	178 movements per day for 1 day	880 movements for approximately 1 week
Tara Street	~ 57,000 movements	30-60 movements per day	130 movements per day for approximately 6 days	632 movements for approximately 2 weeks
St Stephen's Green	~ 44,000 movements	20-60 movements per day	136 movements per day for approximately 4 days	634 movements for approximately 2 weeks
Charlemont	~ 50,000 movements	20-50 movements per day	210 movements per day for approximately 2 days	1,392 movements for approximately 1 week

The Significant impacts are a residual impact of the proposed TTM measures. However, they will be removed once the Construction Phase is complete.

Table 9.90: Summary of Construction Impact on General Traffic

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R108 Ballymun Road- Ballymun Station	Removal of general traffic lane on R108 northbound and southbound carriageway	Medium- reduction in capacity to one lane in each direction	Medium- Regional Road Network	Short-term Moderate Negative
R108 Ballymun Road /R103 Collins Avenue Junction	Reduced capacity on R108 during various phases. One lane for general traffic in each direction results in increased delays and traffic flow	Medium- delays of 2-4 minutes	High- Regional road network but proximity to school	Short-term Moderate Negative
Local Access to Albert College Court	Diversion of 750m and increase to driver delay	Medium	High- Local Access route	Short-term Moderate Negative
R108 St Mobhi Road	Removal of southbound bus lane increases traffic flows on traffic lanes	Low- 5/6% increase in flows	High- Regional Road network, proximity to schools and Bon Secours Hospital	Short-term Slight Negative
R108 St Mobhi Road	Removal of southbound bus lane increases driver delays on traffic lanes	Negligible- delay of one second	High- Regional Road network, proximity to schools and Bon Secours Hospital	Short-term Slight Negative
Whitehall College of Further Education	Shuttle signals for access to college	Low- access maintained, only occurring at evenings and weekends	Low- low demand on evenings/weekends	Short-term Slight Negative
R108 Prospect Road-	Removal of one bus lane northbound on Prospect Road	Low- increase of 3% on traffic flows (40 second delay)	High- Regional Road network but proximity to heavy rail interchange	Short-term Slight Negative
Eccles Street	Temporary shuttle signals on Berkeley Road during Phases 2.1 to 2.5	Medium- up to 42% increase in volume on eastbound lane	High – Local road	Short-term Moderate Negative
O'Connell Street	Minor increase in HGV volume during peak periods	Low- 3% of mode share	Medium- Local Road in Dublin City Centre with restricted vehicle access	Short-term Slight Negative
R802 Tara Street (and Main Works)	Road closure along Luke Street between Townsend Street and Poolbeg Street. Lane loss on Tara Street	Low- redistribution of traffic on Tara Street Corn Exchange Place- negligible delays	High- Regional Road in Dublin City Centre	Short-term Slight Negative
Merrion Row	Closure of Hume Street will increase	Medium - 7-12% in	High- Local Road in	Short-term Moderate

Link	Description	Magnitude	Sensitivity	Significance of Impact
	traffic flows and driver delays	traffic flows	Dublin City Centre	Negative
R138 St Stephen's Green East	Lane reduction will increase traffic flows and driver delays.	Low- 45second delay	High Regional Road in Dublin City Centre	Short-term Slight Negative
Hume Street- Local Access	Closure of Hume Street and diversion via Pembroke Street and Leeson Street	High- 900m diversion	High- Local Road in Dublin City Centre	Short-term Significant Negative
Grand Parade	Closure of Dartmouth Road leads to ~10% increase in flows on Grand Parade, however only 12s delay	Medium- 10% increase in flows but 12s delay	High – Regional Road network in Dublin City Centre	Short-term Moderate Negative
Main Works				
R108 Ballymun Road – Ballymun Station	Removal of one general traffic lane on R108 in each direction	Low- reduction in capacity to one lane in each direction	Medium- Regional Road Network	Short-term Slight Negative
R108 Ballymun Road /R103 Collins Avenue Junction	Increase in traffic flow due to diverted local traffic and increase in HGVs	High- junction will operate over capacity	High-Regional Road network but proximity to school	Short-term Significant Negative
R108 Ballymun Road /R103 Collins Avenue Junction	Reduced capacity on R108 results in increased delays	High- delays of up to 7mins	High-Regional Road network but proximity to school-	Short-term Significant Negative
Local Access to Albert College Court	Diversion of 750m and increase to driver delay	Medium- 750m diversion	High- Regional Road network, proximity to schools	Short-term Moderate Negative
R108 St Mobhi Road	Removal of southbound bus lane increases traffic flows on traffic lanes	Low- 11-13% increase in flows	High- Regional Road network, proximity to schools and Bon Secours Hospital	Short-term Slight Negative
R108 St Mobhi Road	Removal of southbound bus lane increases driver delays on traffic lanes	Negligible- delay of one second	High- Regional Road network, proximity to schools and Bon Secours Hospital	Short-term Slight Negative
R108 Prospect Road	Current traffic layout maintained, slight increase in flow and multiple site entrances	Low- no lane closures	High- Regional Road network but proximity to heavy rail interchange	Short-term Slight Negative
Mater -Phase 1	All traffic movements maintained on Berkeley Road and Eccles Street	Low- 11 second delay	High – Local Road network	Short-term Slight Negative
Mater-Phase 2	Restricted access to Eccles Street from	Medium – increase of 9% traffic flow on	High-Local Road network	Short-term Moderate Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
	Berkeley Road	Berkeley Road		
Mater-Phase 3	Restricted access to Eccles Street from Berkeley Road	Medium – increase of 9% traffic flow on Berkeley Road	High-Local Road network	Short-term Moderate Negative
O'Connell Street	Minor increase in HGV volume during peak periods	Low- 3% increase in HGV flows	Medium- Local Road in Dublin City Centre with restricted vehicle access	Short-term Slight Negative
Luke Street/R802 Tara Street	Road closure along Luke Street between Townsend Street and Poolbeg Street, lane loss on Tara Street	Medium-500m diversion but minimal impact on driver delay	High- Local and regional roads in Dublin City Centre	Short-term Moderate Negative
R138 St Stephen's Green East and Merrion Street Upper	Reduced capacity along SSG East, loss of one lane northbound and partial loss of one bus lane southbound	Low- minimal queuing on northbound approach to Hume Street junction	High-Regional Road in Dublin City Centre	Short-term Slight Negative
Dartmouth Road	Partial closure of Dartmouth Road. Moderate levels of diversion required, however banned right turn out of Northbrook Road increases journey time	Medium- diversion of approx. 700m	High – Regional Road network in Dublin City Centre	Short-term Moderate Negative

Ballymun

Analysis of the traffic flow changes due to the Enabling Works at Ballymun Station indicate that there are high levels of traffic redistribution in the local area; due to the short-term nature of the works this was categorized as a moderate impact in the STMP. There are high levels off traffic redistribution in the local area to avoid local junctions and sections where capacity has been reduced, specifically along the R108 Ballymun Road.

During the Enabling Works, the largest in volume increase within the vicinity of Ballymun Station is on R108/Shangan Road junction where an increase of up to 49% in traffic volume (44 PCUs) is identified on the west approach arm during the evening peak period. The largest decrease in volume is also on the R108/Shangan Road junction where up to a 45% decrease of traffic volume (319 PCUs) during the morning peak, and 50% decrease of traffic volume (602 PCUs) during the evening peak is identified on southern approach arm. The re-distribution of traffic in this area is caused by the reduced capacity at this station area, but also due to the concurrent Enabling Works at Northwood Station, Collins Avenue Station and Griffith Park Station.

The redistribution of traffic in the local area highlighted above results in an STMP rating of a 'slight' impact on driver delay, specifically on junction approaches. The largest increase is on R108/Shangan Road junction during both AM and PM peak periods where additional delays on the approach arms are up to 45 seconds in the AM peak and 80 seconds in the PM peak. There are also small increases on R108/Sillogue Road junction during AM and PM peak periods.

Analysis of the Temporary Traffic Management layout for Ballymun Station indicates that there will be a slight impact for general traffic users. The reduction in capacity on the R108 results in a slight amount of traffic re-routeing away from the area. During the morning peak period there is a 9% increase in traffic volume on the northbound carriageway and 6% decrease on the southbound carriageway. During the evening peak there is a decrease of 8% in the northbound carriageway and a 12% increase in volume on the southbound carriageway. During both peak periods the redistribution of traffic away from the R108 results in increases in volume on some of the east and west junction approaches along the R108. This change in traffic distribution is a result of the loss of capacity at this section, but also the TTM in place at Northwood Station site where, works are resulting in traffic routeing away from the wider local area.

The reduced capacity on the R108 results in a slight impact for driver journey times. This impact is identified at the Ballymun Road/Shangan Road junction, where there is a small increase in delay for traffic approaching the junction from Shangan Road (east and west). Analysis indicates that the additional delay on the R108 is expected to be negligible.

There will be an increase in HGV flows in the vicinity of the site, mainly on Ballymun Road. This occurs as a result of cumulative traffic generated from the construction at Collins Avenue and Griffith Park Stations. Model outputs indicate there will be an increase in HGV volume of approximately 1% during the peak morning and evening period, in the northbound direction of Ballymun Road (R108), to the east of the site. At this section of road, HGVs, including the proposed Project construction vehicles, account for a 6-8% of all traffic along the R108 during the morning peak, and 2-4% in the evening peak.

The Stage 2 impact assessment for Ballymun Station indicates that there will be no diversions or road closures that will impact local access in the vicinity of the station construction area.

Collins Avenue

At Collins Avenue Station, the TTM associated with the Enabling Works will result in a slight impact on traffic volume and distribution of traffic on the local network. There is anticipated to be increases in traffic flow on local roads to west of the works location, mainly due to traffic routing to avoid the Collins Avenue/Ballymun Road signalised junction. An increase in driver delay in the local area is primarily due to the reduction in capacity on Ballymun Road. This results in a moderate impact in the area, specifically on the approaches to the south and west arm of the Collins Avenue/Ballymun Road signalised junction where delays range between two to four minutes per PCU. This level of impact is prevalent in both the AM and PM peak periods.

During all phases of the Enabling Works, the existing right turn from Ballymun Road to Albert College Court will be banned. This will require vehicles accessing this area to route via Collins Avenue and Albert College Park. While the exact diversion route will vary depending on the vehicles origin/destination, the most direct version is approximately 750m and in a worst-case scenario would result in a journey time increase of 5 minutes during the PM peak period.

During the Collins Avenue Station Main Works construction, the STMP has given a moderate to severe impact on local traffic. The reduction of capacity on Ballymun Road results in a severe impact on traffic volume increases in the area. While traffic in the local area does redistribute primarily to avoid the Collins Avenue/Ballymun Road junction, there are still increases in traffic volume on the junction approach arms. The HGV routing profile for Collins Avenue Station, as well as the site traffic for Griffith Park Station, utilise Ballymun Road and route north to south, and vice-versa, through the junction.

Junction analysis indicates that the Collins Avenue/Ballymun Road junction will operate over capacity during the peak construction year. This will result in increases in driver delay during both peak periods, but specifically high delays of 96 seconds and queues of up 188 PCUs during the AM peak period, along R103 southbound. Delays during the evening peak are the most significant along Glasnevin Avenue and Ballymun Road with delays of 218 seconds and 422 seconds respectively. The detailed results from the junction modelling undertaken is presented in the STMP (Appendix A9.5).

Model outputs indicate there will be an increase in HGV volume of between 1-2% during the peak morning and evening period, along the R108 in both directions, south of the R103. At this section of road, HGVs, including the Project's construction vehicles, account for a 4% share of all traffic.

During both Phase 1 and Phase 2 the closure of the Ballymun Road and Albert College Court junction is necessary due to the construction site footprint. Alternative access for residents in Albert College Grove, Court, Avenue, Court and Lawn, will be provided from the existing Collins Avenue Extension to the north of the site.

Diagram 9.44 illustrates the proposed access to Albert College Park, in which the estate becomes a cul-de-sac. This option removes the potential of 'rat-running' through the area, which may become worse when MetroLink works are in place. However, residents will experience additional delays at Collins Avenue/Ballymun Road junction.

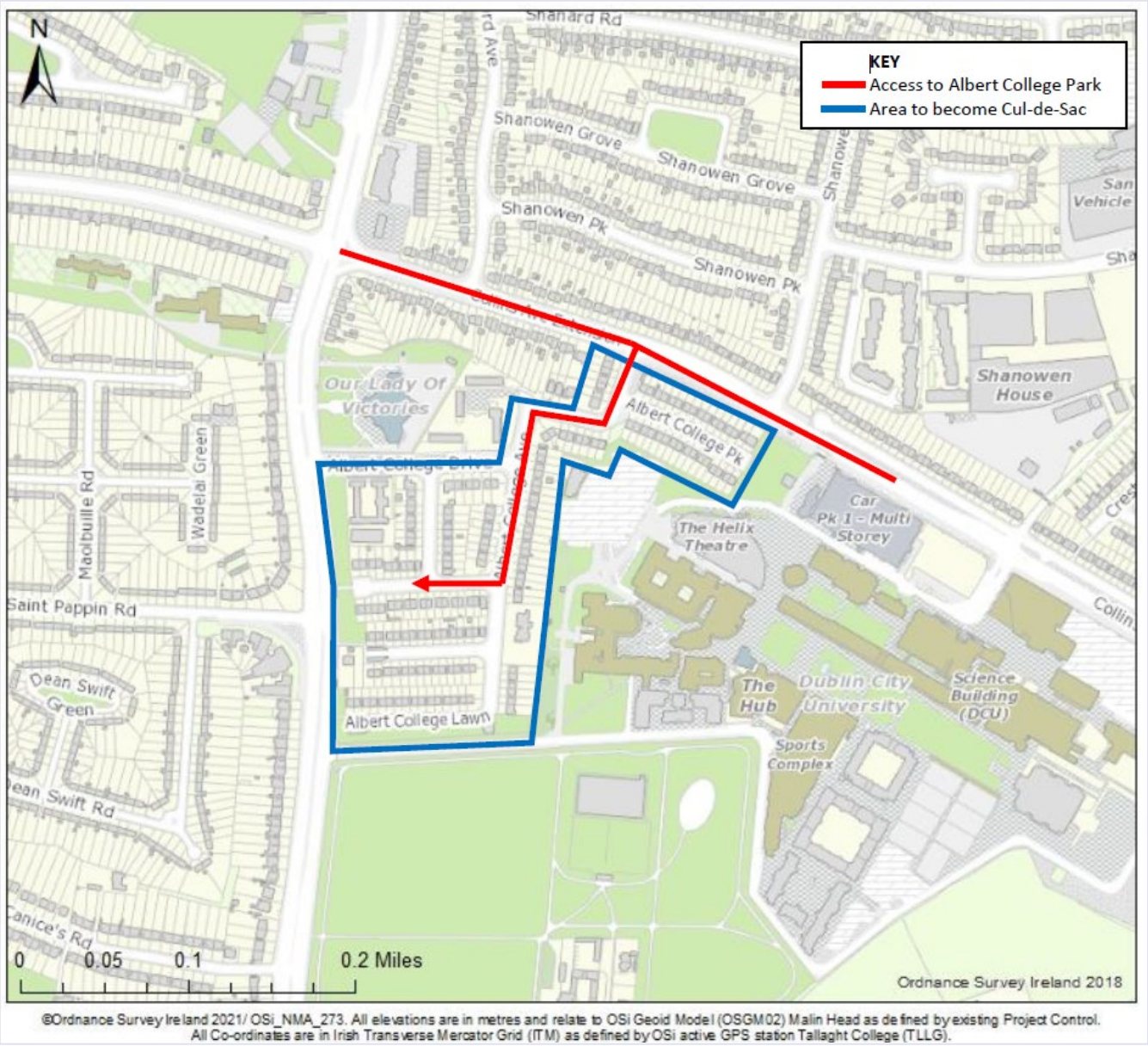

Diagram 9.43: Collins Avenue Local Access Diversions

Griffith Park

Analysis has been undertaken to assess the impact of the traffic management measures on the local road network at Griffith Park Station, which primarily consists of the removal of the southbound bus lane. There will be a slight impact for general traffic and a subsequent slight increase in driver delay. The

removal of the southbound bus lane will cause a traffic flow increase of 5% to 6% along the southbound lanes of R108. The analysis indicates that following the removal of the southbound bus lane there is an increase in driver delay of four seconds during the morning peak flow, and a driver delay increase of one second in the evening peak.

There will be no impactful diversions or road closures that will impact local access in the vicinity of the station area. The works associated with the impact to the Whitehall College of Further Education access will be undertaken at a time which is least impactful to the operation of the school, mainly during evenings and weekends. The TTM design for the shuttle signals allows for continued access to the college during the works.

Increased movements between St Mobhi Road and Whitehall College access road will vary during construction phases, but the construction vehicles numbers are anticipated to have a slight impact on general traffic movements in the local area. The Main Works TTM results in the loss of a bus priority lane with buses expected to utilise the general traffic lane, resulting in a loss of road capacity on the approach to the St Mobhi Road/St Mobhi Drive/Whitehall College access road junction. The removal of the southbound bus lane will cause a traffic flow decrease of 11-13%% along the southbound lanes of R108 during the morning peak. The Main Works TTM at Griffith Park will have no impact on local access and will require no diversions for local movements.

Model outputs indicate that HGV's will have a minimal impact at this station. The area surrounding Griffith Park station will see no change, or a slight decrease in HGV's except along the R108 southbound, until the junction with Home Farm Road, where the increase is 1% in both the morning peak and 6% in the evening peak. At this section of road, HGVs, including the Project construction vehicles, account for a 1% share of all traffic.

Glasnevin

The Enabling Works for Glasnevin Station result in a slight impact for general traffic. Results indicate that the bus lane/general traffic lane removal will result in a slight impact on the section of road where the capacity is decreased, with an increase of volume of 3% in the morning peak and 2% increase during the evening peak.

This increase in volume, primarily due to public transport using the general traffic lane, results in a slight increase in driver delay on Prospect Road, approximately 40 seconds, in the immediate area of the works during the morning peak. During the evening peak, a similar impact is shown in the results, however there is also additional delay on the Prospect Road/Whitworth Road junction, specifically on the southern and eastern approach arms, where the additional delay time is 30 seconds and 21 seconds respectively.

During the Main Works at Glasnevin Station, as the construction site boundary is primarily contained away from the traffic network, there is likely to be a no significant impact on traffic flows throughout the Construction Phase while TTM is implemented. Analysis shows that construction traffic movements will likely result in a minor impact on the nearby signalised junctions and on Prospect Road, however traffic flow will be generally unaffected. There will be some impact on Prospect Road where site vehicles routing from the north to the site will be required to take a right turn into the site, leading to an increase in HGVs in the area.

Model outputs indicate there will be minimal change in HGV volume as in both the morning and evening peaks, the roads immediately surrounding the station, there is little change in the HGV impact.

During all phases of the Main Works, local access to the cottages via Royal Canal Way will be impacted due to the construction footprint. The proposed diversion will be via Leinster Street North or Connaught Street, where traffic will then route north on Shandon Road, utilising the newly built bridge to re-join Royal Canal Way approximately 300 meters west of the existing access. This diversion route is illustrated in Diagram 9.45.

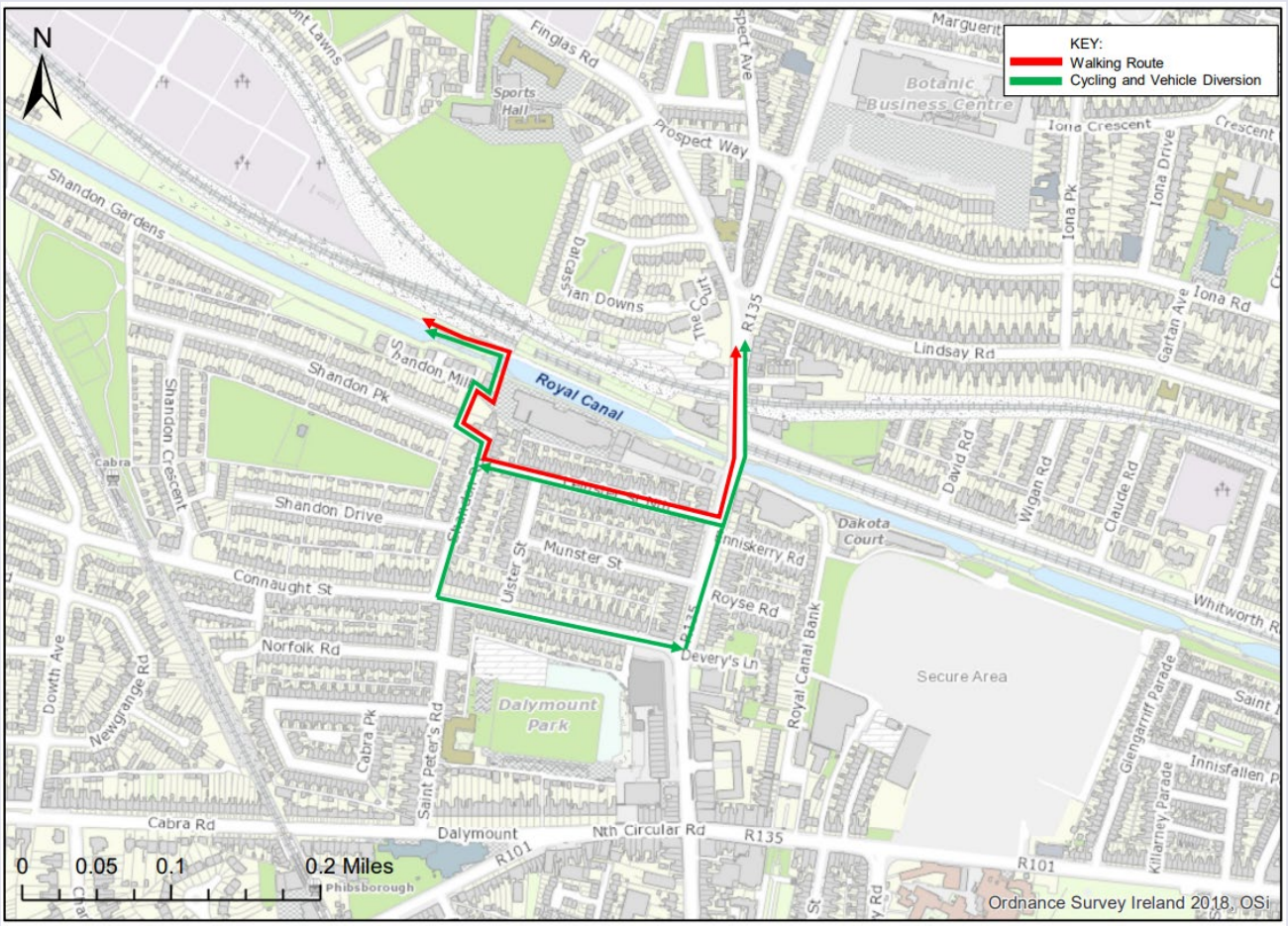

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Diagram 9.44: Glasnevin Station Diversions - Royal Canal Way closure

Mater

During Phases 2.1 to 2.5 of Enabling Works at Mater Station (detailed in the STMP, Appendix A9.5), the introduction of TTM on Berkeley Road will result in a slight to moderate impact on general traffic. The temporary work area in the general traffic lanes requires a set of shuttle signals along Berkeley Road.

The STMP determines that this will result in a moderate impact for general traffic volume, specifically relating to the amount of traffic redistribution caused by the TTM. During both peak period there is a reduction in traffic flow on the R108 this is impact is most severe during the evening peak period where approximately 100 PCUs have diverted away from the northbound and southbound lane on Berkeley Road. This equates to an approximate 40% decrease on the northbound lane and 70% decrease on the southbound lane. The majority of this traffic during the evening peak routes via Eccles Street, which results in up to a 42% increase in volume on the eastbound lane. There is also an increase in volume on the R135 Western Way and on the R101 North Circular Road.

The redistribution of traffic results in only very slight delays in the local area, with a high of 20 seconds increase in delay recorded on Berkeley Road southbound lane during the morning peak period. There will be no diversions impacting on local access in this area.

Phase 1 of the Main Works at Mater Station will maintain all traffic movements on Berkeley Road and on Eccles Street. The reconfiguration of the junction results in slight impacts on traffic volume in the area, with distribution profiles being generally unchanged. There is an increase in driver delay on the Berkeley Road approach to the new priority junction, however this is minimal, totalling to a 11 second increase in the morning peak period, while the additional delay in the evening peak is negligible.

In Phase 2 and 3, general traffic will not be able to access Eccles Street from Berkeley Road. This closure will result in moderate changes in traffic distribution in the local area. During both the morning and evening peak there are small reductions in vehicle flow on Berkeley Road, Eccles Street and some of the surrounding local roads. There are increases in volume along North Circular Road and on the N1 of up to 9%.

The moderate redistribution of traffic results in only slight levels of delay, with all delays in the immediate area of the closures having a negligible impact on traffic time delays during the morning peak period and a maximum delay of 27 seconds during the evening peak.

HGV volume will generally decrease or remain the same in the immediate area surrounding the station during the morning peak. The highest increase (6%) is northbound along Berkeley Road in the morning peak. In the evening peak, HGV volume is less than the morning peak with the highest volume increases recorded at 1%.

In terms of local access, during Phase 1 works no diversions will be in place, however during Phase 2 Eccles Street will be closed to all traffic except Emergency Vehicles. Vehicles seeking to route from Berkeley Road to Eccles Street will now have to divert and approach Eccles Street from the N1 via either North Circular Road or Blessington Street. Vehicles travelling away from Eccles Street will have to divert southbound along Nelson Street and from there can continue to travel along Berkeley Street, Mountjoy Street or Blessington Street. This diversion is approximately 1.3km long. These diversions are illustrated below in Diagram 9.46.

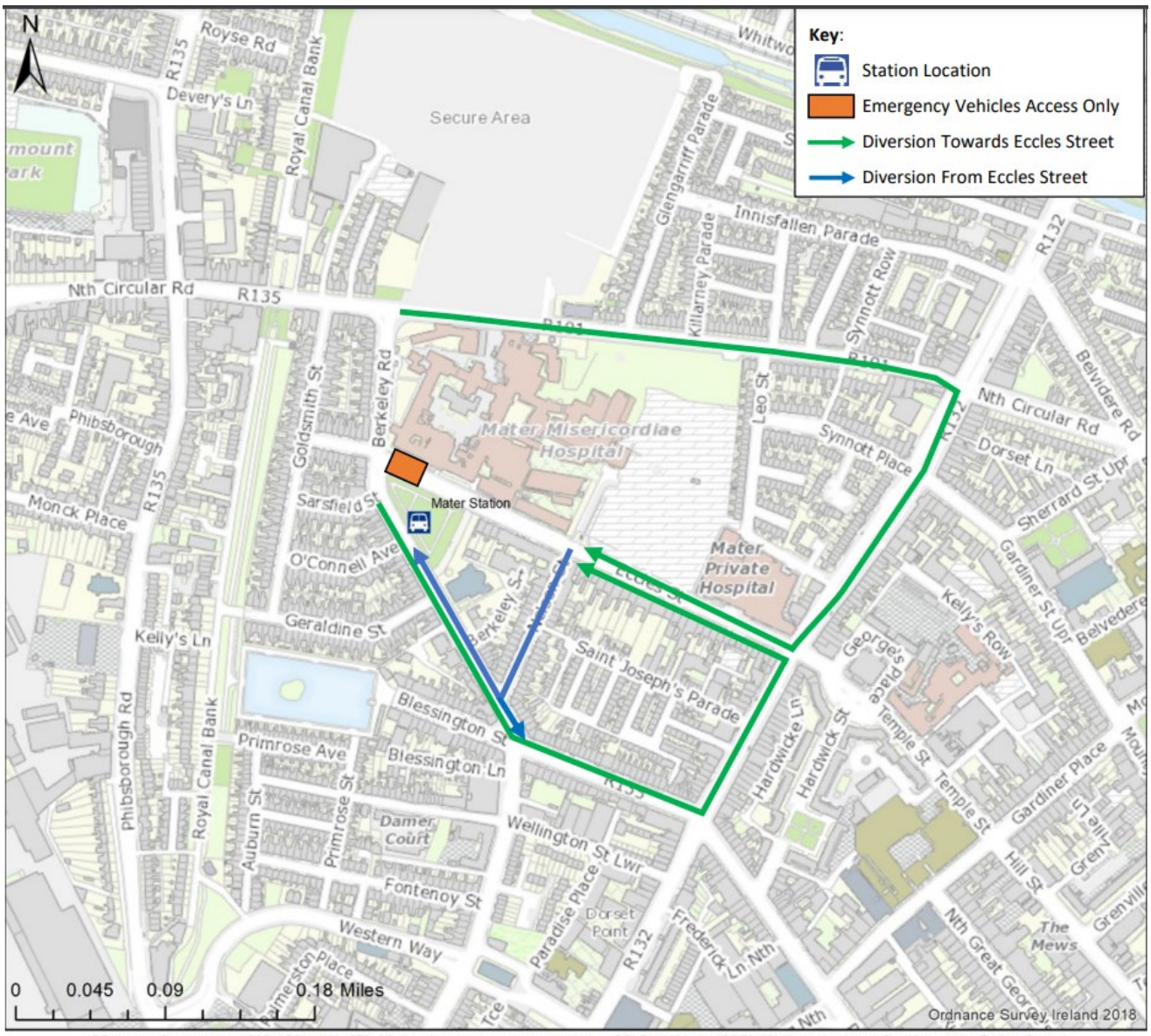

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Diagram 9.45: Mater Station Diversions for Local Access

O'Connell Street

During the morning peak, O'Connell Street Upper will have a decreased traffic flow, 5-6% in both directions. Some of the secondary roads surrounding the location of the O'Connell Street station will experience sight increases in flow including Parnell Street, Mary Street and Henry Street where flow increases are 6%, 15% and 19% respectively. During the evening peak, the most significant changes in traffic flow occur westbound along Henry Street where traffic flow decreases by 100%. Elsewhere during the evening peak, traffic flow remains unchanged.

Traffic delays in the area around O'Connell Street station is negligible, having minimal impact to the surrounding road network.

Model outputs indicate there will be a minor increase in HGV volume during the peak periods, along O'Connell Street Upper northbound, there will be a 2% increase in HGV volume during the morning peak, and a 1% decrease southbound. In the immediate area around O'Connell Street station is 1% with no changes in HGV volume in the immediate area of the station. At this section of road, HGVs, including the Project's construction vehicles, account for a 13% share of all traffic.

Tara Street

During the Enabling Works at Tara Station, model outputs indicate that the lane reduction on Poolbeg Street and Tara Street will have a slight impact on general traffic during the Enabling Works. Drivers will be slightly impacted due to the lane loss on Tara Street leading to a small redistribution of traffic on Tara Street Corn Exchange Place and Tara Street. The redistribution of traffic leads to a negligible increase in delay on surrounding roads.

There will be a slight impact on local access due to the diversion length caused by the partial closure of Luke Street. This will necessitate the diversion of traffic who would typically use the affected streets. Vehicles which would seek to route southbound on Luke Street from the R105 would need to now route down Moss Street (R802), which is parallel to Luke Street to the east. Vehicles seeking to route northbound on Luke Street would be required to use Tara Street (R802) parallel to it in the west.

In the immediate area of the station during the Main Works, flow increases vary from slight to moderate during the Main Works at Tara Station. Model outputs indicate that there will be moderate traffic volume increases during the morning peak period on roads to the east of the site (Moss Street/Shaw Street) and to the south of the site (Pearse Street). This increase is primarily caused by vehicles routing east to west and into the city centre area are diverting away from Luke Street and Poolbeg Street. There are slight to moderate increases in flow in the local area during the PM peak period.

The redistribution of traffic in the local area only has a slight impact on driver delay. The largest recorded additional delay during the analysis is on the D'Olier Street southbound approach to College Street/Townsend Street junction and this delay is 127 seconds in the morning peak. The Construction phase junction analysis results indicates that the junctions in the vicinity of the proposed Tara Station site will be minimally impacted.

Model outputs indicate there will be a large increase in HGV volume of 5-18% during the peak morning period, westbound along the R105. Elsewhere around the station, HGV volumes remain relatively unchanged in the morning peak. During the evening peak, around the station HGV volumes remain the same or decrease except for an 11-13% increase in the eastbound direction of Custom House Quay.

The Main Works will result in the same impact on local access as outlined as part of the Enabling Works.

St Stephen's Green

The reduction in road capacity on St Stephen's Green East during the Enabling Works at St Stephen's Green station, and full closure of Hume Street result in a range of slight to moderate impacts in the local area. The closure of Hume Street is the cause of the majority of re-routing within the local area, where this traffic is primarily onto Merrion Row. The impacts reach a moderate level of impact during the morning peak period, where there is an increase of 12% in traffic volume along Merrion Row. During the evening peak period this impact is less, where the increase is 7%.

The infrastructure changes due to the Enabling Works result in a slight impact in delay. The largest delay recorded in the local area is along St Stephens Green East during the morning peak period, where an increase of 45 seconds is recorded. Model outputs indicate there will be an increase in HGV volume of approximately 3% during the peak morning period, along Merrion Row, between St Stephen's Green and Ely Place. During the evening peak, HGV volume will remain unchanged in the vicinity around St Stephen's Green. At this section of road, HGVs, including Project construction vehicles, account for a 5% share of all traffic.

The Enabling Works at St Stephen's Green station will have a severe impact on diversions and local access due to the closure of Hume Street and subsequent diversion via Pembroke Street and Leeson Street. This diversion is illustrated below in Diagram 9.47.

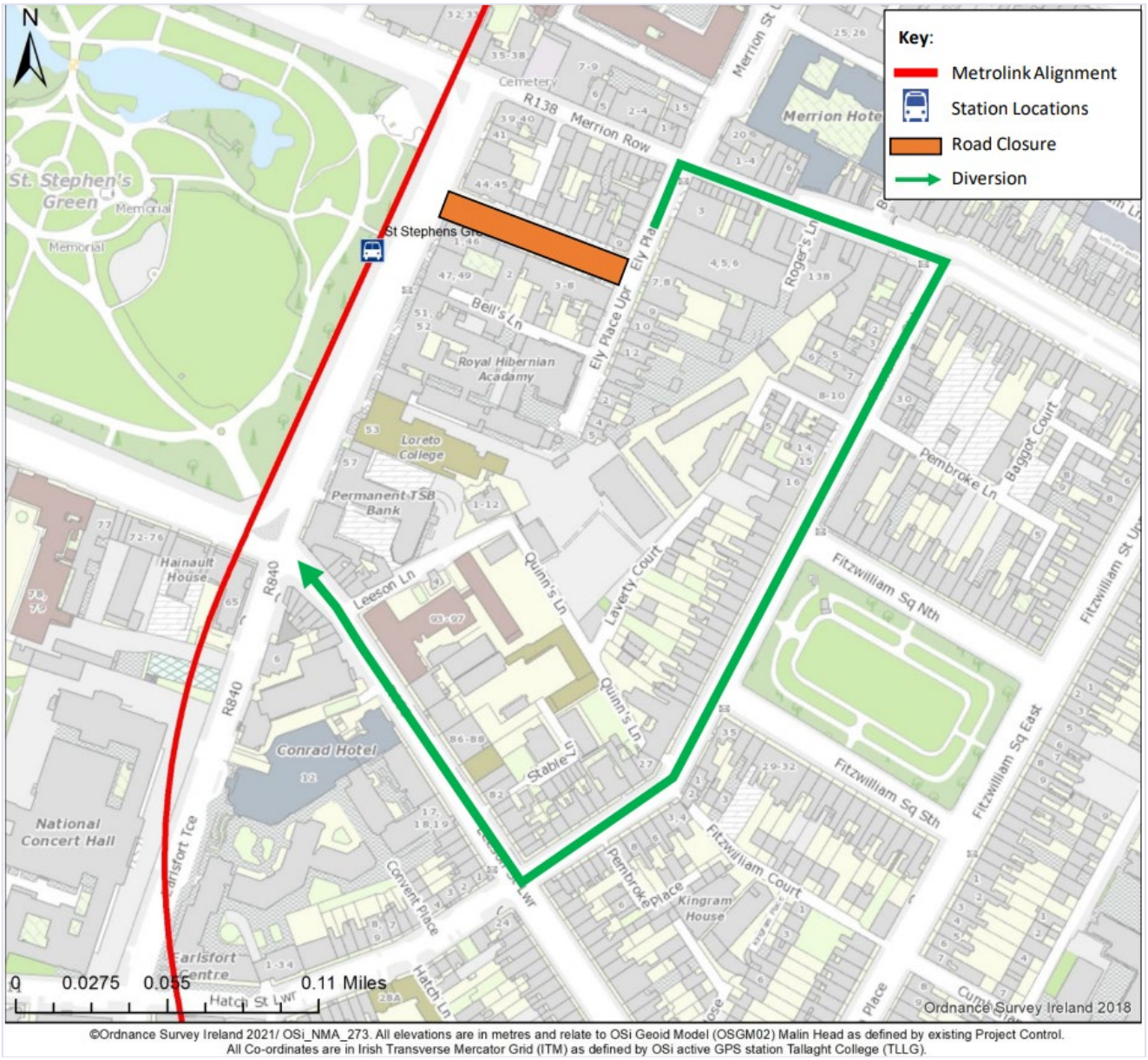

Diagram 9.46: St Stephen's Green Diversion for Local Access

The results of the junction modelling indicate that the main impact of the traffic management measures associated with the Main Works at St Stephen's Green station will occur in the Weekday AM Peak Hour. In this period, a slight amount of queueing will be experienced on the northbound approach to the Hume Street junction due to the lane loss on the R138. During the evening peak, St Stephens Green northbound will experience an increase in traffic flow of 28%.

The redistribution of traffic will only result in slight increases in delay, and this is only present during the morning peak period. This impact is recorded on St Stephens Green East where the delay is 140 seconds.

Model outputs indicate there will be an increase in HGV volume of 2% eastbound along Baggot Street Lower during the morning peak and 1% during the peak evening period. Elsewhere in this area, during both the morning and evening peak periods there is no HGV impact on the surrounding road network. At this section of road, HGVs, including Metrolink construction vehicles, account for a 5% share of all traffic.

Charlemont

The closure of Dartmouth Road throughout the Enabling Works associated with Charlemont Station results in a redistribution of local traffic in the Dartmouth Square area.

The results show both Grand Parade and Northbrook Road having increased volume of traffic during both peak periods. On Grand Parade there is an 8% increase in traffic volume in the eastbound lane during the morning peak and an 11% increase in volume during the PM peak in the westbound lane. A similar volume of additional traffic is shown on Northbrook Road, however due to a lower base volume of vehicles this results in a much more severe proportional increase. There is a 43% (57 PCUs) increase in volume during the morning peak on the westbound lane and a 70% (70 PCUs) increase in the PM peak on the eastbound lane.

The increase in volume on Grand Parade and Northbrook Road does not translate into any significant increase in driver delay. The largest increase in driver delay of 12 seconds is registered on the westbound approach on Grand Parade to Grand Parade/Ranelagh Road signalised junction.

There will be a moderate impact on general traffic around the area of Charlemont station regarding diversions for local access. Existing traffic management on the Northbrook Road/Ranelagh Road priority junction allows for left turns only out of Northbrook Road, which is the minor arm. This results in a longer diversion for the traffic intending to route to the north are being re-routed southbound out of Northbrook Road, turning using local junctions along Ranelagh Road. This increase in the journey length and the requirement for the U-turn for northbound vehicles could be reduced by the removal of the right turn ban at this junction between Ranelagh Road and Northbrook Road. This would reduce the impact assessment as well. This scenario is shown in Diagram 9.48.

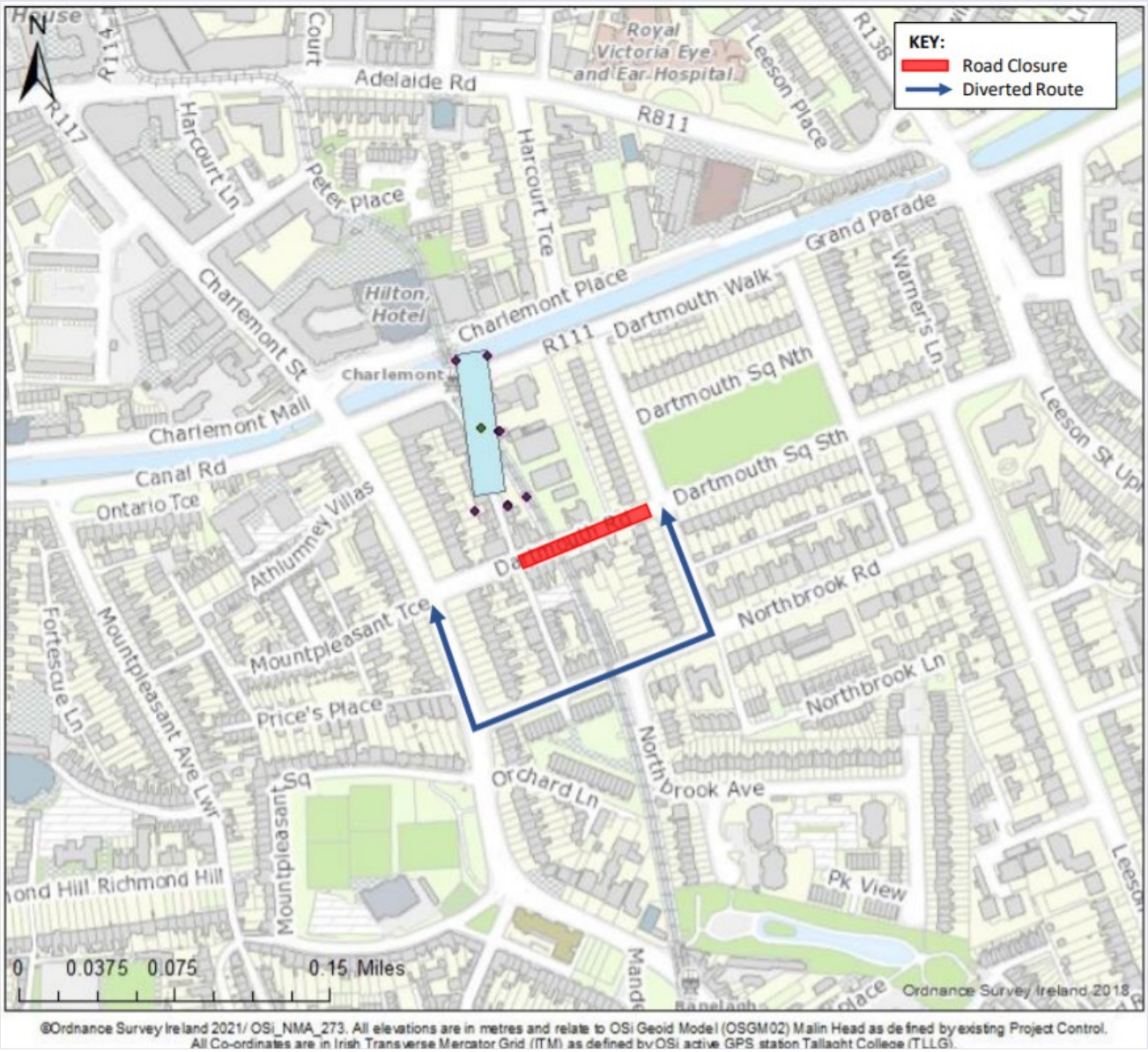

Diagram 9.47: Route Diversions around Dartmouth Road should the no right tun sign be removed.

The temporary signals on Dartmouth Square have not been modelled as part of the assessment but are expected to result in minimal disruption.

The closure of Dartmouth Road throughout the utilities works results in a redistribution of local traffic in the Dartmouth Square area.

In the general area of the station, there will be a decrease in flow, especially along Dartmouth Road in both directions. A decrease of 34 PCUs eastbound and 70 westbound during the AM peak and 159 PCUs eastbound and 26 PCUs westbound during the PM peak. The east section of Northbrook Road experiences a decrease in traffic volume of 8% eastbound and 66% westbound during the AM peak however there is a 58% increase in traffic volume at the Northbrook Road approach to Ranelagh Road. During the PM peak, the eastbound direction of Northbrook Road will have an increase in traffic flows of 386%; an increase of 41 PCUs. Minimal delays occur at the location of Charlemont station, the longest delay occurs eastbound on Dartmouth Road during the AM peak of 14 seconds.

Model outputs indicate there will be a moderate increase in HGV movements during construction. The most significant increase, of just over 2% will be in both directions along Ranelagh Road/Charlemont Street. Elsewhere in the area, increases are significantly lower.

There will be a moderate impact on general traffic around the area of Charlemont station regarding diversions for local access. Existing traffic management on the Northbrook Road/Ranelagh Road priority junction allows for left turns only out of Northbrook Road, which is the minor arm. This results in a longer diversion for the traffic intending to route to the north are being re-routed southbound out of Northbrook Road, turning using local junctions along Ranelagh Road, see Diagram 9.49.

To mitigate the increase in journey length and U-turn needed to route northbound, removal of the right turn ban at this junction would reduce the diversion distance and would result in a slight impact rating.

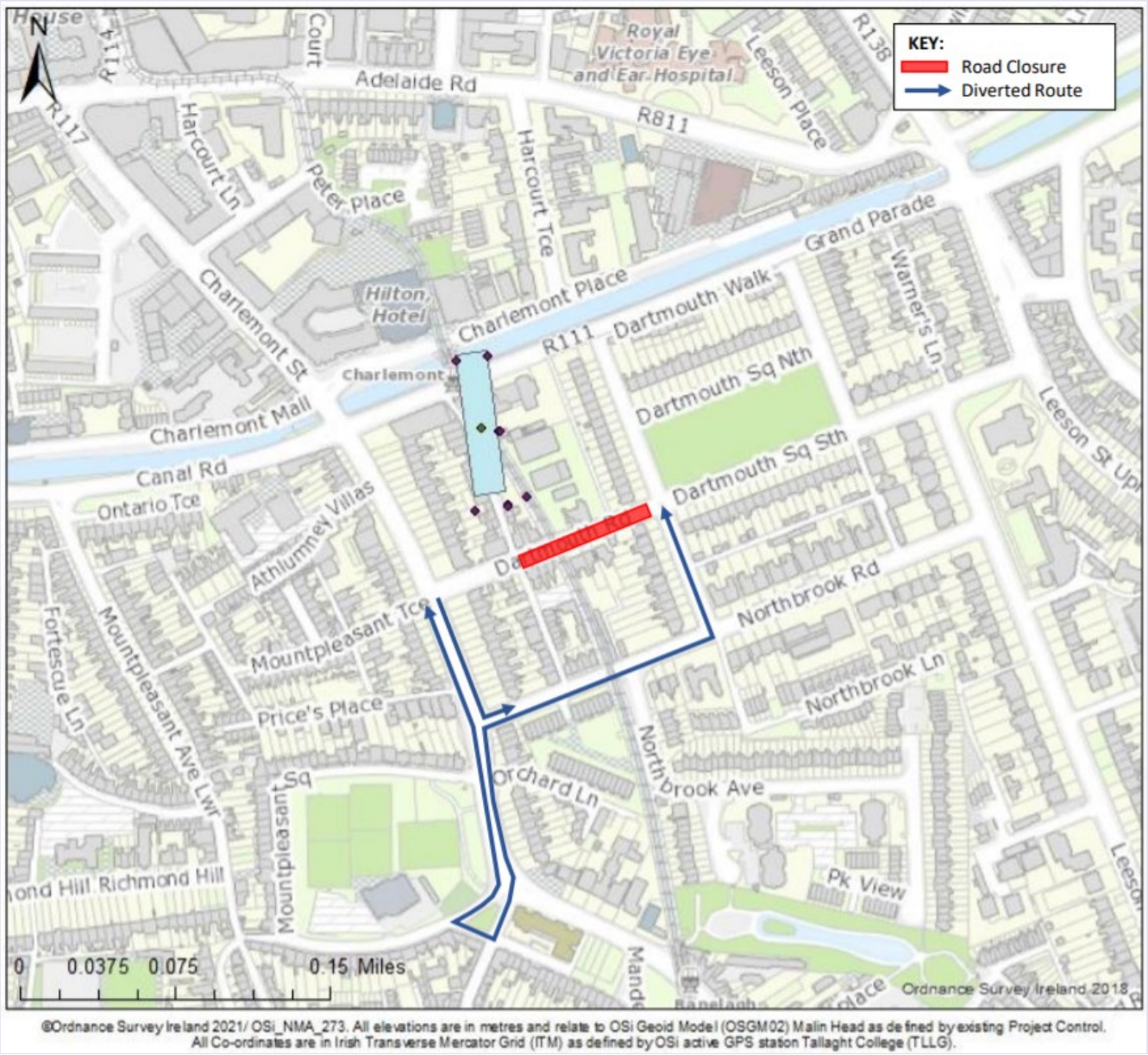

Diagram 9.48: Route diversions around Dartmouth Road should the no right turn sign remain.

9.6.1.2.4.3 Pedestrian Construction Impact Assessment

The STMP details the impacts to pedestrians during this scenario, with a summary of the significance of the impacts presented in Table 9.91.

Table 9.91: Summary of Construction Impact on Pedestrian Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R108 Ballymun Road pedestrian crossing	Relocation of crossing to 40m south	Low- 40m relocation	High – proximity to commercial facilities	Short-term Slight Negative
Albert College Court	Residents will be diverted via new pedestrian footpaths	Low- movements maintained	High- proximity to school	Short-term Slight Negative
R108 St Mobhi Road	Removal of southbound footway and new signalized crossings to north and south of works	Low- movements maintained through provision of crossings	High- proximity to school and Bon Secours Hospital	Short-term Slight Negative
R108 Prospect Road	Phase 1 and 3 Diversions following closure of short section of footway	Low- movements maintained through diversions	High- proximity to heavy rail interchange	Short-term Slight Negative
Eccles Street	Footpath closure for 2-4 weeks. Pedestrian footway diverted along roadside	Low- Movements maintained through diversion	High- Proximity to Mater Hospital Library entrance	Short-term, Slight, Negative
Berkeley Road	Loss of footway width requiring use of footways on opposite side- durations of 3 months	Low-3 month closure however diversions provided	High- Proximity to Mater Hospital	Short-term Slight negative
O'Connell Street (as part of Main Works)	Footway reduced to 1.8m at its narrowest point (west side of O'Connell Street). Existing footway provision on Moore Street/O'Rahilly Parade to be reduced	Medium- movements maintained	High – Dublin City Centre pedestrian demand	Short-term Slight Negative
R802 Tara Street	Partial closure of footway causing diversion for pedestrians	Medium- 2 month closure however diversion provided	High- Dublin City centre pedestrian demand	Short-term Moderate Negative
Poolbeg Street	Partial closure of footway causing diversion for pedestrians	Medium- 2 month closure however diversion provided	High- Dublin City centre pedestrian demand	Short-term Moderate Negative
St Stephen's Green	Close proximity to working areas on Hume Street	Low- movements maintained	High- Dublin City centre pedestrian demand	Short-term Slight Negative
Dartmouth Road	Partial removal of eastbound footway on Dartmouth Road.	Low- no diversion needed but reduction in quality of infrastructure and space	High- Dublin City centre pedestrian demand, proximity to Luas stop	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Main Works				
R108 Ballymun Road Footways	Reduction in footway width on R108 adjacent to site to minimum 2m	Low- minimum 2m in width	High– proximity to commercial facilities	Short-term Slight Negative
R108 Ballymun Road – Collins Avenue Station	Footway realigned in both directions, increased conflict points with site traffic, footway width slightly reduced in sections	Low – movements maintained	High- Proximity to school	Short-term Slight Negative
Albert College Court	Additional pedestrian paths from Albert College Court to R108 Ballymun Road	Medium- Increase in journey time length	High- Proximity to residential areas	Short-term Moderate Negative
R108 St Mobhi Road	Realigned 1.5m footway southbound, increase from 1.3m., and reduced from 1.6m northbound	Low- minimal reductions in width	High- proximity to school and Bon Secours Hospital	Short-term Slight Negative
Royal Canal Way – Pedestrians	Partial closure of Royal Canal Way, however diversion provided and new bridge	High- diversion of over 500m	High- High pedestrian demand at heavy rail interchange	Short-term Significant Negative
Eccles Street/Berkeley Road	Partial removal of footway on Berkeley Road southbound and Eccles Street westbound	Low- Movements maintained through provision of crossings	High- Proximity to Mater Hospital Library entrance	Short-term, Slight, Negative
O'Connell Street	Footway reduced to 1.8m at its narrowest point (west side of O'Connell Street). Existing footway provision on Moore Street/O'Rahilly Parade to be reduced	Low- movements maintained	High – City Centre pedestrian demand	Short-term Slight Negative
Luke Street	Closure of footway for duration of works	High- Full closure for duration of works	High- City Centre pedestrian demand	Short-term Significant Negative
Townsend Street/Tara Street	Footway width reduction on parts of Tara Street and Townsend Street. Protected footways near site and new signalized crossing points added on Tara Street and Poolbeg Street	Medium- Footway reductions however crossing points added	High – City Centre pedestrian demand	Short-term Moderate Negative
Poolbeg Street	Pedestrian route maintained on northern side, additional crossing points	Low- movements maintained and crossings added	High- City Centre pedestrian demand	Short-term Slight Negative
R138 St Stephen's Green East	Closure of the western footway on SSG East. Existing crossings at two locations north and south of the site to facilitate safe crossing	Low- closure of footway but movements maintained with crossings	High- City Centre pedestrian demand	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Dartmouth Road/ Grand Parade	Partial footway closure and new pedestrian crossing on Grand Parade and partial closure of footway on Dartmouth Road. Increased conflict points with site vehicles and moving of crossing point impacting vulnerable users	Low- partial closures and increased conflict points	High- Dublin City centre pedestrian demand, proximity to Luas stop	Short-term Slight Negative

Ballymun

The TTM associated with the Enabling Works at Ballymun Station will result in a slight impact on pedestrians and vulnerable users. This is caused by the works area taking place over the existing pedestrian crossing on the R108. As a result of this, the crossing will be removed from its existing location, with a temporary crossing put in place approximately 40m to the south of it. During the Main Works at Ballymun Station, there will be a small reduction on northbound footway width on Ballymun Road opposite the Civic Centre, which reduces the footway width to a minimum of 2m at its narrowest point. The site entrance and exit both conflict with existing footways which follow along the north and south perimeter of the site. At the site entrance there is new proposed pedestrian crossing which allows for safe crossing point for pedestrians, including vulnerable users.

Collins Avenue

During the Enabling Works at Collins Avenue Station, footways are either retained in their existing location, or realigned to a similar standard. There are no footway, footpath or cycle lane closures that would require users to significantly divert from the existing routing.

During the Main Works at Collins Avenue, pedestrian routes and pedestrian footways on R108 Ballymun Road adjacent to the construction site will be realigned. The southbound carriageway footway will be realigned, while the northbound carriageway footway will remain in its current location. There will be a temporary footpath constructed to the rear of the church in order to maintain access from Albert College Court.

The Enabling Works and Main Works will have impact on students, parents and teachers accessing the Our Lady of Victories Schools, which are located on the west side of the R108, to the north-east of the works areas. For those who walk to the premises, the signalised pedestrian/toucan crossing outside of the front of the school will be retained during all works and will continue to allow safe access for pedestrians and vulnerable users. Cycle lanes will continue to be provided along the R108.

Griffith Park

During the Enabling Works at Griffith Park Station, the footway on the east side of St Mobhi Road will be removed to allow for utilities works, and the footway on the west side will be transformed into a shared space with cyclists. New pedestrian crossings will be added to the area to facilitate the movement of all pedestrians. These changes to the footways will cause an increase in time for those users who cross at a signalised junction, either once or twice.

The new pedestrian signalised crossing to the south of the works will facilitate safe access to the footway access for Whitehall College of Further Education. Pedestrian access to the college will be retained throughout all works.

During the Main Works at Griffith Park Station, pedestrian routes will be maintained along both sides of the road, the provision of the proposed toucan crossing will provide for a new crossing opportunity to one of the existing schools. There will be a slight increase on the footway width on the east side of the road, from 1.3m to 1.5m, while there will be a slight decrease in footway width on the west side footway width, decreasing from 1.6m to 1.5m. The impact on pedestrians will be short-term, Slight and Negative.

The pedestrian access to the Whitehall College will be retained, but the adjacent road is the primary site access route and will have an increased number of HGVs using it. A segregated pedestrian walkway will be provided along the southern side of this access route and delivery times to the proposed Project's construction site will be scheduled to avoid the peak pick-up and drop-off times for the schools in the area.

As part of the traffic management proposals, the toucan crossings will remain operational as part of BusConnects to ensure safe crossing is maintained.

Glasnevin

The Enabling Works at Glasnevin Station will have a slight impact on pedestrians and vulnerable users. During Phase 2 the works will have no impact on infrastructure, however during Phases 1 and 3 there will be a short section footway which will be temporarily closed for pedestrians and vulnerable users. These users will be safely diverted around the worksite, therefore retaining the movements during all phases and resulting in a slight impact for users.

Pedestrians and vulnerable users will also be impacted by the section closure of Royal Canal Way during the Main Works at Glasnevin Station and will be subject to a diversion via Leinster Street North or Connaught Street, where pedestrians will route north on Shandon Road, utilising a newly built budge to rejoin Royal Canal Way, approximately 300m west of existing access. On Prospect Road, adjacent to the site, the western footway will have a small reduction in width where the north-east perimeter of the site will slight cut across the existing footway.

Mater

Footways will be impacted throughout the Enabling Works at Mater Station. During Phase 1 on Eccles Street, pedestrians will be required to use the southern footway at the junction with Berkeley Road as the works will require the full width closure of small section of footway on the north side. Throughout Phase 2, there will be small sections of footway which will require pedestrians and vulnerable users to divert round the temporary work sites. This Phase of works will not require pedestrians to cross the road or seek a diversion.

During all phases of the Main Works at Mater Station, there will be significant loss of footway on the east of Berkeley Road and the south of Eccles Street, adjacent to the indicative construction zone boundary. Due to the site footprint immediately south of the Berkeley Road and Eccles Street encroaching over the entire footway, pedestrians will be required to use the footway either to the west Berkeley Road or north of Eccles Street. Appropriate signage and crossing facilities will be put in place.

O'Connell Street

At O'Connell Street, all Enabling Works will take places within the site boundary of the Main Works and will thus be subject to the same impacts. The site extent towards the eastern perimeter encroaches upon the footway on O'Connell Street, reducing the footway width to 1.8m at its narrowest point. This will result in a moderate impact for pedestrians and vulnerable users due to the high volume of footway users in this area.

The footway on Parnell Street will not be impacted during the works associated with O'Connell Street Station, however there may be potential conflict with site vehicles and pedestrians/cyclists at the Parnell Street junctions. The Parnell Street junctions with Moore Lane and Moore Street have large volumes of pedestrian traffic, and both crossings are currently uncontrolled. Therefore, banksmen may

be employed here to manage pedestrian movements while construction vehicles are leaving. Alternatively, the minor arm could be signalised to permit safer pedestrian movements.

Tara Street

During the Enabling Works associated with Tara Station, there is expected to be a moderate impact on pedestrians. During all phases of the Enabling Works, some of the footways along Tara Street and Poolbeg Street will be partially closed due to the utilities work occurring adjacent to the footways. During Phases 1 and 2, the footway on the east side of Tara Street will be partially closed for a period of two to eight weeks and pedestrians will have to cross at the nearby signalised junction and use the footway on the other side of Tara Street. The diversion will require pedestrians to use the footway on the west side of the street, crossing at the signalised junctions at Poolbeg Street and Townsend Street. During Phases 4, 5 and 6 of the Enabling Works at Tara Street small sections of the footway on Poolbeg Street will be closed, requiring pedestrians to use the other side of the road.

The footways on Luke Street would be closed throughout the duration of the Main Works at Tara Station. There will also be a loss of footway width on Townsend Street, adjacent to the southwest perimeter of the site boundary and on Tara Street, adjacent to the west perimeter of the site. Poolbeg Street will maintain a pedestrian route on the northern side. Access will be maintained to Tara Station for passengers throughout the works.

St Stephen's Green

During the Enabling Works at St Stephen's Green Station, there is expected to be a slight impact on pedestrians. During all phases of the Enabling Works, footways are reduced to allow for utility works. Pedestrians may have to divert their routes slightly in line with the construction phase however, the work will not cause vulnerable users to divert significantly from the existing route.

During the Main Works associated with St Stephen's Green, the footway adjacent to the eastern periphery of the site on St Stephen's Green East (R138) will be closed. To mitigate this, relevant signage at the signalised crossings to the north and south of the closure will need to be applied, advising pedestrians to use the footway on the opposite side of the road. In addition, a temporary pedestrian crossing is proposed to be provided on the east arm of the St Stephens Green/Merrion Row junction.

Charlemont

For pedestrians during the Enabling Works at Charlemont Station, the north side of Dartmouth Road footway will be closed however, the southbound footway will be retained throughout all Enabling Works stages. While this will result in no diversions for pedestrians, there will be a reduction in quality of pedestrian infrastructure and space.

During the Main Works at Charlemont Station, the construction site boundary will encroach upon footways in the local area; at its northern extent, the site footprint encompasses the footway on the southern side of Grand Parade. At the northern extent of the site the footways will be retained on both sides of the road. There will also be a temporary signalised crossing to west of the Luas, to facilitate access to/from the Luas. At its southern extent, the site footprint will result in the closure of Dartmouth Road and the northern side footway.

The significant impacts are a residual impact of the proposed TTM measures; however, they will be removed once the Construction Phase is complete.

9.6.1.2.4.4 Cycle Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to cyclists during this scenario, with a summary of the significance of the impacts presented in Table 9.92.

Table 9.92: Summary of Construction Impact on Cycle Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R108 Ballymun Road-Ballymun Station	Existing levels of infrastructure maintained	Negligible- no diversions required or loss of infrastructure	High- Secondary Route	Short-term Imperceptible Negative
R108 Ballymun Road-Collins Avenue	Realigned carriageway with 1.5m cycle lane in both directions, increased conflict point with HGVs and removal of right turn from R108 to Albert College Court	Low- movements maintained, mitigation to minimize risk of conflicts	High- Secondary Route	Short-term Slight Negative
R108 St Mobhi Road Southbound Cycle Lane	Northbound cycle lane only and southbound cyclists required to use general traffic lane	Medium- increased conflict with general traffic	High- Secondary Route	Short-term Moderate Negative
R108 Prospect Road	Bus lane removed on Prospect Road northbound	Low- increased conflict with general traffic	High- Secondary Route	Short-term Slight Negative
Mater- Phase 1	Removal of Dublin Bikes during phase 1	Medium- diversions in place on general traffic lane	High- Secondary Route	Short-term Moderate Negative
O'Connell Street	No cycle facilities in the local area impacted by TTM	Negligible- no diversions required or loss of infrastructure	High- Primary Route	Short-term Imperceptible Negative
Luke Street	Road closure along Luke Street between Townsend Street and Poolbeg Street	Medium- movements maintained however diversion required	High- No designation but Dublin City Centre location	Short-term Moderate Negative
R138 St Stephen's Green East Cycle Lane	Diversion of cycle lane	Low- movements maintained	High- Primary Route	Short-term Slight Negative
Dartmouth Road	Closure will cause diversions for cyclists via Northbrook Road	Medium- moderate diversion required	High- Connects to Primary Network and Feeder Network	Short-term Moderate Negative
Main Works				
R108 Ballymun Road-Ballymun Station	Existing levels of infrastructure maintained	Negligible- no diversions required or loss of infrastructure	High- Secondary Route	Short-term Imperceptible Negative
R108 Ballymun Road-Collins Avenue	Realigned carriageway with 1.5m cycle lane in both directions, and removal of R108/Albert College Court Junction	Low- movements maintained,	High- Secondary Route	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
R108 St Mobhi Road Cycle Lanes	Redesigned carriageway with 1.5m cycle lane southbound and segregated 1.4m cycle lane northbound	Low- movements maintained and safe crossing points	High- Secondary Route	Short-term Slight Negative
Royal Canal Way	Full section closure of Royal Canal Way. Mitigation of bridge construction and diversion	Moderate- Residual Impact and further mitigation required	High- Feeder Route	Short-term Moderate Negative
Berkeley Road	Partial removal of northbound and southbound cycle lanes on Berkeley Road. Shared cycle/car spaces on Eccles Street and Nelson Street	Low- existing movements maintained in all phases on Berkeley Road and Eccles Street	High-no designation but connects to Primary Network	Short-term Slight Negative
O'Connell Street	No cycle facilities in the local area impacted by TTM	Negligible- no diversions required or loss of infrastructure	High- Primary Route	Short-term Imperceptible Negative
Luke Street	Road closure along Luke Street between Townsend Street and Poolbeg Street	Medium- movements maintained however diversion required	High- No designation but Dublin City Centre location	Short-term Moderate Negative
R138 St Stephen's Green East	Cycle lane retained and realigned full northbound and partially southbound. Removal of DublinBikes Station	Medium- movements maintained, shared infrastructure removed	High- Primary Route	Short-term Moderate Negative
Dartmouth Road	Partial closure will cause diversions for cyclists via Northbrook Road	Medium- moderate diversion required	High- Connects to Primary Network and Feeder Network	Short-term Moderate Negative
R111 Grand Parade	Realignment of cycle lanes causing increased conflict points with site access vehicles	Medium- Increase conflict with general traffic lane	High- Secondary Route	Short-term Moderate Negative

Ballymun

During both the Enabling Works and Main Works at Ballymun Station, there will be a negligible impact on cyclists as a result of the TTM. The existing level of cycling infrastructure and movements available for cyclists is retained throughout the duration of the station construction phase.

Collins Avenue

During the Enabling Works at Collins Avenue, there is expected to be a slight impact on cyclists. During all phases of the Enabling Works, cycle lanes are included as part of the TTM during all phases, in both directions. Due to the site entrance and exit locations, with site vehicles, including HGVs, undertaking right and left turns, there is an increase in risk to the safety of cyclists at these conflict points. However,

control measures will minimise these safety risks through the use of visibility mirrors and banksmen. During the Main Works, dedicated cycle lanes on R108 Ballymun Road will be maintained on both sides of the carriageway throughout the duration of the works.

Griffith Park

During the Enabling Works associated with Griffith Park Station, there will be a moderate level of disruption caused to cyclists in the area. The existing infrastructure includes a northbound contra-flow off-road cycle lane on the east side of the road, while the cyclists southbound use the existing bus lane. The cycle lanes here will be changed during both phases of the TTM. The northbound cycle lane will be removed entirely as well as the southbound bus lane, which is used by southbound cyclists. The west side of the road will be transformed into a shared footway and cycle path with a minimum width of 2.3m and a proposed toucan crossing to the north of the works will allow for a safe crossing. Where cyclists may not wish to use this infrastructure for this short section, cyclists will have to share the general traffic lane (with general traffic and buses) which will have no segregated infrastructure.

As part of the traffic management proposals for the Main Works at Griffith Park Station, both northbound and southbound cyclists will remain operational as part of BusConnects, along with toucan crossings which will provide safe crossings points. A slight impact is recorded for cyclists due to the proximity of the cycle lane to the general traffic lane.

Glasnevin

Cyclists will be impacted slightly due to the Enabling Works at Glasnevin Station. The existing road layout allows cyclists to utilise the bus lane on this section of Prospect Road. With the removal of the bus lane during the works, cyclists will have to use the general traffic lane, resulting in a drop in safety standards for cyclists.

During the Main Works, cycle facilities are currently on-road at this section of Prospect Road, where cyclists have the ability to use the bus lane infrastructure. Cyclists using this designated primary cycle route will not be impact by the proposed works. However, the Main Works at this station will require a full section closure on Royal Canal Way, which is a dedicated Greenway in the GDA Cycle Network Plan. The full closure will require further mitigation to provide access to the Royal Canal Way. The proposed mitigation will be to construct a bridge over the canal, re-establishing the link for cyclists. The proposed diversion will be via Leinster Street North or Connaught Street, where traffic will then route north on Shandon Road, utilising the newly built bridge to re-join Royal Canal Way approximately 300 meters west of the existing access.

Mater

During the Enabling Works at Mater Station, there is expected to be a slight impact on cyclists in the area close to Mater station. The impact is specifically for cyclists as the cycle lane will be interrupted for a period making it unusable and cyclists must divert their flow of travel around the road works into the general traffic lane. During Phase 1 Enabling Works, the DublinBikes stand will be removed from Eccles Street for a duration of one to three months.

During Phase 1 Main Works, the reconfigured Berkeley Road and Eccles Street junction will retain all movements for cyclists. However, the removal of the southbound cycle lane on Berkeley Street will be removed to accommodate the construction site and cyclists will be diverted to use the new shared route along Eccles Street and Nelson Street. In Phase 2 and 3 a cycle lane will be retained at the Eccles Street closure, retaining the movement between Berkeley Street and Eccles Street. The southbound cycle lane on Berkeley Street will be removed to accommodate the construction site and cyclists will be diverted to use the new shared route along Eccles Street and Nelson Street. The cycle lane on the northbound section of Berkeley Road is retained.

O'Connell Street

The Enabling Works and Main Works at O'Connell Street Station will have a negligible impact on cyclists as a result of the proposed TTM. There may be potential conflict with site vehicles at Parnell Street junctions however banksmen will be employed here to manage movements while construction vehicles are leaving.

Tara Street

There is limited cycling infrastructure on Luke Street, Poolbeg Street and Tara Street and therefor the impact of the Enabling Works and Main Works associated with Tara Station on cycling infrastructure is negligible. There is a moderate impact recorded against journey length impact, caused by the partial closure on Luke Street and the length of the resulting diversion. There is a slight impact on safety where on-street cyclists have the potential to interact with turning site vehicles on Townsend Street and Tara Street.

St Stephen's Green

During the Enabling Works at St Stephen's Green, there is expected to be a slight impact on cyclists. During all phases of Enabling Works, cycle lanes are diverted to allow for utility works. Cyclists may have to divert their routes slightly in line with the construction phase however, the work will not cause vulnerable users to divert significantly from the existing route.

During the Main Works, on-road cycle lanes will be provided for both the southbound and the northbound cyclists, these cycle lanes will have a width of between 1.5m to 1.8m.

Charlemont

During the Enabling Works and Main Works associated with Charlemont Station, the closure of Dartmouth Road will moderately affect cyclists as the footpath will not provide enough space to allow safe cycling. This will require cyclists to divert via Dartmouth Terrace and Northbrook Road. Alternatively, cyclists can route via Dartmouth Square West and Grand Parade, where they would be required to dismount at the steps at north of Dartmouth Square West.

As part of the Main Works on Grand Parade, the on-road cycle lane on the westbound lane will be removed and cyclists will be required to the use the general traffic lane. The on-road cycle lane on the eastbound lane will be retained.

9.6.1.2.4.5 Parking and Loading Construction Impact Assessment

The STMP (Appendix A9.5) details the impacts to parking during this scenario, with a summary of the significance of the impacts presented in Table 9.93.

Table 9.93: Summary of Construction Impact on Parking Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Enabling Works				
R108 Ballymun Road- Collins Avenue Station	Restricted bus lane parking during works	Low – loss of undesignated parking	High – proximity to school	Short-term Slight Negative
Berkeley Road	Removal of 7 parking spaces at any one time. Temporary removal of loading bays, facilities relocated nearby to	Low- loading bays relocated and max. 7 spaces lost	High- Mix of commercial and residential on-street parking	Short-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
	south of current location			
O'Connell Street/Moore Lane	Creating one-way arrangement for HGV traffic using Moore LIDL store	Low- movements maintained	High- Dublin City Centre retail core	Short-term Slight Negative
Luke Street	Closure along Luke Street between Townsend Street and Poolbeg Street. Removal of loading bay on Tara Street and Townsend Street	Medium -Same diversions required as general traffic	Medium- HGV management strategy in place so minimal HGVs impacted, however Dublin City Centre location	Short-term Moderate Negative Impact
Hume Street	Removal of 15 spaces (out of available 33 spaces)	High- almost 50% of available spaces lost	Medium- Dublin City Centre Retail core however ample parking available in the centre	Short-term Moderate Negative
Dartmouth Road	Loss of approx. 30 spaces	Medium- 30 residential spaces	High – Residential Parking and in proximity to Luas stop	Short-term Slight Negative
Main Works				
Silloge Road	Loss of ~ 5 spaces	Low- minimal loss of on street spaces	Medium- on-street public parking	Short-term Slight Negative
Albert College Court	Commercial vehicles access church car park will be required to use diversion via Albert College Court	Low- Movements maintained	Low – Minimal commercial loading demand	Short-term Slight Negative
Albert College	Loss of 42 spaces (42% of public parking within 200m)	Very High- % of available parking in area	Medium- not residential permit parking so does not impact residents	Short-term Significant Negative
Berkeley Road	12 Pay and Display parking spaces will be removed, removal of 5 resident permit parking	Medium- 17 spaces lost	High- Mix of commercial and residential on-street parking	Short-term Moderate Negative
Berkeley Road	2 Loading bays will be relocated	Medium- relocated nearby	Medium-commercial loading demand	Short-term Moderate Negative
Eccles Street	20 parking spaces removed taxi bays removed and relocation of taxi rank	High- Most of available parking on Eccles Street	Medium- Proximity to Mater Hospital	Short-term Moderate Negative
O'Connell Street/Moore Lane	Creating one-way arrangement for HGV traffic using Moore LIDL store	Low- movements maintained	High- Dublin City Centre retail core	Short-term Slight Negative
Poolbeg Street	Relocation of bus stop on Poolbeg	Low- Small loss of	Low- Minimal available parking	Short-term Slight

Link	Description	Magnitude	Sensitivity	Significance of Impact
	Street. Small loss of parking associated with relocation of bus stop on Poolbeg Street	parking	Dublin City Centre	Negative Impact
Luke Street	Closure along Luke Street between Townsend Street and Poolbeg Street. Removal of loading bay on Tara Street and Townsend Street	Medium -Same diversions required as general traffic	Medium- HGV management strategy in place so minimal HGVs impacted, however Dublin City Centre location	Short-term Moderate Negative Impact
Hume Street	Removal of 15 spaces (out of available 33 spaces)	High- almost 50% of available spaces lost	Medium- Dublin City Centre Retail core but ample parking available elsewhere in centre	Short-term Moderate Negative
Dartmouth Road	Loss of approx. 30 spaces	Low- 30 residential spaces	High – Residential Parking and in proximity to Luas stop	Short-term Slight Negative

Ballymun

At Ballymun Station, there will be a negligible impact on commercial/retail loading or parking during the Enabling Works. During the Main Works, the proposed TTM will have a negligible impact loading facilities and have a slight impact on parking. There will be a slight loss of public/residential parking near to the construction site. Approximately five to six spaces will be lost at the parking bays on Silloge Road, due to the site exit location.

Collins Avenue

During the Enabling Works associated with Collins Avenue, Phase 1 to 5 of the works will require the suspension of parking on the bus lanes. There will be a slight impact on retail loading during the Main Works, where commercial vehicles accessing the church car park will be required to use the diversion via Albert College court. Existing parking spaces on Albert College Drive will be removed as part of station construction. This will result in the removal of 42 spaces on this street, which equates to 42% of public parking spaces within a 200m area. The parking at this location is not residential permit parking and removal of the parking will not directly impact on residential parking in the area.

Due to the constrained lane capacity during the works, and the relocation of bus stops, temporary parking on the R108 as part of a 'drop-off' will be restricted.

Griffith Park and Glasnevin

The Enabling Works and Main Works at Griffith Park Station and Glasnevin Station will have a negligible impact on commercial or retail loading, or parking in the surrounding areas.

Mater

There are slight impacts for loading and parking during the Enabling Works associated with Mater Station. These are in the form of a loss of parking bays for both on street loading facilities and for general parking loss. This loss of parking is during Phases 2.1, 2.5 and 6. Approximately seven parking spaces

during the most impactful sub-phase however generally, only one or two spaces will be lost during each sub-phase.

During Phase 1 of the Main Works, the Pay and Display parking spaces along the eastern side of Berkeley Road will be removed, resulting in the removal of 12 on-street parking spaces. Approximately five on-street Pay and Display and Resident Permit parking spaces will be removed from the western side of Berkeley Road. On Eccles Street, there will be approximately 20 parking bays removed and the taxi rank will be removed. A temporary location for the taxi rank will need to be agreed with DCC.

During Phase 2 and 3 of the Main Works at Mater Station, the Pay and Display parking spaces along the eastern side of Berkeley Road will be removed. This will result in the removal of 12 on-street parking space. On the west side of Berkeley Road, five on-street Pay and Display and Resident Permit parking spaces will be removed as well as a loading bay that will be relocated. On Eccles Street, there will be approximately 20 parking bays removed.

O'Connell Street

No on-street parking or on street loading bays will be removed as part of the traffic management works at O'Connell Street Station. There is a loading dock for the LIDL store located on the west side of Moore Lane. Auto-tracking analysis has been undertaken and HGV traffic can reverse into the loading bay from Moore Lane with the new one-way arrangement in place.

Tara Street

The closure on Luke Street will require a diversion for all vehicles intending on utilising Luke Street as part of their journey during the Enabling Works at Tara Station. Commercial vehicles will be subject to the same diversions outlined for general traffic, however and HGVs will need to take cognisance of the City Centre HGV Management Strategy. During all phases of works the loading bay on Tara Street and Townsend Street will be removed, resulting in a moderate impact in the STMP assessment.

The loading bay on Tara Street immediately opposite the south-west boundary of the construction site will be removed for the duration of the Main Works. The loading bay on Townsend Street, located on the southern side of the road close to the railway overbridge will also need to be removed. Alternative locations for loading bays for this location may be provided by DCC during the Construction Phase, this requirement will be noted to DCC.

A proposed hotel is currently under development on the corner site to the north of the Tara Station. The proposed hotel had suggested the provision of a loading bay on Poolbeg Street, this loading bay will not be accessible during the construction of the Tara Station. Access to the hotel for deliveries and for general traffic will be via Tara Street and delivery traffic can either use the access gate to the car lift to do a turn around and drive out of Poolbeg Street or reverse back on Tara Street under the supervisor of a banksman. No on-street parking will be removed as part of the construction phase for the Tara Station.

St Stephen's Green

There will be a slight impact on loading and parking during the Enabling Works at St Stephen's Green for public/residential parking. Approximately 15 of the 33 available pay and display parking spaces available along Hume Street will be unavailable during the Enabling Works at St Stephen's Green. This is the only impact on loading and parking for this station.

During the Main Works at St Stephen's Green the 40 Dublin Bike stands on St Stephens Green East will be removed and the 15 on street Pay and Display parking spaces on the same street will also need to be removed. This will cause a severe impact on parking in the local area around St Stephen's Green for residents and the general public as there only are 33 pay and display spaces along Hume Street, however given the city centre location there are numerous alternatives on-street parking and off-street parking locations within the area therefore no mitigation is proposed for this impact.

Charlemont

During the Enabling Works at Charlemont Station, there is expected to be no impact on commercial/retail loading and no loss of commercial parking. However, there will be a moderate impact on public/residential parking loss along Dartmouth Road and Dartmouth Square. Dartmouth Road will lose approximately 30 spaces during Phase 2 and 3 while Dartmouth Square West will lose between 8 to 10 at a time during Phase 4.

The existing on-street parking on the closed section of Dartmouth Road will not be available during the Main Works at Charlemont Station, causing a moderate impact here for public and residential parking. Approximately 30 on street parking spaces will be lost during the main works construction along Dartmouth Road to the junction with Ranelagh Road. There will be no impact on on-street loading bays.

9.6.1.3 Construction Phase Summary

The STMP (Appendix A9.5) provides a summary of the magnitude of the impact of the proposed Project's Construction Phase on each of the user groups (public transport, general traffic, vulnerable users, parking and loading). Detailed descriptions of the works at each site and the associated HGV routing or each routing are also presented in the STMP, with further details found in Chapter 5 (MetroLink Construction Phase). The STMP assessment is based on the current MetroLink Project Design Report and TTM designs/layouts, as well as estimates of when the Construction Phase will commence, and the timescales/durations of same. The assessment uses 2028 as the most impactful construction year, in terms of construction vehicle numbers.

Table 9.94 presents a summary of all Significant impacts identified in both the Enabling Works and Main Works of the Project's Construction Phase. The short-term, Significant, negative impacts during the Construction Phase are residual impacts of the proposed TTM measures, which act as mitigation throughout the Construction Phase, and as such, they will be removed once the Construction Phase is complete. Therefore, further mitigation measures are not required, and will not be identified in section 9.7 Mitigation Measures.

As demonstrated, many of the Significant impacts occur within the AZ1 Northern section, particularly within the Main Works of the Construction Phase. This section predominantly consists of the Regional Road Network, increasing the sensitivity and significance of the impact. Arm and lane closures at the junctions along the R132 Swords Bypass such as the R125 Airside Retail Park arm of Pinnock Hill Junction will increase traffic volumes on the R132 southbound by 74%. There will be no Significant negative impacts to users within the AZ2 Airport Section in either the Enabling Works or Main Works. In AZ3 Dardistown Depot to Northwood Section, there will be a Significant increase in the volume of HGVs utilising the R108 as this is the primary route to and from Huntstown Quarry. In AZ4 Northwood to Charlemont Section, there will be Significant impacts on the public transport network due to the closure of the Western Commuter Line and Southwestern Commuter Line. These impacts are both long in duration, and occur on highly significant public transport systems, and as a result cause face Significant negative impacts from the Project. There will be increases in traffic flow of 17% on Berkeley Road as a result of the restricted access to Eccles Street during the construction of Mater Station, as well as closures of key pedestrian and cycle route around Glasnevin and Tara stations.

Table 9.94: Summary of Significant Impacts identified during the Construction Phase

Section	Link	User Group	Impact	Description
Enabling Works				
AZ1 Northern Section	Seatown Junction	Parking and Loading	Short-term Significant Negative	Diversion of access of approx 2.5km to 3.5km and loss of 30% of spaces at Woodies
AZ3 Dardistown Depot to	R108 Ballymun Road (Northwood)	General Traffic	Short-term Significant Negative	HGV routeing profile takes several stations worth of site vehicles through this area

Section	Link	User Group	Impact	Description
Northwood Section	R108 Ballymun Road Realignment-	Cyclists	Short-term Significant Negative	Removal of southbound cycle facility during phase 3. Cycle lane/ways provided in other phases. cycle facility not replaced in Phase 3, requirement to use traffic lane
AZ4 Northwood to Charlemont Section	Poolbeg Street	Pedestrians	Short-term Significant Negative	2-month Closure of footway causing diversion for pedestrians
	Hume Street – Local Access	General Traffic	Short-term Significant Negative	Closure of Hume Street and 900m diversion via Pembroke Street and Leeson Street
Main Works				
AZ1 Northern Section	Estuary Junction	General Traffic	Short-term Significant Negative	Loss of turning movements to and from the R125 (west) junction arm
	Ennis Lane	General Traffic	Short-term Significant Negative	Closure of Ennis Lane, which links the R132 to Balheary Road
	Seatown Junction and Station	General Traffic	Short-term Significant Negative	Reduced capacity on all arms of Seatown Junction including the loss of turning movements to and from Seatown Road (East) junction arm. Restriction of movements causes 1-2km diversion for local access
	R125 Airside Retail Park	General Traffic	Short-term Significant Negative	Full closures of the R125 south arm during Main Work. Reduced general traffic lane on R132 southbound on approach to junction and R132 northbound on approach to junction. Results in 81% increase in traffic volume on R132 southbound between Pinnock Hill Junction and Nevinstown Junction
	Nevinstown Junction	General Traffic	Short-term Significant Negative	Closure of southern arm at Pinnock Hill Junction results in 1.5km diversion
	Nevinstown Junction	General Traffic	Short-term Significant Negative	Closure of L2305 arm. Existing 4 arm junction reduced to 3 arms, with a left-out slip onto R132 southbound, south of the junction
	L2305 Nevinstown Lane	General Traffic	Short-term Significant Negative	Closure of L2305 causing approx. 1.4km diversion to Pinnock Hill Junction/Airside Junction
	Seatown Junction	Parking and Loading	Short-term Significant Negative	Diversion of access of approx 2.5km to 3.5km and loss of 30% of spaces at Woodies

Section	Link	User Group	Impact	Description
AZ3 Dardistown Depot to Northwood Section	R108 Ballymun Road	General Traffic	Short-term Significant Negative	HGV routeing profile takes several stations worth of site vehicles through this area
AZ4 Northwood to Charlemont Section	Western Commuter Line Maynooth to Docklands	Public Transport	Short-term Significant Negative	Closure for 21 months
	South Western Commuter Line Maynooth and Phoenix Park to Connolly	Public Transport	Short-term Significant Negative	Closure for 5 months
	R108 Ballymun Road /R103 Collins Avenue Junction	General Traffic	Short-term Significant Negative	Increase in traffic flow due to diverted local traffic and increase in HGVs, junction will operate over capacity. 7min Delays on this link
	Mater-Phase 2 and 3 (Berkeley Road)	General Traffic	Short-term Significant Negative	Restricted access to Eccles Street from Berkeley Road, increase of 17% traffic flow on Berkeley Road
	Royal Canal Way	Pedestrians	Short-term Significant Negative	Partial closure of Royal Canal Way, however diversion provided and new bridge (Diversion of over 500m)
	Luke Street	Pedestrians	Short-term Significant Negative	Full closure of footway for the duration of works
	Albert College	Parking and Loading	Short-term Significant Negative	Loss of 42 spaces (42% of public parking within 200m)

9.6.2 Predicted Operational Impact

9.6.2.1 Strategic Overview

The Operational Phase Opening Year is proposed to be 2035, with Design Year 2050 and Forecast Year 2065 for the purposes of this assessment. The Operational Phase of the proposed Project will provide positive impacts for the vast majority of transport users as it will increase the public transport mode share, while reducing use of private vehicles. The proposed Project also presents opportunities to interchange with other modes within the public transport network, presenting significant public transport network journey time savings to and from key locations such as Swords, Dublin Airport and Glasnevin and providing increased travel opportunities and better accessibility across the GDA. The reductions in private vehicles will reduce congestion on some road links, resulting in journey time savings on the road network as well.

Chapter 6 (MetroLink Operations and Maintenance) presents the 12 hour boarding and alighting passengers per station for Opening, Design and Forecast Years in both Scenario A and Scenario B. Diagram 9.50 and Diagram 9.51 present the volume of load passengers throughout the alignments in both scenarios, in the AM peak hour southbound and PM peak hour northbound, respectively. In the AM peak hour, Scenario B sees a lower volume of load passengers for much of the alignment, however between Fosterstown and Northwood it sees approximately 1,000 more passengers than Scenario A. In the PM peak hour, Scenario B remains lower than Scenario A throughout the full alignment.

In the AM peak hour southbound the largest volume of load passengers is in Scenario A 2065 at Glasnevin Station with approximately 15,500 passengers. In Scenario B 2065, Ballymun sees the largest volume of load passengers, reaching approximately 14,000 passengers.

In the PM peak period northbound, Mater Station sees the largest volume of onward load passengers in Scenario A 2065, with approximately 13,500 passengers, whereas Glasnevin sees the largest volume of load passengers in Scenario B reaching almost 10,000. Scenario A and Scenario B largely follow similar trends, with the largest delta in line flow between the two scenarios at O'Connell Street, with Scenario A seeing approximately 3,000 more passengers than Scenario B.

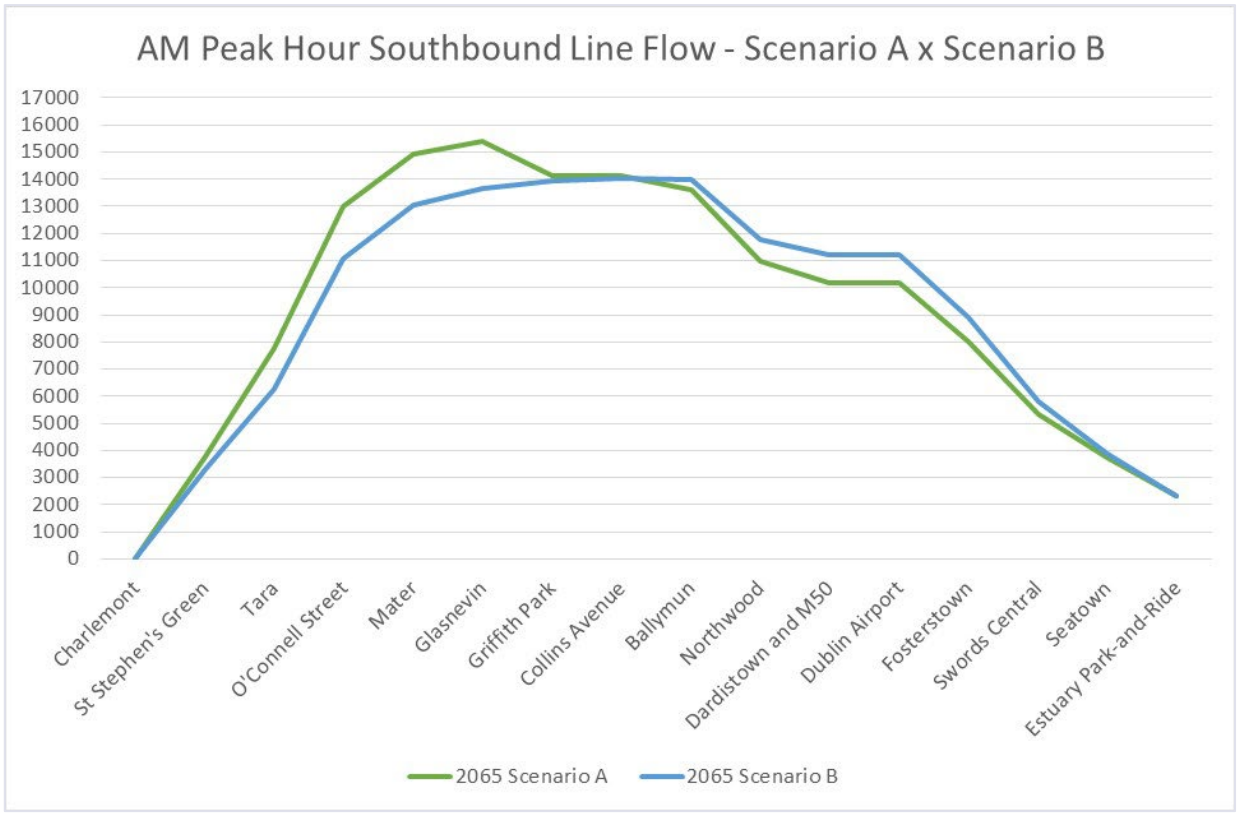

Diagram 9.49: AM Peak Hour Southbound – Scenario A x Scenario B

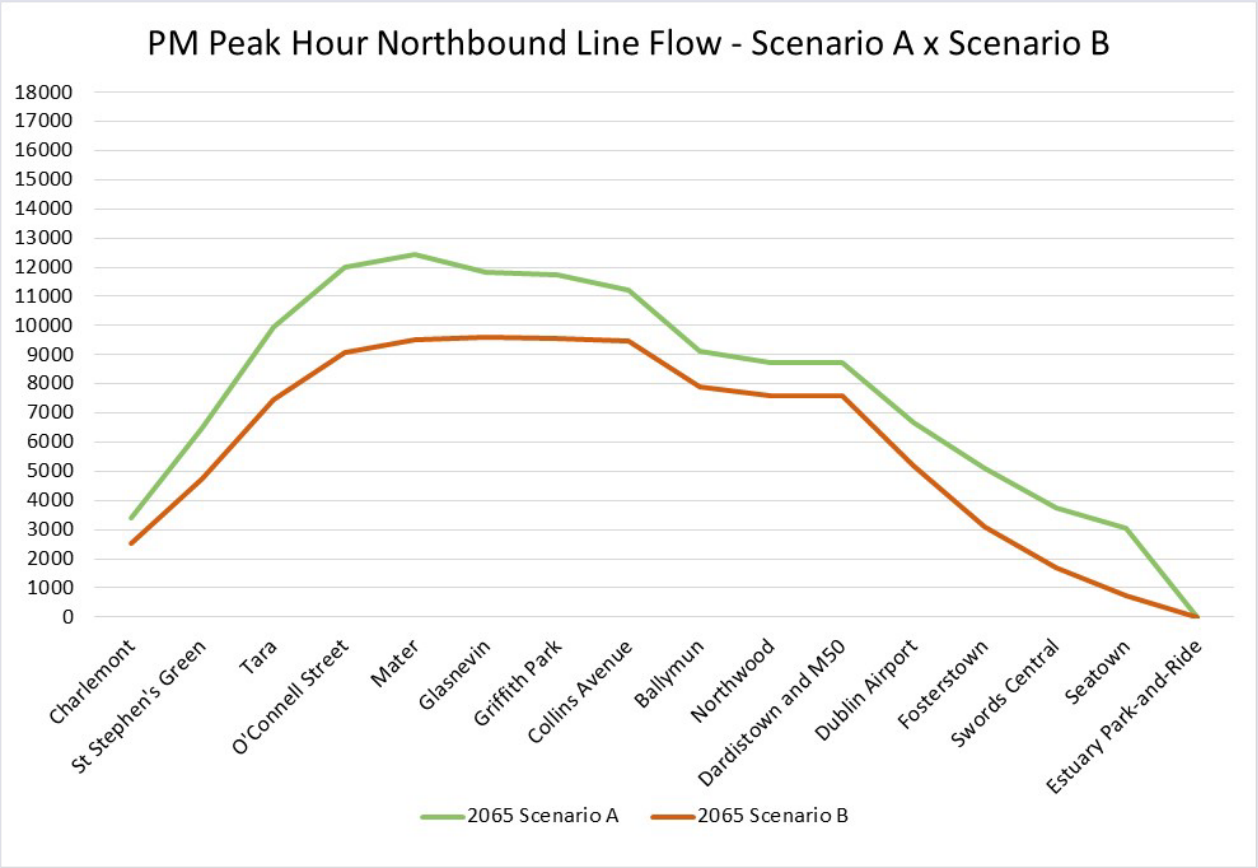

Diagram 9.50: PM Peak Hour Northbound – Scenario A x Scenario B

Further details on the transport impacts relating to non-transport elements can be found in chapters such as Chapter 6 (MetroLink Operations & Maintenance), Chapter 10 (Human Health), Chapter 11 (Population & Land Use), Chapter 16 (Air Quality), and Chapter 17 (Climate).

9.6.2.1.1 Park and Ride

The proposed Park and Ride facility at Estuary Station will have approximately 3,000 spaces.

With increased use of public transport in the Operational Phase of the proposed Project, the strategic road network will experience an overall reduction in AADT and delays. The M50 Motorway, R132 swords Bypass and M50 Port Tunnel see reductions in total traffic flow from the Do Minimum to the Do Something scenario, however the M1 and other local roads north of the Park and Ride Facility see an increase in traffic flow due to people accessing the Park and Ride.

9.6.2.1.2 Mode Share within Area of Influence

Mode share comparisons between the Do Minimum and Do Something scenarios have been undertaken to understand the percentage change in modal split between the two scenarios. Similarly, comparisons have also been undertaken to understand the percentage change in modal split from 2035, to 2050 and 2065. Do Minimum and Do Something mode split over 12 hours, within the Project's Area of Influence, is shown in Table 9.95. The model presents end-to-end means of travel, however the nuances of the Park and Ride module considers Park and Ride users as both a Road trip and a PT trip, regardless of the length of car trip (i.e. the PT element is the primary mode in the full journey). Similarly, as the model presents end-to-end means of travel only, those walking and cycling to a PT node (such as the Project, or bus) are counted as a PT trip only within the mode share calculations.

In Scenario A 2035, the mode share of PT (including the proposed Project) within the Project's area of influence, as defined in section 9.4.1 Study Area, increases by 0.78 percentage points, from 16.33% to 17.10% in the Do Something scenario, whilst Car mode share decreases by 0.3 percentage points from 57.28% to 57%. In the 2050 scenario, PT (including the proposed Project) increases its mode share by

0.92 percentage points between the Do Minimum and Do Something scenarios from 17.09% to 18.01%, whilst Car mode share decreases by 0.55 percentage points from 55.73% to 55.18%, indicating a modal shift from private vehicles to public transport when proposed Project is in place. In 2065, the PT (including the proposed Project) increases its mode share by 1.15 percentage points from 17.80% in the Do Minimum scenario, to 18.94% in the Do Something scenario, whereas the Car mode share falls by 0.82 percentage points from 54.13% to 53.31%.

This results in a long-term Slight positive impact of the proposed Project public transport mode share in both scenarios.

Table 9.95: Scenario A DM -DS Summary of Mode Split – 12 hours

	2035			2050			2065		
Do Minimum									
	12 hour (No. of Trips)	**% Mode Split**	**Difference**	**12 hour (No. of Trips)**	**% Mode Split**	**Difference**	**12 hour (No. of Trips)**	**% Mode Split**	**Difference**
PT	794,921	16.33%	-	934,217	17.09%	-	1,080,951	17.80%	-
Car	2,789,179	57.28%	-	3,047,259	55.73%	-	3,287,397	54.13%	-
Cycle	127,414	2.62%	-	154,709	2.83%	-	185,830	3.06%	-
Walk	1,157,557	23,77%	-	1,331,561	24.35%	-	1,519,462	25.02%	-
Total	4,869,071		-	5,467,747		-	6,073,640		-
Do Something									
PT (Incl the Project)	836,987	17.10%	+0.77pp	988,804	18.01%	+0.92pp	1,155,829	18.94%	+1.14pp
Car	2,788,703	56.98%	-0.3pp	3,029,535	55.18%	--0.55pp	3,252,560	53.31%	-0.82pp
Cycle	123,403	2.52%	-0.1pp	150,012	2.73%	-0.1pp	179,738	2.95%	-0.11pp
Walk	1,145,113	23.40%	-0.37pp	1,321,757	24.08%	-0.27pp	1,513,657	24.81%	-0.21pp
Total	4,894,206			5,490,107			6,101,784		

Mode share comparisons within the Project's area of influence in Scenario B are presented in Table 9.96. In 2035, PT mode share increases by 0.69 percentage points from 17.12% to 17.80%, whilst Car mode share decreases by 0.3 percentage points from 56.9% in the Do Minimum scenario, to 56.6% in the Do Something scenario. In 2050, PT mode share increases by 0.86 percentage points, from 18.69% to 19.54%, whilst Car mode share decreases by 0.4 percentage points from 55.12% to 54.73%. In 2065, PT mode share increases by 0.75 percentage points, from 19.51% to 20.26%, whilst Car mode share decreases by 0.31 percentage points from 53.46% to 53.16%.

Further analysis of the mode share changes in the zones in are presented within each AZ section. Illustrations of these changes are also presented in Figure 9.14 to Figure 9.25.

Table 9.96: Scenario B DM -DS Summary of Mode Split – 12 hours

	2035	2050		2065					
Do Minimum									
	12 hour (No. of Trips)	**% Mode Split**	**Difference**	**12 hour (No. of Trips)**	**% Mode Split**	**Difference**	**12 hour (No. of Trips)**	**% Mode Split**	**Difference**
PT	838,066	17.12%	-	1,029,182	18.69%	-	1,194,155	19.51%	-
Car	2,786,006	56.90%	-	3,036,194	55.12%	-	3,271,934	53.46%	-
Cycle	124,660	2.55%	-	143,782	2.61%	-	170,636	2.79%	-
Walk	1,147,663	23.44%	-	1,298,682	23.58%	-	1,483,217	24.24%	-
Total	4,896,395		-	5,507,840		-	6,119,941		-
Do Something									
PT (Incl the Project)	875,139	17.80%	+0.68pp	1,083,588	19.54%	+0.85pp	1,243,315	20.26%	+0.75pp
Car	2,782,673	56.60%	-0.3pp	3,034,396	54.73%	-0.39pp	3,261,464	53.16%	-0.3pp
Cycle	121,239	2.47%	-0.08pp	139,934	2.52%	-0.09pp	165,473	2.70%	-0.09pp
Walk	1,137,070	23.13%	-0.31pp	1,286,860	23.21%	-0.37pp	1,465,462	23.88%	-0.36pp
Total	4,916,122			5,544,778			6,135,713		

9.6.2.1.2.1 Active Modes Trips

A comparison of the Do Minimum and Do Something scenarios for the Opening Year 2035 has been undertaken, to understand the potential changes in cycling trips due to the Project.

The Project will result in some people switching from cycling to public transport for longer distance travel, for example Swords to Dublin City Centre, but it will also result in a large number of new cycling trips with people cycling to the stations. The reduction in the cycle trips has been obtained by reviewing the 'cycle trips' to/from zones from the ERM model. The cycle trips to stations have been obtained from an analysis of the active mode trips to the Project stations and the distance of these from the stations. As such, the data in Table 9.97 presents end to end cycle trips, and does not reflect the increase in trips associated with people cycling to and from the stations and interchanging with the Project.

Based on the review of the Cycle Trips, a reduction of 3.15% can be seen at selected zones near to the Project's stations over a 12hr period. Table 9.97 below summaries the main differences between the Do Minimum and Do Something scenarios for the year 2035.

Table 9.97: Change in Cycle Trips Do Minimum to Do Something Scenario A 2035

Scenario A - Y2035	Number of trips
Do Minimum	127,414
Do Something	123,403
Difference DM-DS	-4,011
% Difference DM-DS	-3.15%

Figure 9.10 illustrates the % difference in cycle trips to/from zones due to the Project in Scenario A 2035. The percentage reductions are higher to the north of the Project, mainly at the zones near to Dublin Airport and the Swords area. This decrease can be attributed to the likelihood of a mode shift for commuter trips to and from these zones.

Dublin City Centre sees increases in cycle trips in zones in proximity to O'Connell Street and Tara Station. South of the alignment, there are reductions of up to 30% in total cycle trips, as the presence of the Project at Charlemont Station provides an interchange opportunity with the Luas Green Line towards Sandyford.

The Project will produce a large number of new cycling trips as people from the catchment areas use cycling to get to/from the stations. The modelling output provides a total number of people that will access the stations by either walking or cycling. These numbers and the origins and destination of passengers have been analysed to estimate a likely number of future cycle trips to the Project.

A separate methodology has been used to calculate the potential cycle demand associated with each station along the alignment, to inform the cycle parking provisions at each station. Appendix A4.1 Methodology for Potential Cycle Demand provides further details on this.

In total, approximately 164,901 active mode trips are estimated for trips to and from the stations over the 12hr period.

Table 9.98: Actives Modes Summary 2035 (All Zones)

Do Something 2035	Number of Active Modes trips
Trips Produced	81,603
Trips Attracted	83,299
Total Trips	164,901

Figure 9.12 and Figure 9.13 illustrate the Scenario A 2035 total active mode trips produced during the 12hr period. Similar to the difference in cycle trips, the northern section of the alignment produces and attracts greater numbers of active mode trips over the 12hr period.

9.6.2.1.2.2 Mode Share Per Zone

Individual zones along the alignment have also been analysed to assess the change in modal split between the Do Minimum and Do Something scenarios in both Scenario A and Scenario B. Further analysis of the mode share changes in the zones in are presented within each AZ section. Illustrations of these changes are also presented in Figure 9.14 to Figure 9.25.

Figure 9.14 presents the change in total public transport mode share between the Do Minimum and Do Something scenarios in the Scenario A 2035 AM peak hour. The zones around Swords and Dublin Airport see percentage point increases of between 10 and 20 in the Do Something Scenario. Increases of 5 to 10 percentage points can be seen along the Ballymun corridor in the Do Something scenario, with PT mode share in Dublin City Centre seeing increases of between 1 and 5 percentage points.

Figure 9.14 presents the change in Car mode share between the Do Minimum and Do Something scenarios in the Scenario A 2035 AM peak hour. Alongside the increase in PT mode share, the zones around Swords and Dublin Airport also see reductions in Car mode share of up to 10 percentage points.

Figure 9.16 to Figure 9.19 present the changes from Do Minimum to Do Something in PT (including the Project) and Car mode shares in Scenario A 2050 and 2065 in both the AM and PM peak hour. Throughout the Design Years in the Do Something scenario, additional zones along the R132 and at Dublin Airport see an increase of up 20 percentage points in PT mode share. Similarly, in 2050 and 2065, the zones around Dublin Airport see a reduction of up to 20 percentage points in Car mode share.

Figure 9.20 to Figure 9.25 presents the changes in mode share from the Do Minimum scenario to the Do Something scenario in Scenario B 2035, 2050 and 2065 AM and PM peak hours. Scenario B shows similar increases in PT mode share along the alignment in all years. Compared to Scenario A, there are more zones in Scenario B around Dublin Airport that see increases of up to 20 percentage points.

Zones in the Swords area and Dublin Airport see reductions in Car mode share of up to 10 percentage points in Scenario B 2035, increasing to reductions of up to 20 percentage points in 2065. Zones in Dublin City Centre see reductions of up to 5 percentage points, however many of the zones see negligible changes.

9.6.2.1.3 Public Transport Impacts

9.6.2.1.3.1 Scenario A

9.6.2.1.3.1.1 Network Statistics

Table 9.99 presents the public transport network statistics in the Do Minimum and Do Something scenarios in 2035, 2050 and 2065 during the AM and PM 3h period within the Project's Area of Influence. In all scenarios, the total passenger km is higher in the PM period.

In total, there is an increase of approximately 145,000 passenger km on Public Transport between the Do Minimum and Do Something scenarios in 2035 AM period, equating to an increase of 6%. In 2050, the total passenger km travelled by Public Transport increases by approximately 225,000, or 7% when comparing the two scenarios. In 2065, the total passenger km travelled by Public Transport over the AM period increases by over 344,000 when the proposed Project is in place, equating to a 10% increase between the two scenarios.

In all scenarios, the Bus network sees the largest reductions in passenger km travelled, with a reduction of up to 21% in Scenario A 2065 AM peak period, and a reduction of up to 16% in the PM peak period. This is a Very High Negative impact on the bus network, however as identified in section 9.5.1.1.2, many of the corridors are at or near capacity, and therefore it is a positive impact that their passenger km are reduced when the Project is in place. Rail and Luas see marginal reductions in passenger km in the Opening Year, however, increases in passenger km can be seen in both 2050 and 2065 as a result of the interchange opportunities with the Project throughout the alignment.

This results in a long-term Significant positive impact of the proposed Project on public transport network statistics.

Table 9.99: Scenario A - AM 3hr Period Do Minimum and Do Something Public Transport Statistics

Network Statistics	Mode	2035			2050			2065		
		Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Passenger Km	**Bus**	1,264,718	1,020,719	-19%	1,433,825	1,141,207	-20%	1,610,782	1,278,872	-21%
	Rail	934,527	929,733	-1%	1,166,849	1,205,967	3%	1,419,955	1,516,801	7%
	Luas	375,410	369,076	-2%	441,504	441,866	0%	514,062	522,593	2%
	Metro	-	400,062		-	478,492		-	570,809	
	Total	2,574,654	2,719,590	6%	3,042,179	3,267,532	7%	3,544,799	3,889,074	10%

In total, there is an increase of approximately 170,000 passenger km, or 6%, on Public Transport between the Do Minimum and Do Something scenarios in 2035 PM peak period. In 2050, the total passenger km travelled by Public Transport increases by approximately 268,000, or 9%, when comparing the two scenarios. In 2065, the total passenger km travelled by Public Transport over the PM period increases by approximately 441,000, or 12% when the proposed Project is in place, illustrating the long-term Significant positive impact of the proposed Project.

Table 9.100: Scenario A PM 3hr Period Public Transport Network Statistics

Network Statistics	Mode	2035			2050			2065		
		Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Passenger Km	Bus	1,236,047	1,039,571	-16%	1,380,944	1,153,962	-16%	1,519,362	1,270,002	-16%
	Rail	1,063,600	1,063,743	0%	1,331,854	1,361,694	2%	1,609,571	1,714,099	6%
	Luas	353,991	352,257	0%	416,218	419,443	1%	486,635	495,724	2%
	Metro	-	369,003		-	461,574		-	577,106	
	Total	2,653,638	2,824,574	6%	3,129,015	3,396,673	9%	3,615,568	4,056,931	12%

9.6.2.1.3.1.2 Journey Times

Comparisons between the Do Minimum and Do Something scenarios has been undertaken to investigate changes to end-to-end public transport journey times with the proposed Project in place. Model results of journey time differences (in minutes) between Do Minimum and Do Something scenarios in Scenario A 2050 AM period are presented in Table 9.101, with the results for all scenarios presented in the Overall TTA (Appendix A9.2).

Overall, the proposed Project has a long-term Significant positive impact on end-to-end public transport journey times.

The proposed Project provides substantial time savings in 2035, 2050 and 2065, from a range of locations in north Dublin, Dublin City Centre, and south Dublin. The public transport journey time from O'Connell Street to Dublin Airport sees a saving of approximately 20-21 minutes across the forecast years between these key locations.

The largest public transport journey time saving occurs for journeys to and from Swords Pavilion and Glasnevin, with a saving of approximately 48 minutes in all of the forecast years, equating to a reduction of 61% from the Do Minimum scenario.

A saving of approximately 29 minutes can be seen from Dublin Airport to Sandyford at the south of the city in 2050, as a result of the Project interchange with the Luas Green Line at Charlemont Station, increasing to a saving of 32 minutes in 2065, in the AM period. This equates to an approximate 37% reduction in public transport journey time from the Do Minimum scenario. Similar end-to-end public transport journey time savings can also be seen from Swords Pavilion to Blanchardstown. Improvements can also be seen along the proposed Project corridor, with time savings of up to 22minutes to and from DCU and Ballymun, equivalent to a 35% reduction in journey time.

In the PM period, the largest reduction in end-to-end public transport journey time in each of the forecast years is between Swords Pavilion and Glasnevin as a result of the interchange with the rail network at Glasnevin Station, which sees a saving of approximately 42-43 minutes in public transport journey time when the proposed Project is in place. The Fingal Metro corridor sees consistent end-to-end public transport journey time savings to and from key locations such as O'Connell Street and St Stephen's Green, with journey time savings of approximately 30minutes in 2065 from both locations to Swords Pavilion.

Table 9.101: Scenario A 2050 AM Period - Journey Time Comparisons (minutes) between Do Minimum and Do Something

Journey Time 2050 DS - 2050 DM Scenario A AM Period	O'Connell Street	St Stephen's Green	College Street (Trinity)	Glasnevin	DCU	Rathgar Road	Coolock	Ballymun	Finglas	Sandyford	Tallaght	Red Cow	Blanchardstown	Ashbourne	Donabate	Balbriggan	Drogheda	Swords Pavilion	Swords East	Dublin Airport
O'Connell Street	0.0	-0.1	0.0	-3.5	-11.6	0.1	0.3	-15.3	-2.1	0.0	-0.1	-0.1	-1.0	-1.4	0.0	0.0	0.0	-20.9	-1.8	-19.5
St Stephen's Green	0.0	0.0	0.0	-2.5	-10.6	0.0	0.3	-14.5	-0.5	0.0	-0.1	-0.1	-1.7	-3.4	0.0	0.0	0.0	-22.0	-2.9	-22.7
College Street (Trinity)	0.0	0.0	0.0	-0.9	-7.8	0.1	0.3	-12.0	0.5	0.0	-0.1	-0.1	0.0	-1.2	0.0	0.0	0.0	-14.2	2.2	-17.1
Glasnevin	-4.4	-9.4	-1.3	0.0	-0.1	-12.9	-11.7	0.8	0.3	-17.9	-0.1	-0.1	-13.7	-1.3	-6.3	-12.1	4.4	-38.8	-25.0	-24.4
DCU	-5.4	-11.2	-3.9	0.1	0.0	-14.2	0.1	0.0	-0.2	-17.2	-1.9	-2.1	-1.5	-2.2	-19.0	-14.8	-0.9	-22.7	-22.3	-15.5
Rathgar Road	0.0	0.0	0.1	-9.5	-14.5	0.0	-1.9	-20.8	-8.6	0.0	0.1	0.1	-8.8	-10.4	-0.3	-0.4	-1.3	-27.9	-0.2	-29.1
Coolock	0.3	0.4	0.4	-4.4	0.1	-2.1	0.0	-0.3	-0.1	-1.1	0.4	0.5	0.4	-4.5	0.4	0.4	-0.9	-10.4	0.4	-1.7
Ballymun	-11.1	-16.9	-9.6	1.5	0.1	-19.9	0.0	0.0	-0.2	-22.9	-7.7	-7.8	-15.4	-2.0	-16.3	-19.2	-2.0	-19.4	-18.9	-12.1
Finglas	0.6	-4.4	1.2	0.3	-0.1	-13.2	-0.1	0.1	0.0	-12.7	3.6	3.6	0.1	-1.5	-6.0	-18.8	-1.1	-23.8	-23.1	-17.1
Sandyford	0.0	0.1	0.0	-8.0	-13.7	0.0	0.4	-19.0	-4.1	0.0	-15.1	-0.1	-1.9	-9.7	-0.2	-0.2	0.0	-29.0	-8.1	-27.4
Tallaght	-0.1	0.0	-0.1	1.1	-10.3	-0.2	0.2	-10.9	3.5	-0.6	0.0	0.0	0.3	-1.7	0.0	-0.1	-0.1	-17.8	-0.2	-15.8
Red Cow	0.0	0.0	-0.1	0.1	-7.0	0.4	0.2	-10.9	3.5	0.2	0.0	0.0	0.0	-1.7	0.0	0.0	0.0	-16.0	1.4	-6.6
Blanchardstown	0.5	-0.7	0.7	-14.6	-7.1	-1.4	0.1	-14.9	0.2	-2.0	0.1	0.1	0.0	3.3	-0.2	-0.2	-0.2	-27.9	-8.2	-21.6
Ashbourne	-1.2	-1.2	-1.2	-1.3	-0.9	-2.6	-1.8	-1.5	-1.5	-3.0	-0.7	-0.7	-10.4	0.0	2.1	2.1	1.8	1.7	1.7	3.8
Donabate	1.9	0.0	0.0	-6.1	-11.6	1.0	2.2	-18.6	-12.3	-1.7	1.9	1.9	1.9	0.3	0.0	0.0	0.0	0.9	0.0	-9.1

Journey Time 2050 DS - 2050 DM Scenario A AM Period	O'Connell Street	St Stephen's Green	College Street (Trinity)	Glasnevin	DCU	Rathgar Road	Coolock	Ballymun	Finglas	Sandyford	Tallaght	Red Cow	Blanchardstown	Ashbourne	Donabate	Balbriggan	Drogheda	Swords Pavilion	Swords East	Dublin Airport
Balbriggan	0.0	-0.6	-0.6	-8.1	-10.8	0.6	0.3	-23.4	-4.2	-2.3	0.0	0.0	0.0	2.7	0.1	0.0	-0.1	6.1	-0.1	5.0
Drogheda	0.1	0.1	0.1	-0.1	2.0	1.0	2.0	2.1	1.8	-1.6	0.1	0.1	0.1	-0.2	-0.1	-0.2	0.0	-8.3	-0.2	2.1
Swords Pavilion	-20.4	-21.7	-12.6	-47.6	-22.0	-25.0	-13.6	-21.6	-27.3	-29.8	-14.9	-14.5	-31.6	-0.6	0.0	0.4	-4.1	0.0	0.0	-15.5
Swords East	-0.1	1.3	3.9	-24.9	-23.0	1.5	5.2	-22.6	-25.7	-8.1	2.7	2.7	-12.4	-0.6	-0.7	0.4	-0.7	0.0	0.0	-16.5
Dublin Airport	-20.6	-14.9	-10.1	-30.6	-9.4	-21.2	-0.7	-8.7	-6.9	-29.2	4.3	10.6	-27.5	-5.5	-0.7	0.5	-0.2	-10.0	-8.5	0.0

9.6.2.1.3.1.3 Interchange with other Modes

Table 9.102 to Table 9.104 presents the volume of passengers transferring to and from other modes to the proposed Project in Scenario A. Further breakdown of the transfers during the AM and PM periods per station is contained within the station specific TTA reports (Appendix A9.2). A 'First Boarder' refers to a passenger who first accesses the public transport network via the proposed Project. Therefore, passengers who transfer from bus/rail/Luas to the proposed Project are not considered 'First Boarders'. A 'Final Destinations' passenger is someone who exits the public transport network via the proposed Project. Therefore, passengers who transfer to bus/rail/Luas from the proposed Project to continue their journey are not considered to be 'Final Destinations' passengers.

In all years, Dublin City Centre locations see large numbers of passengers interchanging between the bus network the proposed Project for their onward journey, as these locations are hubs for employment so passengers may have origins or final destinations in residential areas outside of Dublin City Centre. It is evident at Glasnevin and Tara Stations that a significant volume of passengers will interchange between the DART network and the Project, with approximately 5,400 passengers interchanging with DART at Glasnevin, and 6,400 passengers interchanging at Tara Station in 2035. This increases to over 10,700 at both Glasnevin and Tara Street in 2065. The location of the Charlemont station also facilitates large volumes of interchange with the Luas Green Line.

Table 9.102: Scenario A 2035 12 hour Transfers Per Station

Transfers To/From MetroLink Stations - 12 hour Period								
Station	**Transfers to MetroLink**				**Transfers from MetroLink**			
	First Boarders	**From Bus**	**From Rail/DART**	**From Luas**	**Final Destination**	**To Bus**	**To Rail/DART**	**To Luas**
Estuary	6,167	3,316	-	-	6,206	2,410	-	-
Seatown	4,063	292	-	-	3,965	290	-	-
Swords Central	4,740	780	-	-	4,301	1,478	-	-
Fosterstown	3,634	3,139	-	-	3,096	2,629	-	-
Dublin Airport	25,730	525	-	-	23,870	641	-	-
Dardistown	-	-	-	-	-	-	-	-
Northwood	2,737	101	-	-	2,353	124	-	-
Ballymun	5,946	2,454	-	-	5,275	3,219	-	-
Collins Avenue	5,676	1,930	-	-	5,473	2,899	-	-
Griffiths Park	2,225	8	-	-	2,454	34	-	-
Glasnevin	1,785	2,127	2,898	-	1,936	1,171	2,505	-
Mater	2,871	1,885	-	-	2,769	1,369	-	-
O Connell Street	5,013	333	-	4,233	4,796	102	-	3,826
Tara	8,000	5,057	3,064	4	8,373	9,674	3,346	1
SSG	7,761	3,560	-	-	8,393	3,279	-	-
Charlemont	5,704	2,619	-	6,546	6,007	3,209	-	5,452

Table 9.103: Scenario A 2050 12 hour Transfers Per Station

Transfers To/From MetroLink Stations - 12 hour Period								
Station	Transfers to MetroLink				Transfers from MetroLink			
	First Boarders	From Bus	From Rail/DART	From Luas	Final Destination	To Bus	To Rail/DART	To Luas
Estuary	8,045	2,696	-	-	7,979	2,191	-	-
Seatown	4,964	487	-	-	5,009	351	-	-
Swords Central	6,255	924	-	-	5,759	1,853	-	-
Fosterstown	5,075	3,207	-	-	3,965	3,123	-	-
Dublin Airport	38,337	584	-	-	34,622	699	-	-
Dardistown	-	-	-	-	-	-	-	-
Northwood	3,585	140	-	-	3,022	180	-	-
Ballymun	7,901	2,784	-	-	6,922	3,776	-	-
Collins Avenue	6,313	2,301	-	-	6,160	3,698	-	-
Griffiths Park	2,548	8	-	-	2,827	38	-	-
Glasnevin	2,133	2,630	4,084	-	2,320	1,371	3,643	-
Mater	3,487	2,353	-	-	3,355	1,757	-	-
O Connell Street	6,111	470	-	6,012	5,867	113	-	5,468
Tara	9,946	6,832	3,963	5	10,520	12,721	4,460	1
SSG	9,126	4,311	-	-	10,010	3,849	-	-
Charlemont	6,933	3,154	-	8,114	7,358	3,889	-	6,945

Table 9.104: Scenario A 2065 12 hour Transfers Per Station

Transfers To/From MetroLink Stations - 12 hour Period								
Station	Transfers to MetroLink				Transfers from MetroLink			
	First Boarders	From Bus	From Rail/DART	From Luas	Final Destination	To Bus	To Rail/DART	To Luas
Estuary	7,320	3,057	-	-	7,550	2,723	-	-
Seatown	6,064	745	-	-	6,106	425	-	-
Swords Central	7,913	1,085	-	-	7,411	2,127	-	-
Fosterstown	6,307	3,442	-	-	4,948	3,639	-	-
Dublin Airport	49,043	680	-	-	47,300	854	-	-
Dardistown	-	-	-	-	-	-	-	-
Northwood	4,683	181	-	-	3,839	235	-	-
Ballymun	10,204	3,417	-	-	8,774	4,470	-	-
Collins Avenue	7,043	2,831	-	-	6,795	4,286	-	-
Griffiths Park	2,996	8	-	-	3,259	45	-	-
Glasnevin	2,530	3,310	5,797	-	2,748	1,744	5,071	-
Mater	4,316	2,916	-	-	4,102	2,050	-	-
O Connell Street	7,507	619	-	8,172	7,053	139	-	7,143
Tara	12,308	9,153	5,084	8	12,631	15,652	5,654	2
SSG	10,525	5,130	-	-	11,416	4,520	-	-
Charlemont	8,435	3,854	-	10,008	8,900	4,533	-	8,542

9.6.2.1.3.1.4 Link Flows

Figure 9.26 and Figure 9.27 illustrates the change in public transport flows in the AM and PM peaks when the proposed Project is in operation in Scenario A.

Reductions on the passenger flow on the bus network can be seen along the M50 Port Tunnel towards Dublin Airport, as well as along the R108 Ballymun Road bus corridor, and the R132 Swords Bypass corridor. Increases in flows can be seen on the Luas Red and Green Lines, and the Maynooth and Kildare DART lines, indicating areas of interchange with the proposed Project.

Table 9.105 and Table 9.106 present the changes in public transport flows on other light and heavy railway as result of the proposed Project, during the AM and PM peak hours between the Do Minimum and Do Something scenarios. The AM peak hour is defined as 08:00-09:00, and the PM peak hour is defined as 17:00-18:00.

In the AM peak hour, the 2035 scenario sees flows on the DART Coastal Northern Line decrease by 5%, however this reduction decreases to 0% in 2065. As identified in section 9.5.1, this service is operating under capacity, however approaching the 0.8 threshold of 'near capacity' in the baseline conditions, and therefore a reduction in usage on this line will improve levels of service on the line. This is a Low magnitude of impact, on a service of High significance and sensitivity, leading to a long-term, Moderate, positive impact on the DART Coastal Northern Line.

The largest increase is seen on the Maynooth Line in 2065, which sees flows increase by 9% in 2035, as a result of the opportunity to interchange with the Project at Glasnevin Station. This increases to a 15% increase in flows in 2065. As identified in section 9.5.1, this service is operating under capacity in the Do Minimum scenario, an increase in passenger numbers will not reduce the level of comfort for passengers. This is a change of Medium magnitude, on a highly significant service (due to the ability to interchange), and therefore this is a long-term, Significant, negative impact on the Maynooth Line.

In the PM peak hour, the Kildare Line and Luas Red Line which see the largest increase in usage at 13% respectively when the proposed Project is in place. The Maynooth Line sees a 10% increase in usage. As identified in section 9.5.1, each of these lines are operating under capacity in the Do Minimum scenario, and therefore increases in flows will not reduce the passenger comfort levels on these services. These are changes of Low to Medium magnitude, on services of High significance and sensitivity, resulting in long-term, Significant, negative impacts on the Maynooth and Kildare lines, whilst having long-term, Significant, positive impacts on the Luas Green Line.

Table 9.105: Changes in Public Transport Flows due to proposed Project – AM Peak Hour Scenario A

Public Transport Line	2035 Do Minimum	Change MetroLink 2035	% Change 2035	2050 Do Minimum	Change MetroLink 2050	% Change 2050	2065 Do Minimum	Change MetroLink 2065	% Change 2065
DART Coastal Northern Line	9,200	- 453	**-5%**	11,375	- 332	**-3%**	13,722	- 56	**0%**
DART Coastal South-East Line	6,561	41	**1%**	7,403	355	**5%**	8,370	526	**6%**
Kildare Line	4,192	183	**4%**	5,398	490	**9%**	6,818	895	**13%**
Maynooth Line	3,624	313	**9%**	4,602	503	**11%**	5,761	885	**15%**
Luas Red Line	6,177	251	**4%**	7,123	659	**9%**	8,354	816	**10%**

Public Transport Line	2035 Do Minimum	Change MetroLink 2035	% Change 2035	2050 Do Minimum	Change MetroLink 2050	% Change 2050	2065 Do Minimum	Change MetroLink 2065	% Change 2065
Luas Green Line (South of Charlemont)	8,583	468	**5%**	9,571	661	**7%**	10,692	1,035	**10%**

Table 9.106: Changes in Public Transport Flows due to proposed Project – PM Peak Hour Scenario A

Public Transport Line	2035 Do Minimum	Change MetroLink 2035	% Change 2035	2050 Do Minimum	Change MetroLink 2050	% Change 2050	2065 Do Minimum	Change MetroLink 2065	% Change 2065
DART Coastal Northern Line	8,927	- 342	-4%	11,031	- 514	-5%	13,023	- 168	-1%
DART Coastal South-East Line	5,313	63	1%	6,284	218	3%	7,321	343	5%
Kildare Line	4,621	92	2%	5,854	379	6%	7,325	930	13%
Maynooth Line	4,126	284	7%	5,297	391	7%	6,621	694	10%
Luas Red Line	5,849	275	5%	6,800	604	9%	7,901	994	13%
Luas Green Line (South of Charlemont)	6,867	394	6%	7,702	552	7%	8,803	689	8%

9.6.2.1.3.2 Scenario B

9.6.2.1.3.2.1 Network Statistics

Table 9.107 presents the public transport network statistics in the Do Minimum and Do Something scenarios in Scenario B 2035, 2050 and 2065 during the AM 3hr period, with Table 9.108 presenting the PM 3hr period statistics. In all scenarios, the total passenger km is higher in the PM period. When comparing the two scenarios during the AM period, in total, there is an increase of approximately 137,200 passenger km between the Do Minimum and Do Something scenarios in 2035 AM period, equating to an increase of 5%. In 2050, the total passenger km travelled increases by approximately 202,000, or 6% when comparing the two scenarios. In 2065, the total passenger km travelled over the AM period increases by over 236,400 when the proposed Project is in place, which is an increase of 6%.

Table 9.107: Scenario B – AM 3hr Period Do Minimum and Do Something Public Transport Statistics

Network Statistics	Mode	2035			2050			2065		
		Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Passenger Km	**Bus**	1,107,260	887,141	-20%	1,102,110	883,188	-20%	1,231,367	970,647	-21%

	Rail	1,397,654	1,375,668	-2%	1,523,673	1,484,887	-3%	1,824,559	1,757,376	-4%
	Luas	337,330	332,233	-2%	534,625	530,975	-1%	611,610	611,522	0%
	Metro	-	384,412		-	463,341		-	564,469	
	Total	**2,842,245**	**2,979,454**	**5%**	**3,160,408**	**3,362,391**	**6%**	**3,667,535**	**3,904,014**	**6%**

In the Scenario B PM 3hr period, in total, there is an increase of approximately 137,200 passenger km between the Do Minimum and Do Something scenarios in 2035 PM peak period, equating to an increase of 5%. In 2050, there is an increase of approximately 240,000 passenger km when comparing the two scenarios. In 2065, the total passenger km travelled over the PM period increases by almost 200,800 or 5%, when the proposed Project is in place. As such, Scenario A sees greater percentage increases in total passenger km travelled in all years, however Scenario B has a greater absolute passenger km than Scenario A.

Table 9.108: Scenario B PM 3hr Period Public Transport Network Statistics

Network Statistics	Mode	2035			2050			2065		
		Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Passenger Km	**Bus**	1,114,472	933,622	-16%	1,139,407	954,132	-16%	1,273,201	1,048,733	-18%
	Rail	1,553,788	1,535,623	-1%	1,638,592	1,610,140	-2%	1,955,416	1,913,607	-2%
	Luas	318,303	318,916	0%	516,068	517,080	0%	595,100	598,549	1%
	Metro	-	335,627		-	452,720		-	463,618	
	Total	**2,986,563**	**3,123,789**	**5%**	**3,294,067**	**3,534,072**	**-7%**	**3,823,716**	**4,024,506**	**-5%**

9.6.2.1.3.2.2 Journey Times

The proposed Project provides substantial end-to-end public transport journey time savings in 2035, 2050 and 2065, from a range of locations in north Dublin, the Dublin City Centre, and south Dublin. Table 9.109 presents the Scenario B 2050 AM Period, with the results of all scenarios presented in the Overall TTA (Appendix A9.2). In the 2050 AM peak period, the largest public transport journey time savings can be seen in journeys to and from Dublin Airport and Swords Pavilion. The largest end-to-end public transport journey time saving occurs from Swords Pavilion to Glasnevin, with a saving of approximately 25-35minutes minutes across the three forecast years. This equates to an approximate 45% reduction in journey time from the Do Minimum scenario in 2035, and up to a 60% reduction in journey time in 2065. A saving of approximately 27minutes occurs for end-to-end public transport journeys from Dublin Airport to Rathgar Road at the south of Dublin City Centre in 2050, increasing to a saving of 30minutes in 2065, in the AM period. Similar public transport journey time savings can also be seen from Swords Pavilion to Blanchardstown. Improvements can also be seen along the Ballymun corridor, with time savings of approximately 16minutes to and from DCU and Ballymun.

In the PM period, the largest saving in end-to-end public transport journey time in 2035 is from Glasnevin to Swords Pavillions, which sees a saving of approximately 38minutes in journey time when the proposed Project is in place. The Fingal corridor sees consistent journey time savings to and from key locations such as O'Connell Street and St Stephen's Green, with journey time savings of approximately 30 minutes in 2065.

These journey time savings present a long-term Profound positive impact of the proposed Project on the public transport network; however, these savings are lower than those of Scenario A.

Table 9.109: Scenario B 2050 AM Period - Journey Time Comparisons (minutes) between Do Minimum and Do Something

Journey Time 2050 DS - 2050 DM Scenario B AM Period	O'Connell Street	St Stephen' s Green	College Street (Trinity)	Glasnevin	DCU	Rathgar Road	Coolock	Ballymun	Finglas	Sandyford	Tallaght	Red Cow	Blanchardstown	Ashbourne	Donabate	Balbriggan	Drogheda	Swords Pavilion	Swords East	Dublin Airport
O'Connell Street	0.0	0.0	0.0	-4.7	-11.1	0.0	0.0	-14.1	0.0	0.0	0.0	0.0	-0.3	-0.5	-2.6	0.0	-0.1	-18.2	0.9	-21.7
St Stephen's Green	0.0	0.0	0.0	-3.5	-9.5	0.0	0.0	-13.5	0.0	0.0	0.1	0.0	0.0	-1.3	0.0	0.0	0.0	-19.7	-0.6	-22.7
College Street (Trinity)	0.0	0.0	0.0	0.1	-6.9	0.0	0.0	-10.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.4	-11.5	2.7	-17.1
Glasnevin	-1.0	-4.2	0.4	0.0	-0.1	-11.1	-0.1	1.1	0.1	-13.3	0.5	1.3	0.0	0.1	-3.9	-3.5	-0.1	-32.1	-10.2	-23.3
DCU	-2.7	-8.2	-0.8	0.0	0.0	-9.7	0.0	0.0	0.0	-11.4	0.4	0.4	1.1	0.3	-0.2	-0.1	-0.1	-15.4	-14.9	-8.6
Rathgar Road	0.0	-0.1	-0.1	-11.0	-13.8	0.0	-1.5	-19.2	0.0	0.0	0.0	0.4	-1.9	-2.3	-0.1	-0.1	-6.5	-24.9	2.3	-27.4
Coolock	0.0	0.0	-0.2	-0.3	-0.1	0.0	0.0	0.3	0.0	-0.1	0.0	0.1	-0.1	0.2	0.0	0.0	-0.1	-4.8	0.2	-0.8
Ballymun	-8.6	-14.1	-7.1	0.0	0.0	-16.2	0.0	0.0	0.0	-18.0	-5.1	-5.1	-2.9	0.0	-13.3	-8.9	-0.3	-17.4	-16.7	-10.5
Finglas	0.0	0.0	0.0	0.1	0.1	0.0	-0.4	0.0	0.0	0.0	0.2	0.2	0.0	0.0	-0.2	-0.5	0.0	-20.9	-1.4	-9.2
Sandyford	-0.1	0.0	0.0	-10.8	-15.5	0.0	-1.2	-19.4	0.0	0.0	8.1	0.0	-1.1	-0.7	0.0	0.0	2.8	-26.8	-6.1	-32.2
Tallaght	0.0	0.0	0.0	1.2	-7.5	0.0	0.0	-10.4	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-13.0	2.1	-16.6
Red Cow	0.0	0.0	0.0	1.4	-7.8	0.0	-0.1	-10.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-14.2	2.4	-4.7
Blanchardstown	-0.1	0.1	0.1	0.1	-0.5	-0.7	0.1	-3.1	0.1	-0.8	0.0	0.1	0.0	0.2	-0.1	0.1	0.1	-25.6	-7.2	-18.3
Ashbourne	0.0	0.0	0.0	-0.1	0.4	-0.1	-0.2	-0.1	-0.1	-0.1	0.4	0.4	-0.4	0.0	2.2	0.8	-0.3	1.7	0.4	8.1
Donabate	0.0	0.0	0.0	-2.9	-0.2	0.0	0.0	-14.8	0.2	0.0	0.1	0.2	0.0	0.3	0.0	0.0	0.0	0.9	-2.5	-1.7

Balbriggan	0.0	0.0	0.0	-2.0	-0.9	0.0	0.0	-17.7	-0.3	0.0	0.1	0.2	0.0	1.9	0.0	0.0	0.1	2.5	-3.3	2.8
Drogheda	-0.1	0.0	0.0	-10.6	-2.3	0.0	0.0	-2.5	-2.2	0.0	0.0	0.1	0.0	0.5	0.0	0.4	0.0	1.8	-2.6	-2.5
Swords Pavilion	-28.5	-28.4	-20.8	-35.0	-16.9	-29.5	-10.2	-16.7	-12.4	-31.1	-21.3	-22.0	-35.1	-0.6	0.7	6.9	-5.1	0.0	0.0	-10.7
Swords East	-10.2	-8.4	-3.9	-22.9	-17.9	-9.8	5.7	-17.6	-23.4	-14.0	-4.2	-5.7	-19.7	-0.6	-1.4	6.0	-1.4	0.0	0.0	-11.6
Dublin Airport	-24.3	-19.8	-15.0	-31.9	-8.2	-26.7	-0.9	-7.8	1.1	-28.7	3.2	14.8	-27.1	-6.4	-1.6	6.9	0.1	-10.8	-8.9	0.0

9.6.2.1.3.2.3 Interchange with Other Modes

Table 9.110 to Table 9.112 presents the volume of passengers transferring to and from other modes to the Project in Scenario B. A breakdown of the transfers during the AM and PM periods per station is contained within the station specific TTA reports (Appendix A9.2).

In all years, Dublin City Centre locations see large numbers of passengers interchanging between the bus network and the proposed Project for their onward journey, as these locations are hubs for employment so passengers may have origins or final destinations in residential areas outside of Dublin City Centre. Scenario B sees large volumes of passengers interchanging with the bus network at Ballymun and Collins Avenue Stations, with over 2,000 more passengers at both stations in Scenario B 2035. It is evident at Glasnevin and Tara Street that a significant volume of passengers will interchange between the DART network and the proposed Project, with approximately 13,500 passengers interchanging with DART at Glasnevin, and 5,600 passengers interchanging at Tara Street in 2035. The location of the Charlemont Station also facilitates large volumes of interchange with the Luas Green Line, with over 19,100 passengers interchanging with the Luas in 2065. Scenario B sees high volumes of interchanging passengers as a result of the implementation of other key public transport infrastructure projects compared to Scenario A.

Table 9.110: Scenario B 2035 12 hour Transfers Per Station

Transfers To/From MetroLink Stations - 12 hour Period								
Station	Transfers to MetroLink				Transfers from MetroLink			
	First Boarders	From Bus	From Rail/DART	From Luas	Final Destination	To Bus	To Rail/DART	To Luas
Estuary	5,964	1,636	-	-	5,860	949	-	-
Seatown	3,660	697	-	-	3,760	304	-	-
Swords Central	4,348	691	-	-	3,878	1,358	-	-
Fosterstown	4,720	2,570	-	-	4,024	2,868	-	-
Dublin Airport	27,049	378	-	-	23,878	320	-	-
Dardistown	-	-	-	-	-	-	-	-
Northwood	2,630	98	-	-	2,382	143	-	-
Ballymun	5,853	2,354	-	-	5,194	2,731	-	-
Collins Avenue	5,706	2,055	-	-	5,450	2,373	-	-
Griffiths Park	1,857	7	-	-	2,297	28	-	-
Glasnevin	1,391	1,214	6,469	-	1,540	1,509	7,158	-
Mater	2,738	957	-	-	2,622	1,143	-	-
O Connell Street	4,948	272	-	3,173	4,733	112	-	2,893
Tara	7,224	4,014	2,746	8	7,602	8,390	2,874	2
SSG	8,123	4,064	-	-	8,209	3,081	-	-
Charlemont	6,197	3,003	-	6,565	6,234	3,800	-	5,676

Table 9.111: Scenario B 2050 12 hour Transfers Per Station

Transfers To/From MetroLink Stations - 12 hour Period								
Station	Transfers to MetroLink				Transfers from MetroLink			
	First Boarders	From Bus	From Rail/DART	From Luas	Final Destination	To Bus	To Rail/DART	To Luas
Estuary	7,553	2,741	-	-	7,593	1,223	-	-
Seatown	4,786	997	-	-	4,785	436	-	-

Transfers To/From MetroLink Stations - 12 hour Period								
Station	Transfers to MetroLink				Transfers from MetroLink			
	First Boarders	From Bus	From Rail/DART	From Luas	Final Destination	To Bus	To Rail/DART	To Luas
Swords Central	6,581	927	-	-	5,563	1,782	-	-
Fosterstown	6,191	3,185	-	-	5,218	3,194	-	-
Dublin Airport	41,664	411	-	-	40,336	311	-	-
Dardistown	-	-	-	-	-	-	-	-
Northwood	3,184	126	-	-	2,846	201	-	-
Ballymun	7,636	2,032	-	-	6,504	2,378	-	-
Collins Avenue	6,008	1,743	-	-	5,926	1,901	-	-
Griffiths Park	1,978	6	-	-	2,351	17	-	-
Glasnevin	1,518	846	4,419	-	1,663	1,111	5,123	-
Mater	3,208	1,331	-	-	2,995	1,305	-	-
O Connell Street	5,799	731	-	5,100	5,628	106	-	5,022
Tara	8,389	5,535	2,620	2,863	8,951	10,862	2,834	1,976
SSG	7,453	4,228	900	-	8,148	2,995	400	-
Charlemont	5,831	3,092	-	8,210	6,165	3,853	-	8,151

Table 9.112: Scenario B 2065 12 hour Transfers Per Station

Transfers To/From MetroLink Stations - 12 hour Period								
Station	Transfers to MetroLink				Transfers from MetroLink			
	First Boarders	From Bus	From Rail/DART	From Luas	Final Destination	To Bus	To Rail/DART	To Luas
Estuary	5,079	2,779	-	-	4,802	1,551	-	-
Seatown	5,032	1,076	-	-	5,230	578	-	-
Swords Central	7,170	1,342	-	-	6,148	2,098	-	-
Fosterstown	7,367	3,275	-	-	6,321	3,886	-	-
Dublin Airport	50,998	352	-	-	47,017	309	-	-
Dardistown	-	-	-	-	-	-	-	-
Northwood	3,975	159	-	-	3,486	242	-	-
Ballymun	9,443	2,300	-	-	8,052	2,589	-	-
Collins Avenue	6,430	1,814	-	-	6,439	2,094	-	-
Griffiths Park	2,133	5	-	-	2,499	21	-	-
Glasnevin	1,714	1,055	5,528	-	1,849	988	6,401	-
Mater	3,708	1,470	-	-	3,461	1,574	-	-
O Connell Street	6,577	460	-	5,998	6,352	118	-	6,212
Tara	9,648	7,731	3,075	3,373	10,514	13,984	3,488	2,455
SSG	8,271	4,652	931	-	9,056	3,303	560	-
Charlemont	6,656	3,498	-	9,523	7,028	4,400	-	9,591

9.6.2.1.3.2.4 Link Flows

Figure 9.28 and Figure 9.29 illustrate the changes in public transport flows in Scenario B 2035 AM and PM. Table 9.113 and Table 9.114 present the changes to public transport flow on the heavy and light rail networks when the proposed Project is in place in Scenario B. Notable changes occur in 2035 both AM and PM with the DART North Coastal Line seeing a reduction of 14% in the 2035 AM peak hour, increasing to an 8% reduction in 2065. In the PM peak hour, there is 5% reduction in 2035, increasing to a 6% reduction in 2065. As identified in section 9.5.1, the DART Coastal Northern Line is operating under capacity in the Do Minimum scenario in Scenario B. This is a change of Medium magnitude, on a service of High significance, resulting in a long-term, Significant, positive impact on the line.

The largest increase in the AM peak hour is seen on the Luas Green Line, with flows increasing by 6% in the 2035 and 2050 scenarios, and by 5% in 2065 Do Something scenario, whereas the Luas Red Line sees the largest increase in the 2065 PM, with an increase of 8%. Both services operate under capacity in the Do Minimum scenario and therefore this increase is a long-term, Moderate, positive impact on Luas services. In 2035, the Kildare Line sees an 3% increase in flows in both peak hours, however this decreases to a 0% change in 2050, and an increase of 2% in 2065. The Kildare line operates under capacity in the Do Minimum scenario, as identified in section 9.5.1. This change is of Low magnitude, on a highly significant and sensitive service, and therefore results in a long-term, Moderate, positive impact on the network.

Table 9.113: Changes in Public Transport Flows due to proposed Project – AM Peak Hour Scenario B

Public Transport Line	2035 Do Minimum	Change MetroLink 2035	% Change 2035	2050 Do Minimum	Change MetroLink 2050	% Change 2050	2065 Do Minimum	Change MetroLink 2065	% Change 2065
DART Coastal Northern Line	11,189	- 492	**-4%**	12,588	31	**0%**	15,067	- 1,256	**-8%**
DART Coastal South-East Line	6,475	- 51	**-1%**	7,023	- 227	**-3%**	7,952	- 244	**-3%**
Kildare Line	7,589	238	**3%**	10,171	32	**0%**	12,355	225	**2%**
Maynooth Line	9,436	115	**1%**	12,138	- 177	**-1%**	14,437	- 215	**-1%**
Luas Red Line	5,315	40	**1%**	5,485	199	**4%**	5,847	301	**5%**
Luas Green Line (South of Charlemont)	8,334	469	**6%**	12,462	754	**6%**	14,005	758	**5%**

Table 9.114: Changes in Public Transport Flows due to proposed Project – PM Peak Hour Scenario B

Public Transport Line	2035 Do Minimum	Change MetroLink 2035	% Change 2035	2050 Do Minimum	Change MetroLink 2050	% Change 2050	2065 Do Minimum	Change MetroLink 2065	% Change 2065
DART Coastal Northern Line	10,555	-519	**-5%**	11,714	-128	**-1%**	13,894	-837	-6%
DART Coastal South-East Line	5,356	-28	**-1%**	5,750	-112	**-2%**	6,581	-144	**-2%**
Kildare Line	8,258	227	**3%**	10,764	-32	**0%**	12,585	297	**2%**
Maynooth Line	7,991	121	**2%**	10,066	-16	**0%**	12,446	-87	**-1%**
Luas Red Line	4,895	157	**3%**	5,540	317	**6%**	6,111	463	**8%**
Luas Green Line (South of Charlemont)	6,552	462	**7%**	10,154	580	**6%**	11,501	622	**5%**

9.6.2.1.4 Road Network Impacts

9.6.2.1.4.1 Overall Network Statistics

Table 9.115 to Table 9.118 presents the summary of the overall network statistics in both the Do Minimum and Do Something scenarios within the Project's Area of Influence. In both Scenario A and Scenario B, a reduction can be seen in the road distance travelled in the AM and PM periods when comparing the Do Minimum and Do Something scenarios, with the highest reduction of 3.7% in 2065 in Scenario A PM Peak Period.

The largest reductions in Road travel time can be seen in 2065 Scenario A in both the AM and PM peak periods, with a reduction of 5% in the AM peak period, and a reduction of 4% in the PM peak period. Scenario B sees no change to Road travel time in 2065 in either the AM or PM peak periods.

Table 9.115: Scenario A, AM Peak Period Summary Network Statistics

Network Statistics	2035			2050			2065		
	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Total Road Travel Time (PCU.hrs per peak period)	365,228	361,231	-1%	439,065	424,121	-3%	512,493	487,317	-5%
Total Road Distance Travelled (PCU.km per peak period)	14,417,697	14,391,811	-0.2%	16,010,097	15,598,910	-2.6%	17,263,083	16,633,043	-3.6%
Average Road Network Speed (kph)	38.6	38.7	0.2%	37.7	37.8	0.3%	36.9	37.0	0.4%

Table 9.116: Scenario B, AM Peak Period Summary Network Statistics

Network Statistics	2035			2050			2065		
	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Total Road Travel Time (PCU.hrs per peak period)	363,521	361,212	-1%	336,700	333,971	-1%	401,324	402,246	0%
Total Road Distance Travelled (PCU.km per peak period)	14,259,221	14,235,538	-0.2%	14,380,597	14,425,745	0.3%	15,772,179	15,870,371	0.6%
Average Road Network Speed (kph)	39.1	39.1	0.1%	40.5	40.5	0.2%	39.5	39.5	-0.1%

In the PM peak period, Scenario A sees greater reductions in total road distance travelled in both 2050 and 2065 than Scenario B when the proposed Project is in place.

Table 9.117: Scenario A PM Peak Period Summary Network Statistics

Network Statistics	2035			2050			2065		
	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Total Road Travel Time (PCU.hrs per peak period)	339,951	337,529	-1%	397,340	384,917	-3%	453,435	436,305	-4%
Total Road Distance Travelled (PCU.km per peak period)	13,791,124	13,786,946	0.0%	15,149,517	14,764,919	-2.5%	16,320,545	15,722,416	-3.7%
Average Road Network Speed (kph)	39.5	39.5	0.0%	38.7	38.8	0.1%	38.0	38.2	0.4%

Table 9.118: Scenario B PM Peak Period Summary Network Statistics

Network Statistics	2035			2050			2065		
	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff	Do Minimum	Do Something	Diff
Total Road Travel Time (PCU.hrs per	340,337	338,518	-1%	314,198	315,994	1%	369,071	367,558	0%

peak period)									
Total Road Distance Travelled (PCU.km per peak period)	13,572,426	13,549,604	-0.2%	13,758,393	13,917,419	1.2%	15,100,811	15,089,924	-0.1%
Average Road Network Speed (kph)	40.0	40.0	0.1%	40.5	41.5	2.4%	40.6	40.6	0.0%

9.6.2.1.4.2 Link Flows

Diagram 9.52 displays the difference in traffic flows on the highway network with the proposed Project in place in Scenario A 2035 AM Peak Hour, the green shows a decrease in flows and the red shows an increase in flows. When the proposed Project is in place, there are large reductions in traffic to and from the zones around the alignment to the north of the M50 Motorway when comparing the Do Minimum and Do Something scenarios. Notable decreases are seen in traffic flows around Dublin Airport including along the M1 and R132 Swords Bypass.

Increases in traffic flows are seen along the M1 and north Dublin areas as there is an increase of people accessing the Park and Ride facility at Estuary Station.

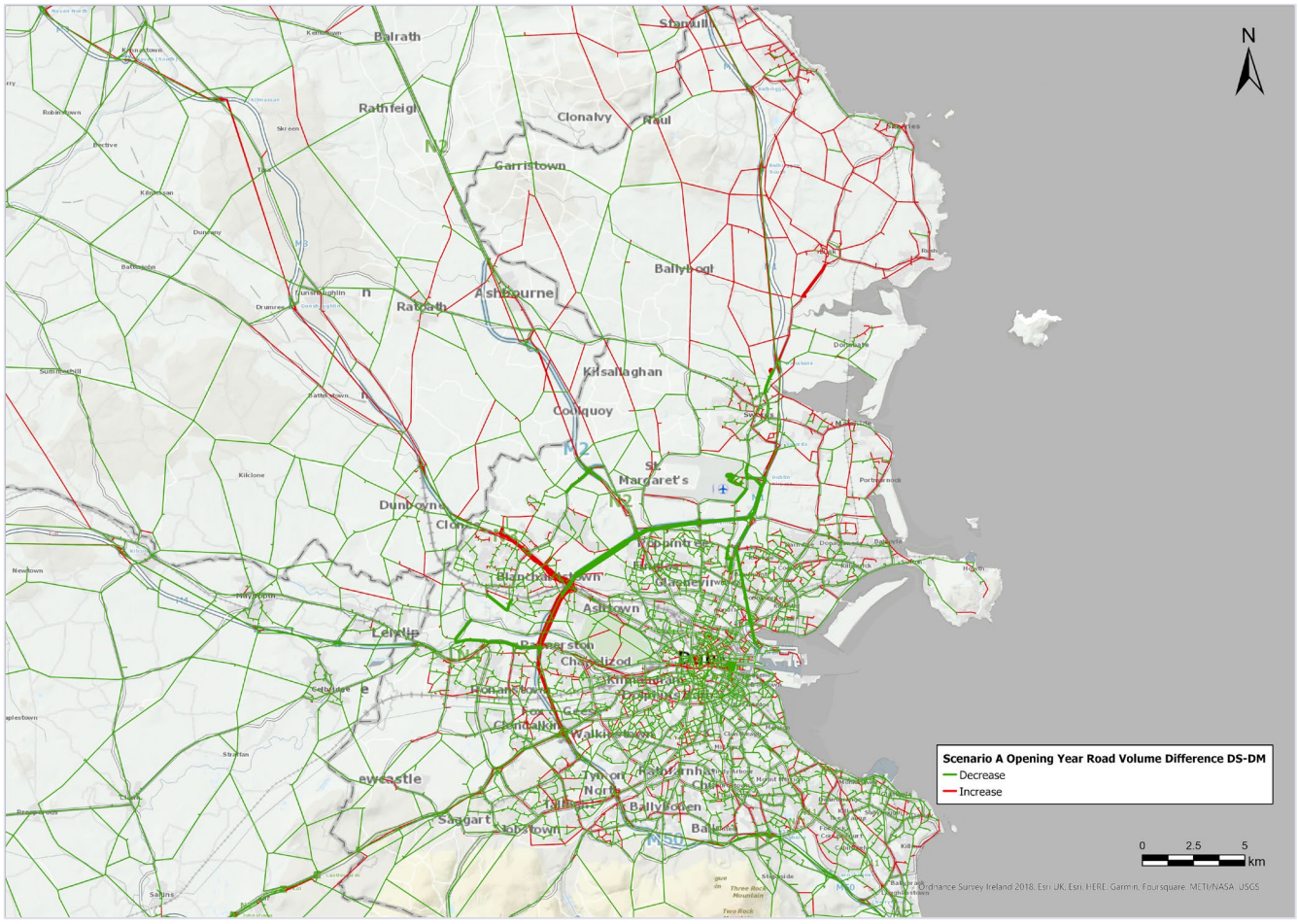

Diagram 9.51: Highway Model - Flow Changes Scenario A 2035 AM Peak

9.6.2.1.4.2.1 Scenario A

Figure 9.30 to Figure 9.32 show the AADT traffic flow differences between the Do Something and Do Minimum scenario in 2035, 2050 and 2065 in Scenario A, with a summary presented in Table 9.119. In

Scenario A in 2035, the largest reductions can be seen on the M1, where there are reductions of over 5,000 AADT. These reductions can be seen along the M1 to Dublin Airport, with reductions of up to 2,500 AADT along the M50 Motorway. Along the R132, there are reductions of between 2,500 and 5,000 AADT. Increases of up to 2,000 AADT can be seen on the On and Off-slips at the M1 Lissenhall Junction, which is in close proximity to the Park and Ride facility. Reductions in AADT traffic flow can also be seen along key national routes such as the M3, M4, M7/M9 and M11. This relates to the transfer of road passengers onto the public transport network, utilising the Maynooth, Kildare and Cork rail lines. In 2050 and 2065, the R132 sees further reductions of over 5,000 AADT when the Project is in place. The Port Tunnel sees reductions of between 2,500 and 5,000 AADT. Large reductions of over 5,000 AADT continue to be seen along the M1 to Dublin Airport and onto the M50 Motorway. In all years, reductions of between 100 and 500 AADT can be seen on the network within Dublin City Centre.

Table 9.119: AADT Differences from Do Minimum to Do Something in Scenario A at Key Locations

Location	2035 AADT Diff	2050 AADT Diff	2065 AADT Diff
R132 Swords Bypass	-5,000 < -2,500	<-5,000	<-5,000
M1 (North of Park and Ride)	<-5,000	<-5,000	<-5,000
M1 (South of Park and Ride)	<-5,000	<-5,000	<-5,000
Dublin Airport	-5,000 < -2,500	-2,500 < -1,000	+2,500 < 5,000
M50 Port Tunnel	-2,500 < -1,000	-5,000 < -2,500	<-5,000
Dublin City Centre	-100 < +100	-250 < -100	-500 < -250

9.6.2.1.4.2.2 Scenario B

Figure 9.33 to Figure 9.35 present the difference in AADT in 2035, 2050 and 2065 in Scenario B when the Project is in place, compared to the Do Minimum scenario. In Scenario B 2035, the M1 in the Swords area sees reductions of up to 2,500 AADT, however there are reductions of over 5,000 AADT at the Dublin Airport/M1 Junction. Much of Dublin City Centre sees negligible changes. National roads such as the M, M4, M7/9 and M11 see reductions of between 1,000 and 5,000 AADT. In 2050, links in Dublin City Centre see reductions of up to 250 AADT. Due to the introduction of other public transport infrastructure in Scenario B, the cumulative improvement of the public transport network in the Do Something means that road capacity is freed, and therefore slight increases in AADT can be seen along the M50 Motorway, with increases of between 250 and 500 AADT. Similar increases in AADT ca be seen in the Port Tunnel. However, in 2065, there are more widespread reductions of up 500 AADT within Dublin City Centre, along the M50 Motorway and in the Swords area.

This presents a long-term, Significant, positive impact on the road network.

Table 9.120: AADT Differences from Do Minimum to Do Something in Scenario B at Key Locations

Location	2035 AADT Diff	2050 AADT Diff	2065 AADT Diff
R132 Swords Bypass	-1,000 < -500	-1,000 < -500	-1,000 < -500
M1 (North of Park and Ride)	+ 2,500 < 5,000	+ 2,500 < 5,000	-250 < -100
M1 (South of Park and Ride)	-2,500 < -1,000	-2,500 < -1,000	-100 < +100
Dublin Airport	-2,500 < -1,000	-2,500 < -1,000	+ 2,500 < 5,000
M50 Port Tunnel	-500 < -250	-500 < -250	+100 < 250
Dublin City Centre	-100 < +100	-250 < -100	-250 < -100

9.6.2.1.4.3 Changes in Road Travel Time

9.6.2.1.4.3.1 Scenario A

Figure 9.36 to Figure 9.38 present the changes in Road travel time (delays) with the proposed Project in place in the AM and PM peaks in 2035, 2050 and 2065, compared to the Do Minimum scenario. Overall,

the road network sees a range of long-term Moderate positive to long-term Significant positive impacts on road travel times as a result of the proposed Project.

In Scenario A 2035 AM peak hour, road travel time savings of up to 500s (~8 mins) can be seen on the on-slip at the M1 Lissenhall Junction as a result of the presence of the Park and Ride. Road travel time savings of up to 250s (~4mins) can be seen at Dublin Airport and along the R132 Swords Bypass. Individual sections of the M50 Motorway and locations within Dublin City Centre are forecast to have road travel time savings of up to 25s when the Project is in place.

In Scenario A 2050 similar results can be seen at the M1 Lissenhall Junction On-Slip and at Dublin Airport. Where the M50 Motorway joins the M1, an increase in road travel time can be seen of up to 50s, however much of the M50 Motorway sees road travel time savings of between 25 and 100s.

In Scenario A 2065, there are slight increases in road travel time on the M1 Lissenhall Junction Off-Slip, with increases of up to 25s. The R132 Swords Bypass and Links leading to and from Dublin Airport continue to see road travel time savings in this scenario. The Port Tunnel sees road travel time savings of up to 25s, as well as the section of the M50 Motorway in the vicinity of the Northwood Station.

Table 9.121: Summary of Change in Road Travel Time from Do Minimum to Do Something in Scenario A in AM peak hour

Location	2035 Change in Road Travel Time	2050 Change in Road Travel Time	2065 Change in Road Travel Time
M1 (North of Park and Ride)	-10s < +10s	-10s < +10s	+10s < +25s
M1 (South of Park and Ride)	-500s < -250s	-500s < -250s	-1,000s < -500s
R132 Swords Bypass	-250s < -100s	-100s < -50s	-100s < -50s
Dublin Airport	-250s < -100s	-250s < -100s	-250s < -100s
M50 Motorway	-25s < -10s	-25s < -10s	-50s < -25s
Dublin City Centre	-25s < -10s	-10s < +10s	-10s < +10s

9.6.2.1.4.3.2 Scenario B

Figure 9.39 to Figure 9.41 present the impacts on road travel times in 2035, 2050 and 2065 Scenario B when the proposed Project is in place, compared to the Do Minimum scenario. In Scenario B 2035, there are negligible changes in travel time on the road network, with fluctuations (both increases and savings) of up to 10s on individual sections of the M1, M50 Motorway and R132 Swords Bypass. The R132 on the northbound approach to the Park and Ride facility sees an increase in road travel time of up to 25s.

In Scenario B 2050, increases in road travel time of up to 25s can be seen on the M1 north of the Park and Ride facility, however individual sections of the R132 Swords Bypass have road travel time savings of 100s. At Dublin Airport, road travel time savings of up to 250s (~4mins) can be seen on the Corballis Road North and T2 Departures Road. Individual sections of the M50 Motorway and locations within Dublin City Centre see negligible variations in road travel time.

In Scenario B 2065, the M1 sees road travel time savings of up to 25s south of the Lissenhall Junction, with negligible changes north of the Park and Ride. This increases to a road travel time saving of up to 100s on the M1 on approach on Dublin Airport. The R132 Swords Bypass also sees negligible changes to road travel times in this scenario. The internal road network at Dublin Airport sees road travel time savings of up to 1,000s (~16mins) on the Arrivals Road to the south of Terminal 1, with the T2 Departures Road sees road travel time savings of up to 250s (~4mins).

This is a long-term, Significant, positive impact of the Project on the road network in Scenario B.

Table 9.122: Summary of Change in Road Travel Time from Do Minimum to Do Something in Scenario B in AM peak hour

Location	2035 Change in Road Travel Time	2050 Change in Road Travel Time	2065 Change in Road Travel Time
M1 (North of Park and Ride)	-10s < +10s	+10 s< +25s	-10s < +10s
M1 (South of Park and Ride)	-10s < +10s	-25s < -10s	-100s < -50s
R132 Swords Bypass	+10 s< +25s	-100s < -50s	-10s < +10s
Dublin Airport	-10s < +10s	-250s < -100s	-1,000s < -500s
M50 Motorway	-25s < -10s	-10s < +10s	-25s < -10s
Dublin City Centre	-10s < +10s	-10s < +10s	-10s < +10s

9.6.2.2 Local Level Impacts

9.6.2.2.1 AZ1 Northern Section

This section of the chapter presents a description of the impacts on the public transport, road, pedestrian, cycle and parking network in the AZ1 Northern Section (Estuary to DANP) during the Operational Phase. The stations within this section include:

- Estuary Station and Park and Ride Facility;
- Seatown Station;
- Swords Central Station; and
- Fosterstown Station.

Further details on the operational impacts can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Diagram 9.53 presents the 12hr peak period total trip demand in the AZ1 Northern Section in Scenario A. The total trip demand increases by 16% between 2035 and 2050 from 118,985 trips to 137,460 trips. There is 14% increase in trips from 2050 to 2065, reaching a total trip demand of 156,314 trips.

Total PT mode share increases by 5 percentage points from 13% Do Minimum to 18% Do Something in 2035. In 2050, there is an increase of 6 percentage points from 13% in the Do Minimum to 19% in the Do Something. In 2065, the total PT mode share increases by 7 percentage points from 14% in the Do Minimum to 21% in the Do Something.

In 2035, Car mode share reduces by 2 percentage points between the Do Minimum and Do Something scenarios, from 65% in the Do Minimum to 63% in the 2035 Do Something. In 2050, Car mode share reduces by 3 percentage points from 64% in the 2050 Do Minimum to 61% in the 2050 Do Something, and reduces by 3 percentage points in the 2065 scenario from 61% in the Do Minimum to 58% in the Do Something.

Active Modes mode share (which includes end-to-end Walking and Cycling trips, but does not include interchange with the Project) reduces by up to 4 percentage points in 2065. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ1 Northern Section.

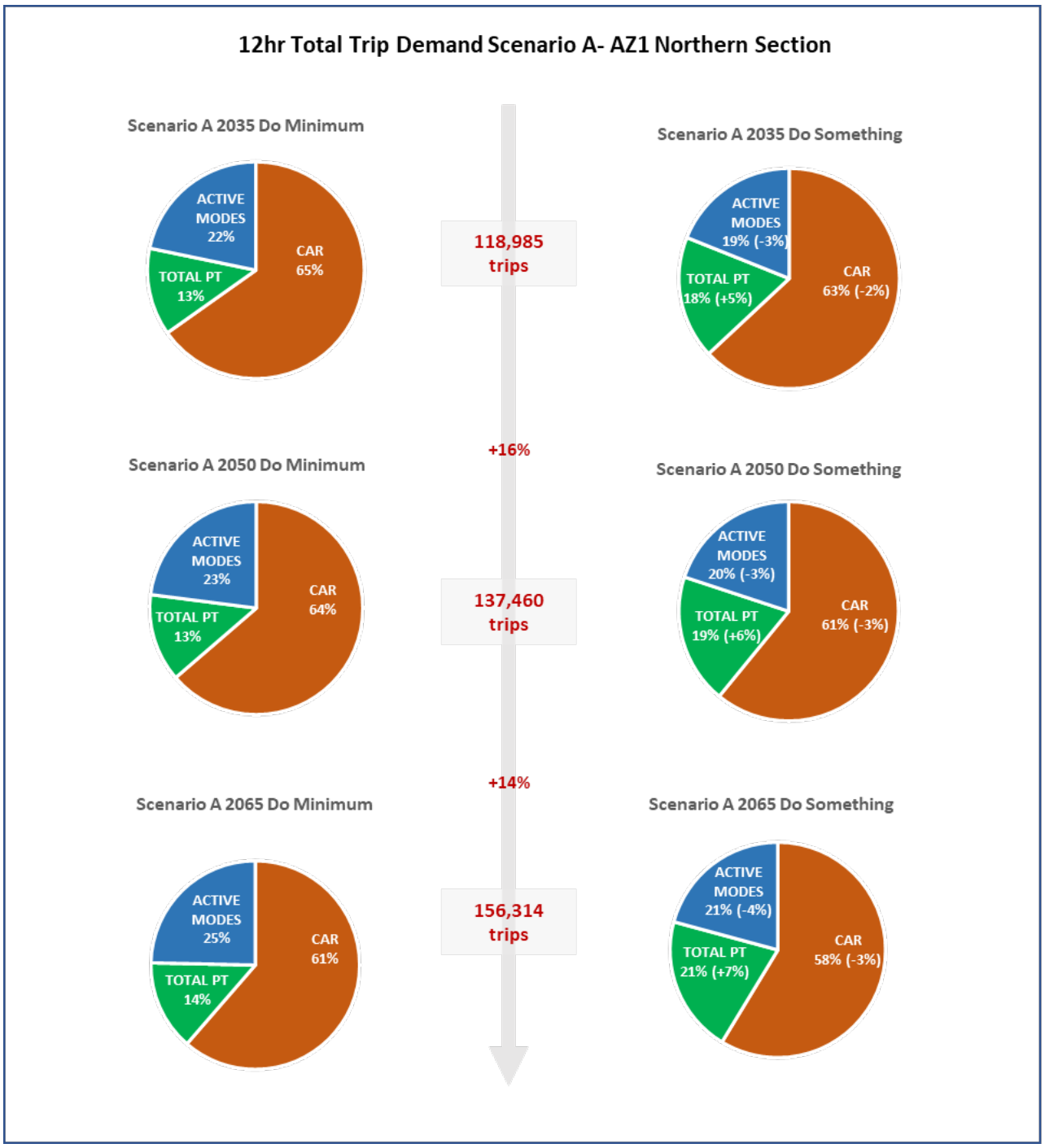

Diagram 9.52: Scenario A 12hrPeak Period Total Trip Demand- AZ1 Northern Section

Diagram 9.54 presents the 12hr peak period total trip demand in the AZ1 Northern Section in Scenario B. The total trip demand increases by 16% between 2035 and 2050 from 119,349 trips to 138,845 trips. There is a 12% increase in trips from 2050 to 2065, reaching a total trip demand of 155,867 trips.

Total PT mode share increases by 5 percentage points from 13% Do Minimum to 18% Do Something in 2035. In 2050, PT mode share increases by 7 percentage points from 13% in the Do Minimum to 20% in the Do Something. In 2065, the total PT mode share increases by 6 percentage points from 14% in the Do Minimum to 20% in the Do Something.

Car mode share reduces by 3 percentage points from 66% in the 2035 Do Minimum scenario to 63% in the 2035 Do Something scenario. In 2050, Car mode share reduces by 4 percentage points from 64% in the Do Minimum scenario to 60% in the Do Something scenario. In 2065, Car mode share reduces by 3 percentage points from 62% in the Do Minimum scenario to 59% in the Do Something scenario.

Active Modes mode share (which includes Walking and Cycling) reduces by 2-3 percentage points in all years. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the Project, as presented in Section 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ1 Northern Section.

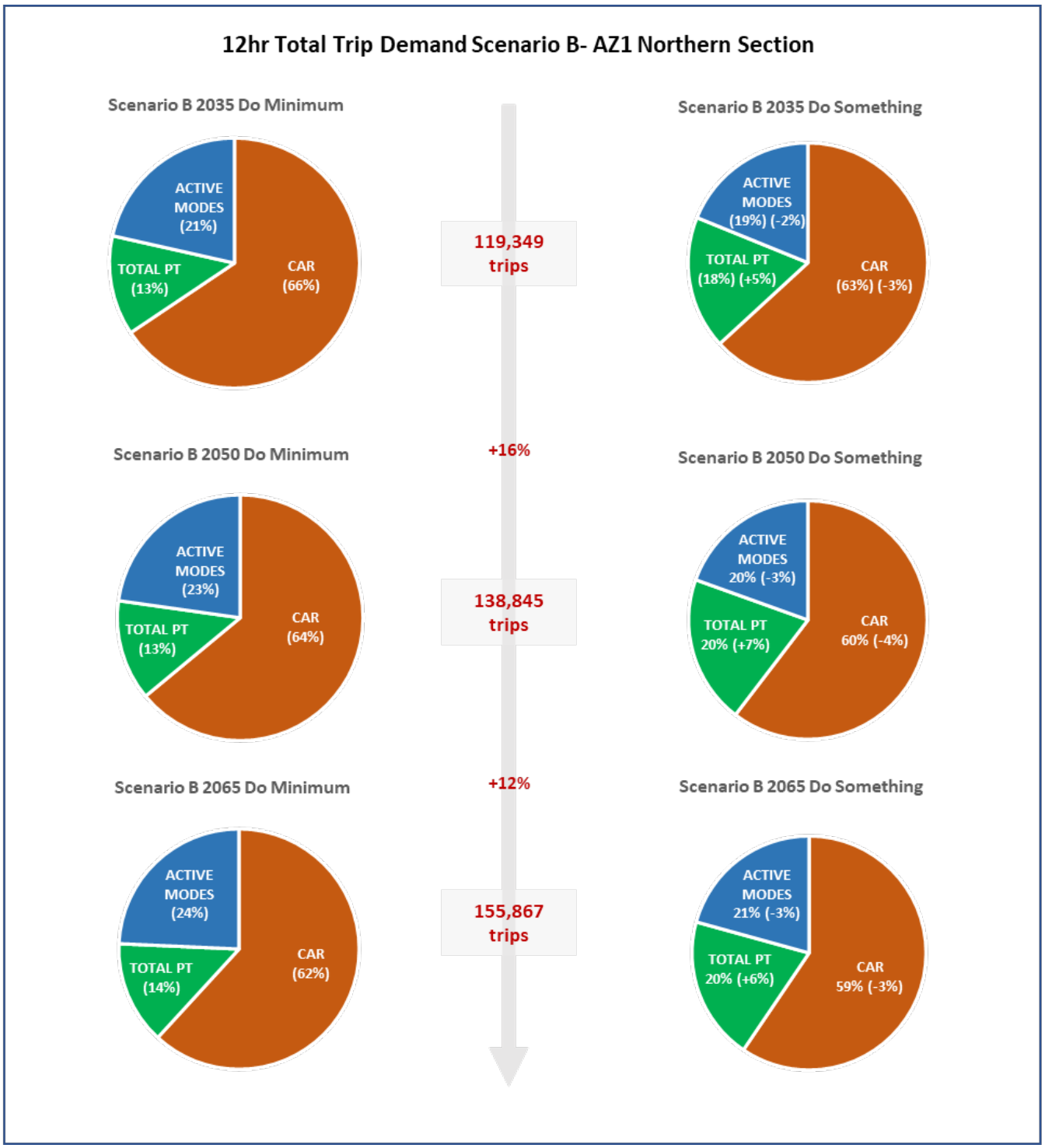

Diagram 9.53: Scenario B 12hr Period Total Trip Demand – AZ1 Northern Section

9.6.2.2.1.1 Public Transport Operational Impact Assessment

In AZ1 Northern Section in Scenario A 2035, there are an additional 5,800 PT trips made when the Project is in place over the 12hr peak period, with total PT mode share increasing by 5 percentage points from the Do Minimum scenario. In 2050, there are an additional 7,900 PT trips made in the Do Something

scenario, increasing total PT mode share by 6 percentage points. In 2065, there are an additional 10,200 PT trips made in the Do Something scenario, increasing total PT mode share by 7 percentage points.

In Scenario B 2035, there are an additional 6,000 PT trips made when the Project is in place over the 12hr peak period, with total PT mode share increasing by 5 percentage points from the Do Minimum scenario. In 2050, there are an additional 9,500 PT trips made in the Do Something scenario, increasing total PT mode share by 7 percentage points. In 2065, there are an additional 9,200 PT trips made in the Do Something scenario, increasing total PT mode share by 6 percentage points.

Figure 9.14 to Figure 9.24 presents the changes in PT (including the Project) mode share between the Do Minimum and Do Something scenarios in 2035, 2050 and 2065 in both Scenario A and Scenario B. In 2035 in both Scenario A and Scenario B, PT (including the Project) mode share sees increases of up to 10 percentage points in the zones to the east of the stations in the AZ1 Northern Section, resulting in a long-term Slight positive impact. Zones to the west of the stations see increases of up to 5 percentage points, resulting in a long-term, Slight, positive impact.

In the 2050 and 2065 AM peak hours, these zones see an increase of up to 20 percentage points to the east of the R132, resulting in a long term Moderate positive impact, with an increased number of zones to the west seeing increase of up to 10 percentage points in PT (including the proposed Project) mode share. This results in a long-term, Slight, positive impact.

The largest savings in PT journey time are from the Swords Pavillions area (Journey time savings tables in Section 9.6.2.1.3 Public Transport Impacts). In both Scenario A and Scenario B, PT journey time savings can be seen for journeys from the Swords Pavillions area to Glasnevin, with savings of up to 48 minutes in Scenario A 2065, and up to 43 minutes in Scenario B 2065. Savings of approximately 12-20 minutes can also be seen for journeys from the Swords Pavillions area to a number of Dublin City Centre locations across the forecast years in Scenario A, and between 20 and 30 minutes in Scenario B.

In Scenario A 2035 AM period, Balbriggan to Ballymun sees a saving of almost 20 minutes when the proposed Project is in place. In Scenario B, this same journey time saving is much lower, as the Do Minimum public transport network is much improved in this scenario.

These time savings present long-term, Significant, positive impacts to the public transport network.

Table 9.123 presents a summary of the impact on the public transport network in AZ1 in the Operational Phase.

Table 9.123: Summary of Operational Impact on Public Transport Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Balbriggan to Ballymun	PT journey time saving of 21 minutes in 2065 Scenario A	High->+25% from baseline	Medium- Other City Bound Route	Long-term Significant Positive
Swords Pavillions to Glasnevin	PT Journey time saving of approx. 48mins – both scenarios	High->+25% from baseline	High- Core Bus Corridor	Long-term Profound Positive
Swords Pavillions to Dublin City Centre	PT Journey time saving of approx. 20-30 mins – both scenarios	High->+25% from baseline	High – Core Bus Corridor	Long-term Significant Positive
Swords Pavillions to Sandyford	PT journey time savings of approx. 32mins – both scenarios	High->+25% from baseline	High- Core Bus Corridor	Long-term Significant Positive

9.6.2.2.1.2 General Traffic Operational Impact Assessment

Park and Ride Facility

The Park and Ride facility will be present during the Operational Phase and will result in changes in traffic flows within the receiving environment. A drop-off lay by is also present to the east of the future Estuary Station. Roads such as the R132 and sections of the M1 Lissenhall junction will experience increases in flows when the proposed Project is operational due to the increased volume of people accessing the Park and Ride facility from the surrounding settlements such as Balbriggan, Drogheda and Dundalk. However, areas south of the Park and Ride Facility such as the M1 south of Lissenhall will experience reductions in overall traffic flows, as noted in Section 9.6.2.1.4 Road Network Impacts.

The AM projected 2035 traffic flows including the operational flows are shown within the Estuary Station TTA (Appendix A9.2) for both the Northern and Southern Lissenhall junctions. The Lissenhall Junction (South) is predicted to operate within capacity overall under both the 2035 Do Minimum and 2035 Do Something AM peak hour scenarios.

The results show that the Lissenhall Junction (North) is predicted to operate within capacity overall under the 2035 Do Something AM peak hour scenario. The M1 Southbound Off Ramp will increase from 72.0% in the Do Minimum scenario to 75.6% in the Do Something scenario, resulting in queues remaining consistent from 13 PCU to 12 PCU. Assuming 1 PCU is 5.75m, the queue in the Do Something scenario will be approximately 69m in length across two lanes. The length of the predicted queue will not extend to the bottom of the off-ramp, or the nose of the diverge slip.

The R126 Hearse Road will increase from 90.6% in the Do Minimum scenario to 106.3% in the Do Something scenario. The R132 Swords Road Southbound is expected to reach capacity in the Do Something Scenario, however the predicted queues do not reach as far back as the next junction. R132 Northbound is predicted to operate within capacity. Although the R132 Swords Road Southbound and R126 Hearse Road are predicted to experience a high degree of saturation during the AM peak hour, it is also expected that these will operate within acceptable saturation and queueing levels during the rest of the day.

The Lissenhall Junction (South) is predicted to operate within capacity overall under both the 2035 Do Minimum and 2035 Do Something PM peak hour scenarios. With the addition of the Park & Ride traffic, under the 2035 Do Something PM peak hour scenario, the M1 Northbound Off Ramp arm of the south junction is predicted to operate within its practical capacity. The M1 Northbound Off Ramp will decrease from 84.5% in the Do Minimum scenario to 77.8% in the Do Something scenario. This will result in queues decreasing from 15 PCU in the Do Minimum to 14 PCU (maximum 81m) in the Do Something.

The Lissenhall Junction (North) is predicted to operate within capacity overall under the 2035 Do Minimum PM peak hour scenario. The M1 Southbound Off Ramp approaches its practical capacity in the 2035 Do Something PM peak hour scenario, increasing from 77.4% in the Do Minimum scenario to 99.9% in the Do Something scenario. The queue in the Do Something scenario will be approximately 157m in length across two lanes. The length of the predicted queue will not extend to the bottom of the off-ramp, or the nose of the diverge slip.

The results show that the proposed Park and Ride accesses are predicted to operate within capacity during the AM peak hour 2035 Operational Phase. In the PM peak hour, the North Access Road exceeds practical capacity. Overall queue of 35 PCU (202m) is predicted on the R132 Southbound approach to the north junction, during the Weekday AM peak hour. The left entry lane from the new Park & Ride link road into the Park & Ride is predicted to experience a queue of 14 PCU (79m).

Due to the level of departures from the Park & Ride, during the PM peak period, eastbound queue of 57 PCU (324m) is predicted on the new link road between the P&R entrance and the R132 Swords Road.

Estuary Roundabout is located in close proximity to the proposed station and Park and Ride. An assessment of the ERM 2035 baseline flows against the base plus operational development flows confirm that there is no predicted impact on this junction during the Do Something scenarios.

An assessment of the cumulative impact of the Project and the R132 Connectivity Project has been undertaken, with modelling results presented in the Estuary TTA (Appendix A9.2). In 2035, the results show that although the Estuary Junction would still operate above capacity during the 2035 AM peak

hour, the introduction of the Project will result in reduced vehicular traffic on the road network, and overall improvement in operation of the junction. At Seatown Junction, the results show a minor reduction in practical reserve capacity in the overall junction performance in the AM peak with the Project in operation, with the practical reserve capacity reducing by 0.8 percentage points. At Malahide Junction, the results show improvements in the overall junction performance in the AM peak with the Project in operation, with the practical reserve capacity improving by 49.3 percentage points.

The Estuary TTA (Appendix A9.2) also presents the results for the 2050 Operational Phase scenarios.

AZ1 Northern Section

In AZ1 Northern Section in Scenario A 2035, there is a reduction of 2,547 car trips made when the proposed Project is in place over the 12hr peak period, with car mode share decreasing by 2 percentage points from the Do Minimum scenario. In 2050, there is a reduction of 3,795 car trips made in the Do Something scenario, reducing car mode share by 3 percentage points. In 2065, there is a reduction of 4,214 car trips made in the Do Something scenario, reducing car mode share by 3 percentage points.

In Scenario B 2035, there is a reduction of 2,900 car trips made when the proposed Project is in place over the 12hr peak period, with car mode share decreasing by 2 percentage points from the Do Minimum scenario. In 2050, there is a reduction of 4,984 car trips made in the Do Something scenario, reducing car mode share by 4 percentage points. In 2065, there is a reduction of 3,657 car trips made in the Do Something scenario, reducing car mode share by 2 percentage points.

As with the increase in public transport (including the Project) mode share, the zones around Swords see a corresponding reduction in car mode share, with reductions of up to 10 percentage points in this area. The wider Swords area, such as the Drynam Hall residential area, sees reductions of up to 5 percentage points in car mode share in the Operational Phase.

The future street level layout at Fosterstown Station as part of the proposed Project provides for a Kiss and Ride drop-off area to the east of the station entrance, to be accessed via the R125 Airside Retail Park, with an estimated usage of two drop-off passengers per train. The drop-off area will integrate with the future public realm between the future station and Airside Retail Park. The results of the modelling work also indicate that there will be a reduction of between 2,500 and 5,000 AADT along the R132 Swords Bypass in Scenario A 2035, when the proposed Project is operational, resulting in a long-term, Moderate, positive impact on the road network in the area.

Further details of traffic impacts during the Operational Phase are contained within the station specific TTA (Appendix A9.2). Table 9.124 presents a summary of the impact on the road network in the Operational Phase in AZ1.

Table 9.124: Summary of Operational Impact on Road Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
M1 (North of Park and Ride) – Scenario A	< -5,000 in AADT in all years	Very High (+/- >5,000 from baseline)	Low- Motorway	Long-term, Significant, Positive
M1 (North of Park and Ride) – Scenario B	-500 < -250 AADT in 2065	Medium (+/- 100<500 AADT from baseline)	Low- Motorway	Long-term, Slight, Positive
Estuary Roundabout	Negligible Impact on M1 traffic	Negligible	Low - Motorway	Long-term Imperceptible Negative
East of R132 Swords Bypass	Car mode share decreases by	Low (+/-1% to 10% from baseline)	Medium- Regional Road Network	Long-term Slight Positive

Link	Description	Magnitude	Sensitivity	Significance of Impact
	10 percentage points- both scenarios			
West of R132 Swords Bypass	Car mode share decreases by 5 percentage points – both scenarios	Low (+/-1% to 10% from baseline)	Medium- Regional Road Network	Long-term Slight Positive
R132 Swords Bypass (At Swords Central)	-5,000 <-2,500 AADT – Scenario A 2035	High (+/- >2,500 AADT from baseline)	Medium- Regional Road Network	Long-term Moderate Positive
R132 Swords Bypass (At Swords Central	-1,000 < -500 AADT- Scenario B 2035	Medium (+/- 500 < 2,500 AADT from baseline)	Medium- Regional Road Network	Long-term Moderate Positive
River Valley area	Car mode share decreases by 5 percentage points – both scenarios	Low (+/-1% to 10% from baseline)	Medium- Regional Road Network	Long-term Slight Positive
R132 Swords Bypass at Fosterstown Station	< -5,000 in AADT in Scenario A 2035	High (+/-> 2,500 AADT from baseline)	Medium- Regional Road Network	Long-term Moderate Positive
R132 Swords Bypass at Fosterstown Station	-1,000 < -500 AADT- Scenario B 2035	Medium (+/- 500 < 2,500 AADT from baseline)	Medium- Regional Road Network	Long-term Moderate Positive

9.6.2.2.1.3 Pedestrian Operational Impact Assessment

At Estuary Station, pedestrian access to the site will be via controlled pedestrian crossings on the new junctions on the R132 and SWDR. A pedestrian/cycle underpass will also be provided where the proposed Project railway alignment crosses Ennis Lane. This underpass will maintain the pedestrian and cycling connectivity between Ennis Lane to the west and Balheary Park to the south-east. At Seatown Station, the proposed Project will use the improved pedestrian facilities provided by the R132 Connectivity Project to provide enhanced access to the station. Swords Central Station and the Swords Pavillions Shopping Centre will be linked with a new pedestrian crossing associated with the proposed Project, providing public access to both sides of the R132. The new pedestrian crossing will require alterations to the existing left-in-left-out junction to the Pavillions Shopping Centre. At Fosterstown Station, the proposed Project design was cognizant of the planned development on the west side of the R132 Swords Bypass at this location within the Fosterstown LAP land bank. To ensure safe passenger of pedestrians and cyclists wishing to use the station from the Swords area, a new pedestrian crossing across the R132 Swords Bypass will provide access to the station.

Figure 9.42 and Figure 9.43 present the passenger origins and destinations within the 5, 10 and 15 minute walking isochrones from each of the stations. These figures are utilising the existing pedestrian network, and therefore do not reflect the proposed changes as part of the development of the Fosterstown strategic housing development area to the north-west of the station. When this is complete, the 5 minute walking isochrone from Fosterstown Station will extend to include this area.

The main origins of passengers in this section are the residential areas to the west of the R132 Swords Bypass and the Seatown residential area. The main destinations for disembarking passengers in the AM peak are the Pavilions Shopping Centre and the Main Street at the west of the stations, which concentrates many shops, restaurants and banks. Figure 9.42 illustrates that a large proportion of passengers using Fosterstown Station will travel from the Boroimhe and Ridgewood residential areas situated to the west of the station.

A pedestrian comfort assessment has been undertaken to assess the impact of the proposed Project on the comfort of the footway provisions, following the increased volumes of pedestrians on the network in the Design Years. The Scenario A 2050 AM peak hour scenario has been assessed, with the Scenario A 2065 worst-case scenario also presented (Figure 9.46 to Figure 9.49). Scenario B has not been assessed as the pedestrian numbers will be below those of Scenario A, and therefore no alternative significant impacts are anticipated.

As the stations lie within FCC, the guidance of DCC does not apply, however TfL Pedestrian Comfort Level assessments have been carried out utilising the predicted pedestrian demand. The assessment finds that all footway provisions around Seatown Station are deemed 'Comfortable' in both 2050 and 2065. This is a Long-term Significant Positive Impact on the R132 which is deemed 'Uncomfortable' in the Baseline scenario due to the insufficient width of existing provisions.

In the 2050 AM peak hour, the assessment indicates that the R106 West and Dublin Road are deemed 'Comfortable'. Whilst the R132 Swords Bypass and Drynam Road have an 'Acceptable' pedestrian comfort level, the R125 has an 'Uncomfortable' pedestrian comfort level due to the insufficient width of the footway, which is present on one side of the road only. This is no change from the Baseline scenario and therefore is not an impact of the Project. The 2065 assessment shows no change from the 2050 results.

In Scenario A, the assessment finds that most footway provisions around Fosterstown Station are deemed 'Comfortable' for pedestrians, however the R132 Swords Bypass at Fosterstown Station is deemed 'Acceptable'. In the Baseline scenario this is considered 'Comfortable', and therefore the Project has a Long-term Moderate Negative impact on footways at this location. The L2300 Boroimhe Road is considered 'Uncomfortable', which is a Long-term Significant Negative impact when compared to the 'Comfortable' conditions of the Baseline scenario. The same results can be seen in Scenario A 2065, resulting in a negative impact in both the design and Future Year scenarios. Possible mitigation measures for these significant impacts includes possible reallocation of space, as well as the consideration of the placement of street furniture to maximise available width. Reallocation of the current grass verges at this location would allow for an increase of total footway width to 4m, which would give an 'Acceptable' comfort level.

As noted in 9.4.8.2.1.2, Fosterstown Station is the only station along the alignment which has a higher AM passenger demand in Scenario B 2065 than in Scenario A 2065 (there is a 12% increase in Scenario B). To ensure no significant impacts have been missed in the assessment, a pedestrian comfort assessment of the Scenario B 2065 demand has been undertaken at Fosterstown station only. The assessment finds that the R132 Swords Bypass in the vicinity of the Fosterstown station has an 'Unacceptable' comfort level (PCL D), and therefore this is a long-term, Significant, negative impact of the Project in comparison with the baseline conditions. The L2300 Boroimhe Road also has an 'Unacceptable' comfort level, however this is the same in the Scenario A. Their proximity to Airside Retail Park also increases the sensitivity of the receptor, increasing the overall significance of the impact.

However, the pedestrian assessment at this location does not take into consideration the future footway network that may be present when the Fosterstown masterplan lands are developed, which may reduce the severity of the impact on the R132 Swords Bypass and L2300 Boroimhe Road. Possible mitigation measures to improve the pedestrian comfort level in this area have been identified in Section 9.7.2.

Table 9.125 presents a summary of the impact on the pedestrian network in the AZ1 section during the Operational Phase.

Table 9.125: Summary of Operational Impact on Pedestrian Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Links around Seatown Station	'Comfortable' pedestrian comfort level - Scenario A	High- (PCL A)	High- Proximity to Swords Pavillions	Long-term Significant Positive
R132 Swords Bypass near Swords Central	'Acceptable pedestrian comfort level – Scenario A	Medium (PCL B)	High- Proximity to Swords Pavillions	Long-term Slight Negative – but an improvement from baseline
Other links around Swords Central	'Comfortable' pedestrian comfort level – Scenario A	Low (PCL A)	High- Proximity to Swords Pavillions	Long-term Slight Positive
R132 Swords Bypass at Fosterstown (Scenario A)	'Acceptable pedestrian comfort level – Scenario A	Medium (PCL C)	High- Proximity to Swords Pavillions	Long-term Moderate Negative
R132 Swords Bypass at Fosterstown (Scenario B)	'Acceptable pedestrian comfort level – Scenario A	High (PCL D)	High- Proximity to Swords Pavillions	Long-term Significant Negative
L2300 Boroimhe Road	'Uncomfortable' pedestrian comfort level – Scenario A and Scenario B	High (PCL D)	High- Proximity to Airside Retail Park	Long-term Significant Negative
R125 Airside Retail Park /L2305 Nevinstown Lane	'Comfortable' pedestrian comfort level – Scenario A	Negligible (PCL A)	High- Proximity to Airside Retail Park	Long-term Imperceptible Impact

9.6.2.2.1.4 Cycle Operational Impact Assessment

Cycle lanes will be provided on both sides of the R132 Swords Bypass as part of the proposed Project. Crossing facilities are also provided on the R132 Swords Bypass. This has a significant positive impact on the Quality of Service for cyclists in the area, progressing from a Level C to a Level A Quality of Service (QoS) at Estuary Station. The R132 Swords Bypass in the vicinity of Seatown Station and Swords Central will maintain a Level B QoS, with the R132 in the vicinity of Fosterstown Station will progress from a Level C to Level B QoS. There will also be a two-way cycle lane to the east of the proposed station, with linkages to the proposed bike parking and Park and Ride facility.

A methodology has been applied to determine the potential demand for cycle parking at each of the stations. This methodology utilises the number of boarding and alighting passengers, the distance of origin/destinations from the station, and the location of the station, as detailed in Chapter 6 (MetroLink Operations and Maintenance). The passenger demand from an earlier Opening Year has been utilised to determine the potential cycle demand in the Opening Year, and in the Opening Year +5 Years.

This approach has informed the design and the number of cycle parking spaces provided at each station. Other factors such as the availability of land, potential future land-uses and parking supply and the location of the station have also been taken into consideration by the design team in determining the quantum of cycle parking spaces provided. For each station, the following cycle spaces have been proposed:

- Estuary Station, a total of 254 cycle spaces-located next to the station;

- Seatown Station, 480 cycle spaces are proposed- a landscaped plaza is located in front of the entrance to the station with a building for bicycle storage offset to the east side of the plaza with a provision for 240 bicycles. A further 240 bicycles spaces will be provided located along the landscaped boundary with the R132 and on the east side of the station building;
- Swords Central Station, 942 cycle spaces are proposed- a bicycle storage building is proposed, offset and slightly in front of the plaza on one of the access routes to the station, which is designed to accommodate 471 bicycles. A further 471 spaces will be provided around the station; and
- Fosterstown Station, 422 cycle spaces are proposed- a bicycle storage building will be provided in front of the station building, separated by the plaza and angled to reduce its dominance overlooking the plaza ad station entrance. The building will provide covered storage for 211 bicycles with a further 211 spaces provided at locations around the station but set back from pedestrian desire lines.

Table 9.126 presents a summary of the impact on the cycle network in AZ1 during the Operational Phase.

Table 9.126: Summary of Operational Impact on Cycle Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
R132 Swords Bypass at Estuary	Provision of two-way cycle lane and crossing facilities	High (Level A Quality of Service)	High (High Volume of cyclists accessing station/P&R)	Long-term Significant Positive
R132 Swords Bypass at Seatown	One-way cycle lanes on both sides of R132	High (Change from no provision to Level B QOS)	High	Long-term Very Significant Positive
R132 Swords Bypass at Swords Central	2m one-way cycle lane on both sides of R132.	Low (previous shared bus lane Level B, to designated infrastructure Level B	High- Proximity to Swords Town Centre	Long-term Moderate Positive
R132 Swords Bypass at Fosterstown	Level B Quality of Service (previously shared bus lane Level B)	Negligible (No change from baseline)	High- Proximity to Swords Town Centre	Long-term Slight Positive Impact

9.6.2.2.1.5 Parking and Loading Operational Impact Assessment

In the Operational Phase of the Project, there will be 3,000 parking spaces available in the Park and Ride Facility at Estuary Station.

The presence of the Park and Ride Facility will slightly reduce demand at other park and ride locations across Dublin. No on-street parking and loading facilities are being removed as a result of the proposed Project.

There will be no impact to parking and loading during the Operational Phase of the Project at Seatown, Swords Central or Fosterstown Stations.

Table 9.127 presents a summary of the impact on the parking network in AZ1 during the Operational Phase.

Table 9.127: Summary of Operational Impact on Parking Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Estuary Station	Provision of 3,000 space Park and Ride facility-	Very High (from no provisions in baseline)	High- Limited parking in area, lack of PT services so many are car dependent	Long-term Profound Positive Impact

9.6.2.2.2 AZ2 Airport Section

This section of the chapter presents a description of the impacts on the AZ2 Airport Section (DANP to DASP) during the Operational Phase. This station within this section is:

- Dublin Airport Station.

Further details on the Operational Phase can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Dublin Airport Station has the highest volume of passenger demand across all years in both scenarios. Across all years, Scenario B presents a slightly higher volume of boarding and alighting passengers at Dublin Airport station, reaching a maximum total of approximately 98,600 passengers in Scenario B 2065, whereas Scenario A 2065 reaches a maximum of approximately 97,800 total passengers during the 12 hour period.

Diagram 9.55 presents the 12hr peak period total trip demand in the AZ2 Airport Section in Scenario A. The total trip demand increases by 24% between 2035 and 2050 from 70,331 trips to 87,102 trips. There is 14% increase in trips from 2050 to 2065, reaching a total trip demand of 99,310 trips.

Total PT mode share increases by 8 percentage points from 36% Do Minimum to 44% Do Something in 2035. In 2050, there is also an increase of 8 percentage points from 45% in the Do Minimum to 53% in the Do Something. In 2065, the total PT mode share increases by 9 percentage points from 50% in the Do Minimum to 59% in the Do Something.

In 2035, Car mode share decreases by 7 percentage points, from 62% in the Do Minimum to 55% in the Do Something. In 2050, Car mode share has a reduction of 7 percentage points from 53% in the Do Minimum to 46% in the Do Something. In 2065, Car mode share decreases by 8 percentage points, from 48% in the Do Minimum to 40% in the Do Something.

Active Modes mode share (which includes end-to-end Walking and Cycling trips, but does not include interchange with the Project) reduces by up to 1 percentage points. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ2 Airport Section.

Diagram 9.54: Scenario A 12hr Peak Period Total Trip Demand – AZ2 Airport Section

Diagram 9.56 presents the 12hr peak period total trip demand in the AZ2 Airport Section in Scenario B. The total trip demand increases by 23% between 2035 and 2050 from 70,651 trips to 86,601 trips. There is 15% increase in trips from 2050 to 2065, reaching a total trip demand of 99,372 trips.

Total PT mode share increases by 6 percentage points from 39% Do Minimum to 45% Do Something in 2035. In 2050, there is also an increase of 8 percentage points from 49% in the Do Minimum to 57% in the Do Something. In 2065, the total PT mode share increases by 8 percentage points from 52% in the Do Minimum to 60% in the Do Something.

In 2035 Car mode share decreases by 5% percentage points, from 59% in the Do Minimum to 54% in the 2035 Do Something. In 2050 Car mode share decreases by 8 percentage points from 49% in the Do Minimum to 41% in the Do Something. In 2065, Car mode share decreases by 7 percentage points, from 45% in the Do Minimum to 38% in the Do Something.

Active Modes mode share (which includes Walking and Cycling) reduces by up to 1 percentage point across the forecast years. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ2 Airport Section.

Diagram 9.55: Scenario B 12hr Peak Period Total Trip Demand -AZ2 Airport Section

Table 9.128 presents the percentage modal split for Terminal Workers, Office Workers, and Passengers at Dublin Airport in both the AM and PM peak hours in Scenario B 2035 (Scenario B Opening Year has higher boarding and alighting figures than Scenario A Opening Year so analysis was completed for Scenario B only). The model indicates that car has the highest mode share for workers in the office lands in the AM peak hour, whereas Terminal workers primarily travel by public transport. In the PM peak hour, Road has the highest mode share for both Terminal Workers and Office workers. The majority of Passengers travel by public transport in the AM peak hour, however in the PM peak hour, Road holds the highest mode share.

Table 9.128: Dublin Airport Modal Splits - Workers and Passengers Scenario B 2035

Purpose	Mode	AM Peak Hour			PM Peak Hour		
		Airport Origin	Airport Destination	Total	Airport Origin	Airport Destination	Total
Workers Terminal	Cycle	0.0%	0.7%	0.4%	0.8%	0.0%	0.4%
	Walk	0.0%	0.6%	0.3%	0.6%	0.2%	0.4%
	PT (including Project)	54.1%	51.3%	52.7%	45.3%	44.0%	44.6%
	Road	45.6%	47.5%	46.5%	53.3%	55.8%	54.6%
Workers Offices (North and East)	Cycle	1.1%	2.7%	1.9%	3.1%	0.9%	2.0%
	Walk	9.3%	2.6%	5.9%	3.0%	8.5%	5.7%
	PT (including Project)	39.5%	28.4%	33.9%	28.4%	28.5%	28.5%
	Road	50.1%	66.4%	58.2%	65.4%	62.2%	63.8%
Total Workers	Cycle	24.9%	25.0%	25.0%	25.0%	25.0%	25.0%
	Walk	25.2%	25.5%	25.4%	25.6%	25.2%	25.4%
	PT (including Project)	27.5%	26.0%	26.8%	26.2%	27.3%	26.7%
	Road	23.9%	20.3%	22.1%	22.0%	23.4%	22.7%
Passengers	Cycle	0.0%	0.7%	0.4%	0.8%	0.0%	0.4%
	Walk	0.2%	0.6%	0.4%	0.6%	0.2%	0.4%
	PT (including Project)	54.1%	51.3%	52.7%	45.3%	44.0%	44.6%
	Road	45.6%	47.5%	46.5%	53.3%	55.8%	54.6%

Diagram 9.57 presents the change in mode share for Dublin Airport Flyers between the Do Minimum and Do Something scenarios in Scenario B 2035, 2050 and 2055 during the12hr period. Diagram 9.58 presents the change in mode share for Dublin Airport Workers for the same scenarios. For Flyers in 2035, Total PT (including the Project) mode share increases by 7 percentage points when the Project is in place, with the Project accounting for 43% of total mode share. In 2050, Total PT mode share increases by 10 percentage points, from 54% in the Do Minimum scenario, to 64% in the Do Something scenario, with the Project accounting for 56% of total mode share. In 2065, Total PT mode share increases from 59% in the Do Minimum scenario, to 66% in the Do Something scenario. The Project accounts for 59% of total mode share in this scenario. Car mode share sees the largest reduction in 2065, reducing from 41% in the Do Minimum scenario, to 33% in the Do Something.

For Workers, Total PT mode share increases from 22% in the Do Minimum scenario, to 32% in the Do Something scenario, with the Project accounting for 26% of total mode share. In 2050, Total PT mode share increases from 27% in the Do Minimum scenario, to 41% in the Do Something scenario, with the Project accounting for 33% of total mode share. In 2065, Total PT mode share increases from 30% in the Do Minimum scenario, to 42% in the Do Something scenario, with the Project accounting for 34% of total mode share. Car mode share has the largest percentage point reduction in 2050, reducing from 73% to 60%.

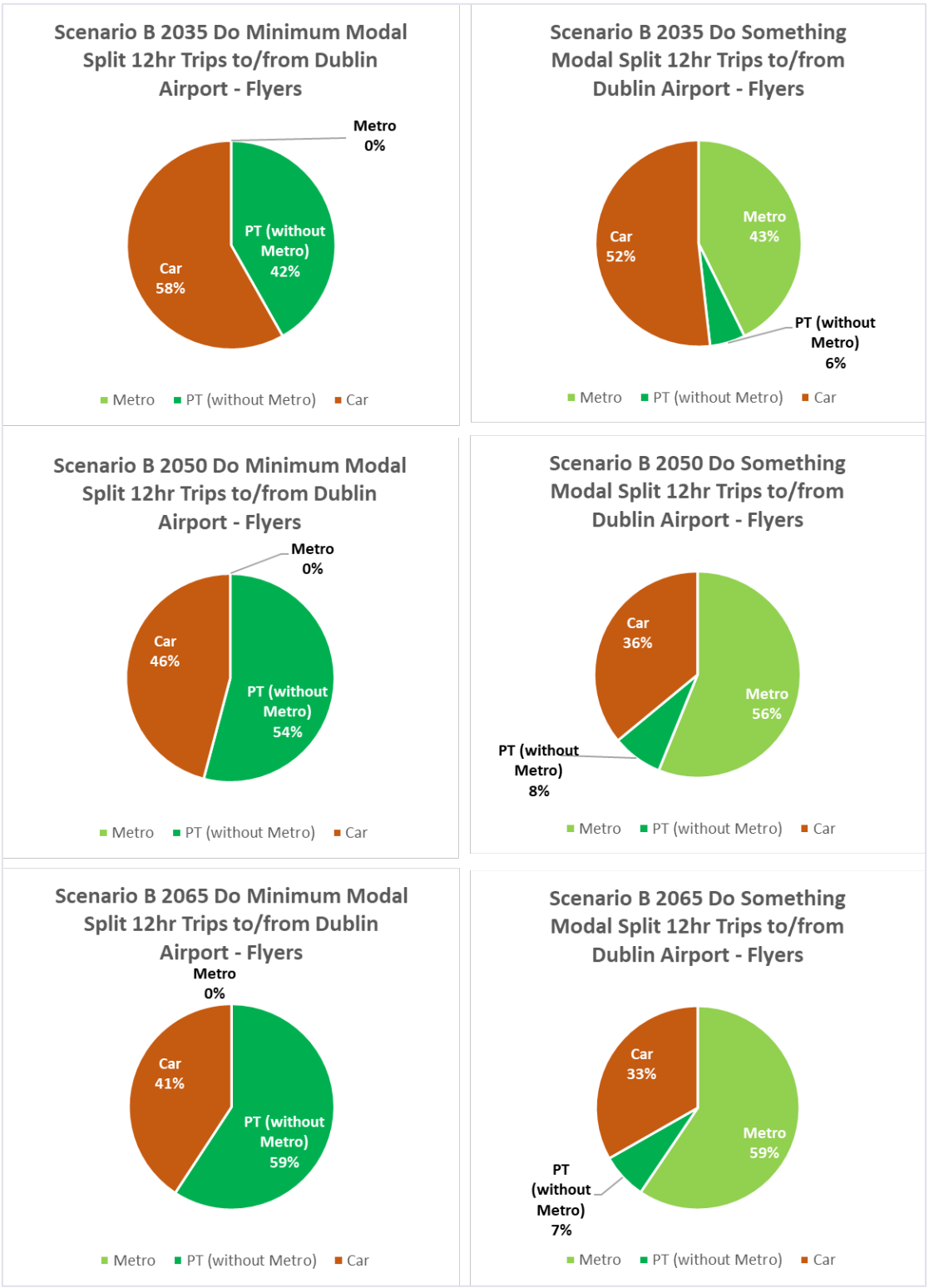

Diagram 9.56: Change in Mode Share for Airport Passengers- Scenario B

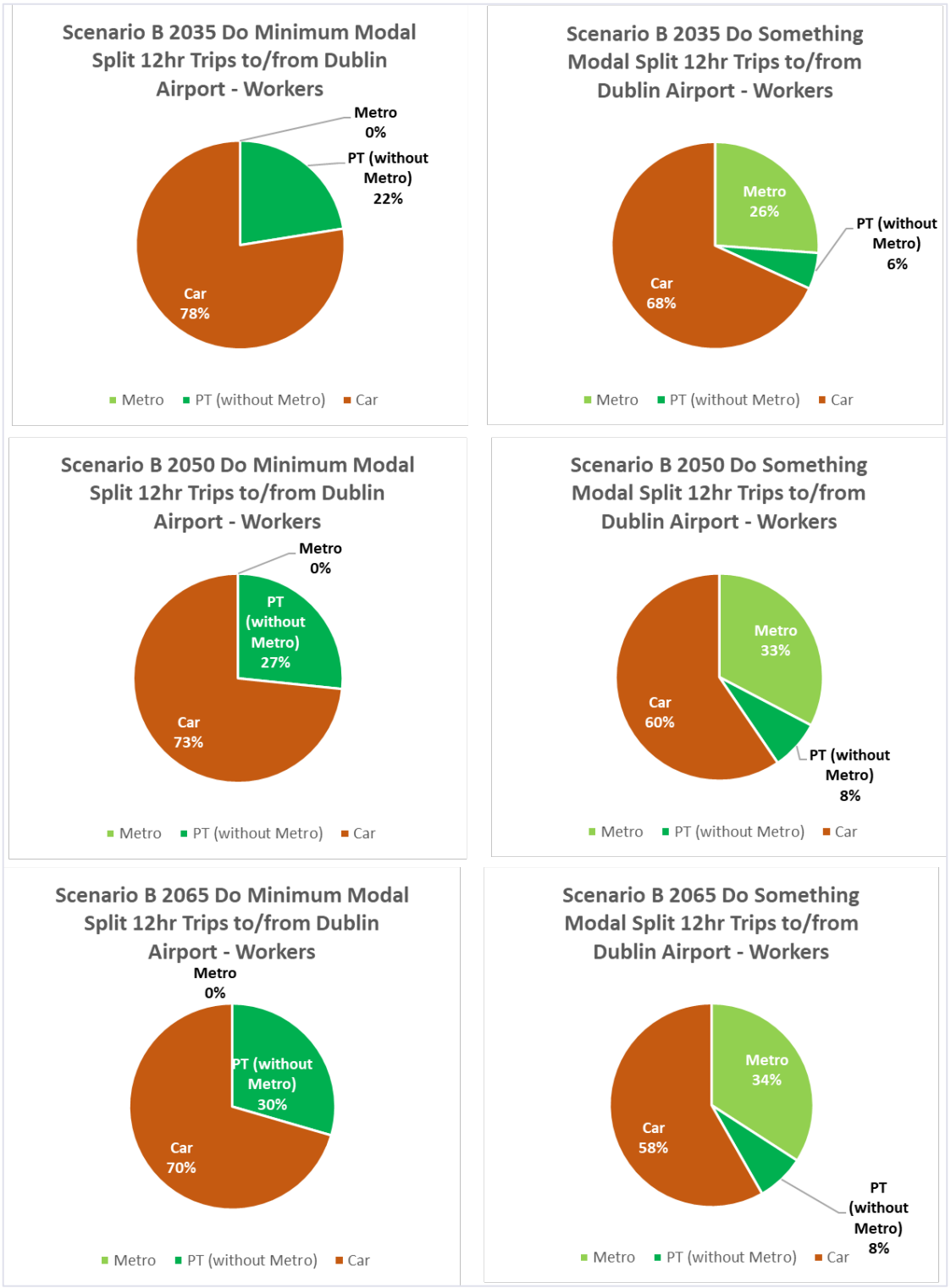

Diagram 9.57: Change in Mode Share for Airport Workers -Scenario B

9.6.2.2.2.1 Public Transport Operational Impact Assessment

The proposed street level layout of Dublin Airport will not impact on any nearby bus routes or stops during the Operational Phase.

In AZ2 Airport Section in Scenario A 2035, there are an additional 5,176 PT trips made when the proposed Project is in place over the 12hr peak period, with total PT mode share increasing by 7 percentage points from the Do Minimum scenario. In 2050, there are an additional 7,028 PT trips made in the Do Something scenario, increasing total PT mode share by 8 percentage points. In 2065, there are

an additional 8,988 PT trips made in the Do Something scenario, increasing total PT mode share by 9 percentage points.

In Scenario B 2035, there are an additional 3,997 PT trips made when the proposed Project is in place over the 12hr peak period, with total PT mode share increasing by 6 percentage points from the Do Minimum scenario. In 2050, there are an additional 6,966 PT trips made in the Do Something scenario, increasing total PT mode share by 8 percentage points. In 2065, there are an additional 7,599 PT trips made in the Do Something scenario, increasing total PT mode share by 8 percentage points.

Dublin Airport Flyers trips bus mode share decreases from 35% in the Scenario A 2035 Do Minimum scenario, to 6% in the Do Something scenario, with the Project representing 38 percentage points of the total 44% PT mode share in the Do Something scenario. In Scenario A 2050 bus mode share decreases from 42% in the Do Minimum to 6% in the Do Something scenario, with the Project accounting for 46 percentage points of the total 53% PT mode share in the Do Something.

Figure 9.14 to Figure 9.25 present the change in mode share between the Do Minimum and Do Something scenarios. PT (including the Project) mode share at Dublin Airport sees an increase of between 10 percentage points and 20 percentage points in 2065 during the AM period. This results in long-term, Significant, positive impacts on public transport mode share in the area.

In Scenario A 2035, 2050 and 2065 AM period, public transport journeys from Dublin Airport to areas outside of the M50 Motorway, including Blanchardstown, Sandyford and Tallaght will see savings times of between 9 and 28 minutes when the proposed project is in place. Public transport journeys from Dublin Airport to key Dublin City Centre locations such as O'Connell Street, St Stephen's Green and Trinity College will see significant time savings between 17 and 24 minutes across the 2035, 2050 and 2065 AM period. Public transport journeys from Dublin Airport to areas in north Dublin, such as Swords Pavilion and Swords East, will see savings of approximately 15 to 17 minutes in the 2035, 2050 and 2065 AM period.

In Scenario B 2035, 2050 and 2065 AM period, public transport journeys from Dublin Airport to areas outside of the M50 Motorway, including Blanchardstown, Sandyford and Tallaght will see savings times of between 10 and 32 minutes when the Project is in place. Public transport journeys from Dublin Airport to key Dublin City Centre locations such as O'Connell Street, St Stephen's Green and Trinity College will experience significant time savings between 14 and 27 minutes across the 2035, 2050 and 2065 AM period. Public transport journeys from Dublin Airport to areas in north Dublin, such as Swords Pavilion and Swords East, will see savings of approximately 10 to 12 minutes in the 2035, 2050 and 2065 AM period.

Figure 9.44 and Figure 9.45 present the difference in public transport journey times for journeys within 45 minutes. They also present the areas which are newly accessible by public transport in less than 45 minutes when the proposed Project is in place. The Finglas area sees savings of up to 30 minutes both to and from Dublin Airport, while locations along the M2 sees savings of up to 10 minutes for journeys from Dublin Airport. Areas between Dublin Airport and the M50 Motorway, and the Blanchardstown area will be newly accessible by public transport within 45 minutes for journeys both to and from Dublin Airport.

Table 9.129 presents a summary of the impact on the public transport network at Dublin Airport in the Operational Phase.

Table 9.129: Summary of Operational Impact on Public Transport Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Dublin Airport to Sandyford	PT journey time saving of approx. 25mins – both scenarios	High (+/- >25% from baseline)	High- Essential bus services to Dublin Airport	Long-term Significant Positive

Link	Description	Magnitude	Sensitivity	Significance of Impact
Dublin Airport to Dublin City Centre	PT journey time saving of approx. 14 mins	Medium- (+/- 10% to 25% from baseline)	High- Essential bus services to Dublin Airport	Long-term Moderate Positive
Dublin Airport to Dublin City Centre	PT journey time saving approx. 25mins	High (+/- >25% from baseline)	High- Essential bus services to Dublin Airport	Long-term Significant Positive

9.6.2.2.2.2 General Traffic Operational Impact Assessment

In AZ2 Airport Section in Scenario A 2035, there is a reduction of 4,635 car trips made when the Project is in place over the 12hr peak period, with car mode share decreasing by 7 percentage points from the Do Minimum scenario. In 2050, there is a reduction of 6,229 car trips made in the Do Something scenario, reducing car mode share by 7 percentage points. In 2065, there is a reduction of 7,867 car trips made in the Do Something scenario, reducing car mode share by 8 percentage points.

In Scenario B 2035, there is a reduction of 3,397 car trips made when the Project is in place over the 12hr peak period, with car mode share decreasing by 5 percentage points from the Do Minimum scenario. In 2050, there is a reduction of 6,174 car trips made in the Do Something scenario, reducing car mode share by 7 percentage points. In 2065, there is a reduction of 6,589 car trips made in the Do Something scenario, reducing car mode share by 7 percentage points.

In the zones around Dublin Airport, car mode share decreases by up to 20 percentage points in 2065 when the proposed Project is in place during the AM period. In the PM period, car mode share decreases by up to 20 percentage points in the zones at Dublin Airport, where the largest number of the proposed Project boarding and alighting passengers occur. The results from the ERM model clearly indicate a reduction in car travel to and from the surrounding catchment area of Dublin Airport Station.

This results in a long-term, Significant, positive impact on Car mode share at Dublin Airport.

In the Scenario A AM Peak hour in all forecast years, road travel time savings of up to 250s (~4mins) can be seen on the internal road network at Dublin Airport. In Scenario B 2050, road travel time savings of up to 250s (~4mins) can be seen on the Corballis Road North and T2 Departures Road. In Scenario B 2065, the internal road network at Dublin Airport sees road travel time savings of up to 1,000s (~16mins) on the Arrivals Road to the south of Terminal 1, with the T2 Departures Road sees road travel time savings of up to 250s (~4mins).

The internal road network at Dublin Airport sees reductions of up to 5,000 AADT in Scenario A 2035, with reductions of up to 2,500 AADT in Scenario B 2035.

The proposed access road to the North Portal MetroLink Grid Connections sub station will tie into the existing Naul Road as a T-junction. Limited volumes of traffic are anticipated to utilise this access road during the Operational Phase. As a result, the proposed Project will have a Permanent Negligible Negative impact on the road network at this location.

Table 9.130 presents a summary of the impact on the road network at Dublin Airport in the Operational Phase.

Table 9.130: General Traffic Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Dublin Airport	Car Mode Share reduces by 20 percentage points – both scenarios	High (+/- >20% from baseline)	High (Airport is sensitive receptor)	Long-term Significant Positive
T2 Departures	Road travel time savings of up to 250s – both	Medium (+/- 100 < 500s road travel	High – (Airport is sensitive receptor)	Long-term Moderate Positive

Link	Description	Magnitude	Sensitivity	Significance of Impact
Road	scenarios	time from baseline)		
Arrivals Road	-1,000 < -500s change in road travel time- Scenario B 2065	High (+/- 500s < 2,500 change in road travel time)	High – (Airport is sensitive receptor)	Long-term Significant Positive
Dublin Airport	-5,000 < -2,500 AADT – Scenario A 2035	Very High (+/- >2,500 AADT from baseline)	High – (Airport is sensitive receptor)	Long-term Very Significant Positive
Dublin Airport	-2,500 < -1,000 AADT- Scenario B 2035	High (+/- 500 < 2,500 AADT from baseline)	High – (Airport is sensitive receptor)	Long-term Significant Positive

9.6.2.2.2.3 Pedestrian Operational Impact Assessment

An assessment of the impact of the changes in pedestrian movements within Dublin Airport due to the proposed Project has been undertaken. The assessment work utilised static analysis tools of the TfL Pedestrian Comfort Analysis. Further details of the assessment work are contained in the Dublin Airport Station Specific TTA (Appendix A9.2).

The results of the pedestrian assessment, shown in Table 9.131 indicate that in the Opening Year AM peak period all footways will experience 'Comfortable' conditions during the peak hour flow, with the exception of the footway from the station to Terminal 1, which will have an 'Acceptable' level of comfort during peak flows. During periods of maximum activity, all links will experience sufficient levels of comfort, however they may need reassessed in the future.

As such, there will be a long-term, Moderate, Positive impact on pedestrians at this location due to the disaggregation of boarding and alighting passengers onto separate footways travelling to and from Terminal 1.

Table 9.131: Footway Assessment Results - Opening Year AM peak period

Footway Section	PCL (Peak Hour Flow)	Impact	PCL (Av. Maximum Activity)	Impact
From Terminal 1 Boarding the Project	A	The footway on this site should be comfortable for its intended use at most times. However, you may need to reassess the site in future.	B	This level of comfort is appropriate for periods of additional stress for all Area Types
Alighting the Project to Terminal 1	B+	The footway on this site should be comfortable for its intended use at most times. However, you may need to reassess the site in future.	C	This level of comfort is appropriate for periods of additional stress in Office and Retail and Transport Interchange sites.
Terminal 2 Boarding and Alighting	A-	The footway on this site should be comfortable for its intended use at most times. However, you may need to reassess the site in future.	C+	This level of comfort is appropriate for periods of additional stress in Office and Retail and Transport Interchange sites.
Office Lands B&A	A-	The footway on this site should be comfortable for its intended use at most times. However, you may	B-	This level of comfort is appropriate for periods of additional stress for all Area Types

		need to reassess the site in future.		

Table 9.132: Pedestrian Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
Terminal 1 Boarding Footway, Terminal 2 Footway and Office lands footway	Comfortable during peak hour flow	Medium (From acceptable to comfortable as separate route for those alighting from Project to Terminal)	Medium (High pedestrian demand however nature of airports as busy)	Long-term Moderate Positive
Terminal 1 Alighting Footway	Sufficient to accommodate demand	Negligible- No change from baseline	Medium (High pedestrian demand however nature of airports as busy))	Long-term Imperceptible Negative
All footways during periods of Maximum activity	Sufficient to accommodate demand	Negligible- No change from baseline	Medium (High pedestrian demand however nature of airports as busy)	Long-term Imperceptible Negative

In recognition of the potentially complex routing and road crossing behaviour at this site, a VisWalk model was also produced for the area surrounding Dublin Airport station. The modelled layout includes the main roads in Dublin Airport, as well as the associated major signalised junctions and crossings. As well as these aspects, it also includes the numerous crossings within Dublin Airport that connect bus termini and terminals, as well as surrounding areas. The results demonstrate that the network operates with an acceptable level of service in the majority of locations in the Scenario B 2035 AM peak hour, as shown in Diagram 9.59. Some delay at specific locations on the network, such as the waiting areas at signalised pedestrian crossings, is likely due to the high pedestrian demand and it is considered that the overall level of service on the network is acceptable.

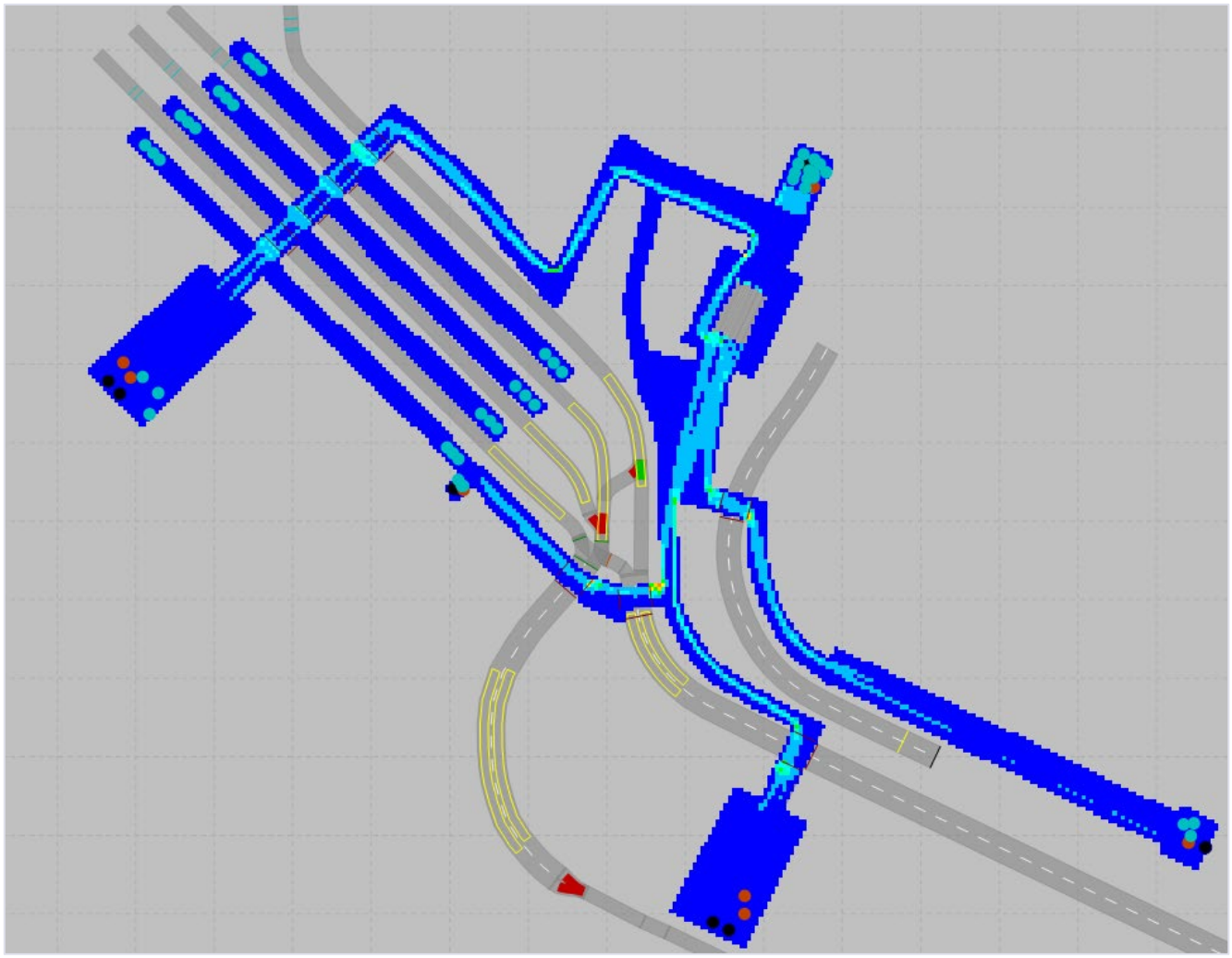

Diagram 9.58: Dublin Airport Level of Service Scenario B 2035 AM peak hour

9.6.2.2.2.4 Cycle Operational Impact Assessment

The future station configuration will have a negligible impact on the Quality of Service of the cycle network within Dublin Airport, maintaining a Level B QoS.

Given the nature of the station as an airport the methodology utilised for determining cycle demand at the other stations would not be applicable at Dublin Airport.

A provision of 72 cycle spaces has been provided at the station, this will accommodate workers and passenger that may cycle to the station to travel into Dublin City Centre or to Swords. This parking provision will link to the existing cycle network around the airport.

Table 9.133: Cycle Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
All	No changes to network-	-Negligible (Level B QoS)	-Low (due to nature of travel at airports)	Long-term Imperceptible Positive Impact

9.6.2.2.2.5 Parking and Loading Operational Impact Assessment

There will be a Permanent Slight impact to parking and loading during the Operational Phase of the Project as a result of the loss of spaces in the Terminal 2 Surface Car Park during the construction of the Dublin Airport Station. This closure is permanent as the site will function as the Dublin Airport Station

site. This is considered to be an impact of Low magnitude as this represents approximately 1% of the total available spaces (Long-term and short-term parking combined 22,600 spaces), this is not considered a significant loss. The sensitivity of the receiving environment is considered to be Medium as the demand for airport car parking will reduce when the Project is Operational, as evident by the reduction in car trips noted in section 9.6.2.2.2.2 AZ2 Airport Section- General Traffic Operational Phase Assessment.

As discussed in section 9.5.2.2.5.1 Future Receiving Environment (AZ2 Baseline Parking and Loading), DAA has received planning approval for the creation of a paid drop-off area for both Terminal 1 and Terminal 2. The proposed exit from the paid drop-off facility involves changes to the existing road layout and the relocation of a pedestrian crossing. The use of the Terminal 2 Surface Car Park, and road configurations, tolling infrastructure and all development at the area adjoining the south-west corner of the Terminal 2 multi-story car park is 'permitted on a temporary basis only and shall cease within five years or the final grant of permission or otherwise where required for purposes of MetroLink.' Therefore, during the operational phase of the proposed Project, this drop-off facility will be removed. As the facility is permitted on a temporary basis only and has a condition to cease when the area is required by the proposed Project, this is not deemed an impact on parking loading as a direct result of the Project.

Table 9.134: Parking and Loading Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
-All	Loss of parking spaces with the removal of T2 surface car park	Low- in relation to proportion of parking available in area	Medium- Demand for airport parking will reduce with the provision of the Project offering an attractive alternative to car trips	Permanent, Slight, Negative

9.6.2.2.3 AZ3 Dardistown and M50 Viaduct Section

This section of the chapter presents a description of the impact on the public transport, road, pedestrian, cycle and parking network in the AZ3 Dardistown Section (DASP to Northwood). As Dardistown Depot is a proposed future station and will not be operational in the Opening or forecast years, its impact has not been assessed. Further details on the operation of Dardistown Depot can found in Chapter 6 (MetroLink Operations and Maintenance). The station in this section is:

- Northwood Station

Further details on the operational impacts can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

To the north of Northwood Station, Dardistown Depot will house the facilities required for the maintenance and operation of the proposed Project and its rolling stock. It will be located near the future Dardistown Station, however there will be no public passenger access to Dardistown station.

The proposed access layout at Dardistown Depot is illustrated in Diagram 9.60. The future street level layout for Dardistown as part of the proposed Project provides for two new priority junctions, including the existing junction off the R108 Ballymun Road, and the new depot main vehicular access off the Old Airport Road, to facilitate access to and from the depot for staff. As the station is not open for general public usage, the only traffic that will utilise the new junctions will be from the staff or business related to the proposed Dardistown Depot. In total, it is estimated that there will be 100 staff members at the depot and the junctions have been designed to accommodate the associated traffic volumes and the likely vehicles that will service the depot.

A secure pedestrian access will be provided between the Depot and Dardistown Station (for staff only). This will comprise an underpass from Dardistown Station, with a lift in order to be fully accessible, with turnstiles and full height accessible gates before entering the depot, and a footpath leading to the

Permanent Way Building next to the main offices. A secondary access for emergency use is provided at the south-western corner of the depot site, with access from the R108. Further detail on Dardistown Depot can be found in Chapter 4 (Description of the MetroLink Project).

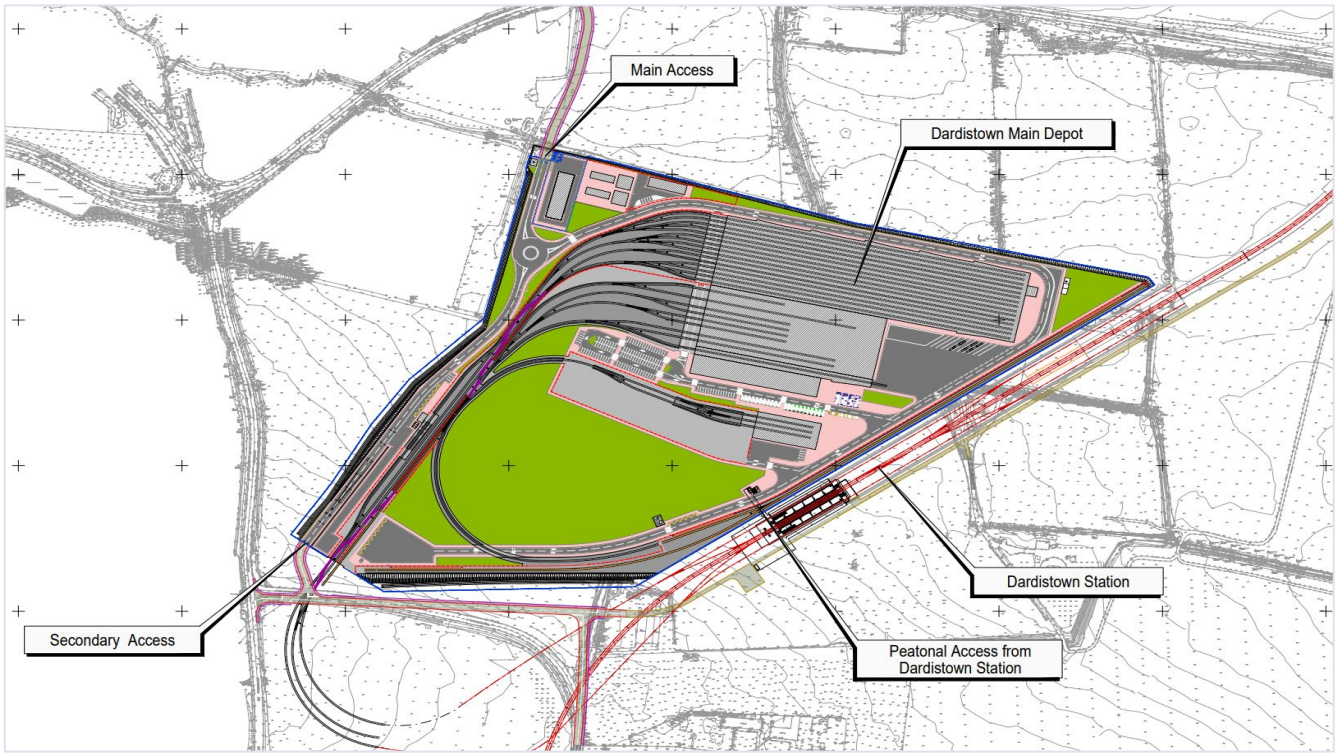

Diagram 9.59: Proposed Access Layout at Dardistown Depot

Diagram 9.61 presents the 12hr peak period total trip demand in the AZ3 Dardistown to Northwood Section in Scenario A. The total trip demand increases by 21% between 2035 and 2050 from 13,418 trips to 16,248 trips. There is 17% increase in trips from 2050 to 2065, reaching a total trip demand of 19,031 trips.

Total PT mode share increases by 5 percentage points from 14% Do Minimum to 19% Do Something in 2035. In 2050, there is also an increase of 5 percentage points from 15% in the Do Minimum to 20% in the Do Something. In 2065, the total PT mode share increases by 6 percentage points from 15% in the Do Minimum to 21% in the Do Something.

There is a 1 percentage point reduction in Car mode share between the Do Minimum and Do Something scenario in in each of the forecast years, reducing from 58% to 57% in 2035, from 55% to 54% in 2050, and from 52% to 51% in 2065.

Active Modes mode share (which includes end-to-end Walking and Cycling trips, but does not include interchange with the Project) reduces by 4-5 percentage points across the forecast years. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ3 Dardistown to Northwood Section.

Diagram 9.60: Scenario A 12hr Peak Period Total Trip Demand- AZ3 Dardistown to Northwood Section

Diagram 9.62 presents the 12hr peak period total trip demand in the AZ3 Dardistown to Northwood Section in Scenario B. The total trip demand increases by 20% between 2035 and 2050 from 13,428 trips to 16,167 trips. There is 17% increase in trips from 2050 to 2065, reaching a total trip demand of 18,984 trips.

Total PT mode share increases by 4 percentage points from 15% Do Minimum to 19% Do Something in 2035. In 2050, there is also an increase of 4 percentage points from 16% in the Do Minimum to 20% in the Do Something. In 2065, the total PT mode share increases by 5 percentage points from 16% in the Do Minimum to 21% in the Do Something.

There is a 0 percentage point decrease in Car mode share between the Do Minimum and Do Something scenario in 2035. In both 2050 and 2065 Car mode share reduces by 1 percentage point between the Do Minimum and Do Something scenarios, reducing from 54% to 53% in 2050, and from 52% to 51% in 2065.

Active Modes mode share (which includes Walking and Cycling) reduces by 3-4 percentage points across the forecast years. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ3 Dardistown to Northwood Section.

Diagram 9.61: Scenario B 12hr Peak Period Total Trip Demand – AZ3 Dardistown to Northwood Section

9.6.2.2.3.1 Public Transport Operational Impact Assessment

The future street level layout at Northwood Station as part of the proposed Project includes a bus lane on both the northbound and southbound sides of the R108 Ballymun Road within the Project Boundary. A pedestrian crossing is provided to the north and south of the entrance, to facilitate interchange between the bus network and the second station access on the southbound side of the R108 Ballymun Road.

In AZ3 Dardistown to Northwood Section in Scenario A 2035, there are an additional 608 PT trips made when the Project is in place over the 12hr peak period, with total PT mode share increasing by 5 percentage points from the Do Minimum scenario. In 2050, there are an additional 792 PT trips made in the Do Something scenario, increasing total PT mode share by 5 percentage points. In 2065, there are an additional 1,031 PT trips made in the Do Something scenario, increasing total PT mode share by 5 percentage points.

In Scenario B 2035, there are an additional 572 PT trips made when the proposed Project is in place over the 12hr peak period, with total PT mode share increasing by 4 percentage points from the Do Minimum scenario. In 2050, there are an additional 763 PT trips made in the Do Something scenario, increasing total PT mode share by 4 percentage points. In 2065, there are an additional 905 PT trips made in the Do Something scenario, increasing total PT mode share by 5 percentage points.

In the 2035 AM period in both scenarios, the zones surrounding Northwood Station see an increase in PT usage (including the Project) of up to 10 percentage points. In the 2065 scenario, these increases extend further along the M50 Motorway boundary north of the station, with an increased number of zones to the west of the station seeing increases in PT (including the proposed Project) mode share of up to 10 percentage points.

The residential area of Finglas to the west of the proposed Northwood Station sees savings of approximately 10 to 15 minutes for public transport journeys from Finglas to Sandyford in the Scenario A 2035 AM peak hour. This results in a reduction of between 14% and 17%. There is a saving of between 23 and 25 minutes from Finglas to Swords Pavillions across the forecast years in Scenario A, equating to approximately a 30% reduction. There is a saving of approximately 4-8 minutes for journeys from Finglas to St Stephen's Green in both the AM and PM peaks across the forecast years in Scenario A, with negligible reductions seen to Dublin City Centre locations in Scenario B.

These PT journey times savings present a long- term, Significant, positive impacts for public transport users in both Scenario A and Scenario B.

Table 9.135 presents a summary of the impact on the public transport network in AZ3 during the Operational Phase.

Table 9.135: Public Transport Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
East and West of station	5-10 percentage point increase in PT (including Project) mode share – both scenarios	Low (+/- 1% to 10% from baseline)	Medium- Other City Bound Routes	Long-term Slight Positive
Finglas to Swords Pavillions	Up to 30% reduction in PT journey times	High (>+20% from baseline)	High- Spine/Core Bus Corridor	Long-term Significant Positive

9.6.2.2.3.2 General Traffic Operational Impact Assessment

There will be no change to the number of traffic lanes both northbound and southbound on the R108 when the Project is operational.

The proposed access to the Dardistown MetroLink Grid Connections sub station will tie into the proposed road network at the Depot. Limited volumes of traffic are anticipated to utilise this access road during the Operational Phase. As a result, the proposed Project will have a Permanent Negligible Negative impact on the road network at this location.

In AZ3 Dardistown to Northwood Section in Scenario A 2035, there is a reduction of 75 car trips made when the proposed Project is in place over the 12hr peak period, with car mode share decreasing by 1 percentage points from the Do Minimum scenario. In 2050, there is a reduction of 97 car trips made in the Do Something scenario, reducing car mode share by 1 percentage point. In 2065, there is a reduction of 131 car trips made in the Do Something scenario, reducing car mode share by 1 percentage point.

In Scenario B 2035, there is a reduction of 98 car trips made when the proposed Project is in place over the 12hr peak period, with car mode share decreasing by 1 percentage point from the Do Minimum scenario. In 2050, there is a reduction of 191 car trips made in the Do Something scenario, reducing car mode share by 1 percentage point. In 2065, there is a reduction of 163 car trips made in the Do Something scenario, reducing car mode share by 1 percentage points.

In the 2035 AM period in both scenarios, zones to the west of the station see a reduction of car mode share of up to 5 percentage points, while zones to the immediate east of the station see changes of less than 1 percentage point. In the 2050 and 2065 AM periods, zones extending further beyond the proposed Project alignment see a reduction in car mode share of up to 5 percentage points, such as at the M50 Motorway /N2 junction.

These reductions in car mode share result in a long-term, Slight, positive impact on general traffic.

Results from the ERM model show reductions in car travel from the surrounding area during the Operational Phase. AADT reduces by approximately 1,000 along the R108 Ballymun Road in the vicinity of Northwood Station in Scenario A 2065, and by up to 500 AADT in Scenario B. In Scenario A 2065, The M50 Motorway at Junction 4 sees a reduction of up to 2,500 AADT, with a reduction of up to 250 AADT in Scenario B 2065. The M50 Motorway to the north of Northwood Station also sees road travel time savings, with savings of up to 25 seconds in Scenario A, with negligible changes in Scenario B. These road travel time savings result in long-term, Moderate, positive impacts on the road network in Scenario A.

Table 9.136 presents a summary of the impact on the road network in AZ3 in the Operational Phase.

Table 9.136: General Traffic Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
West of station	Up to 5 percentage points reduction in car mode share – both scenarios	Low (+/- 1% to 10% from baseline)	Medium- Regional Road Network	Long-term Slight Positive
East of station	<1 percentage point reduction in car mode share – both scenarios	Negligible (+/- 1% from baseline)	Medium- Regional Road Network	Long-term Imperceptible Positive
M50 Motorway Junction 4	Reduction of 1,000-2,500 AADT – Scenario A 2065	Medium (+/- 500 < 2,500 AADT from baseline)	Negligible- Motorway	Long-term Slight Positive
M50 Motorway Junction 4	Reduction of 100-250 AADT- Scenario B	Low (+/- 100 < 500 AADT from baseline)	Negligible- Motorway	Long-term Slight Positive
R108 Ballymun Road	Reduction of 250-500 AADT in Scenario B 2065	Low (+/- 100 < 500 AADT from baseline)	Medium- Regional Road Network	Long-term Slight Positive
R108 Ballymun Road	Reduction of 500-1,000 AADT in Scenario B 2065	Medium (+/- 500 < 2,500 AADT from baseline)	Medium- Regional Road Network	Long-term Moderate Positive

Link	Description	Magnitude	Sensitivity	Significance of Impact
M50 Motorway	Reduction of 25 seconds road travel time- Scenario A 2065	Low (+/- 10 < 50 seconds from baseline)	Negligible- Motorway	Long-term Slight Positive
M50 Motorway	Negligible change in road travel time	Low (+/- 10s)	Negligible- Motorway	Long-term Slight Positive

9.6.2.2.3.3 Pedestrian Operational Impact Assessment

The proposed street level layout provides for footways along both sides of the R108 Ballymun Road during the Operational Phase of the proposed Project. Pedestrian crossing facilities will be provided both north and south of the station entrance to ensure safe access to the station from Northwood Avenue.

Figure 9.42 and Figure 9.43 present the passenger origins and destinations within the 5, 10 and 15 minute walking isochrones from the station. The main origins of passengers in the AM peak are the residential lands immediately surrounding the station. The modelling indicates that passengers will come from walking distances of beyond 20 minutes to the west of the station and span as far as the Hampton Wood area. Passenger demand to the east will include existing residential areas such as Lymewood Mews and Gulliver's Retail Park. Finally, the most significant proportion of passenger demand will originate from the south-east, from the residential area of Coultry.

The destinations for disembarking passengers in the AM peak are predominately to the Northwood Business Campus and surrounding business developments located to the east of the station, and the business developments located to the west of the R108 Ballymun Road.

The pedestrian comfort assessment (Figure 9.46 and Figure 9.47) shows that all footway provisions assessed around Northwood Station during the 2050 AM peak, comply with DCC guidance and have 'Comfortable' Pedestrian Comfort Levels.

The assessment indicates that there is no change in the pedestrian comfort levels from the baseline scenario to when the proposed Project is in operation and therefore there is a long-term, Imperceptible, negative impact to pedestrians from the Project.

In the Scenario A 2065 AM peak hour (Figure 9.48 and Figure 9.49), the assessment indicates the same results, demonstrating that the footway provisions are sufficient to accommodate future volumes of passengers.

Table 9.137: Pedestrian Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
All	No change in comfort level from baseline	Negligible- no change	High (Suburban, proximity to Gulliver's Retail Park)	Long-term Imperceptible Impact

9.6.2.2.3.4 Cycle Operational Impact Assessment

The future street level layout at Northwood Station provides for a one-way cycle lane on both sides of the R108 Ballymun Road within the Project Boundary. Crossing facilities will also be provided at the R108 Ballymun Road/Northwood Avenue signalized junction, to access the station's cycle parking facilities. The improvements made to the cycling infrastructure around the proposed Northwood Station will result in the Quality of Service improving from Level B in the Baseline scenario to Level A in the Operational Phase. This results in a long-term, Moderate, positive impact on the cycle network.

Informed by the adopted methodology it is proposed that 204 cycle spaces will be provided at Northwood Station to accommodate the predicted demand. Half of the proposed cycle parking will be located in a purpose-build building, and half will be accommodated by stands around the station.

Table 9.138: Cycle Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
R108 Ballymun Road	Provision of one-way cycle lane and crossings facilities	Low (Improvement from Level B QoS to Level A QoS)	High (Suburban, proximity to Gulliver's Retail Park)	Long-term Moderate Positive

9.6.2.2.3.5 Parking and Loading Operational Impact Assessment

There will be no impact to parking and loading during the Operational Phase of the Project.

Table 9.139: Parking and Loading Impact Operational Summary

Link	Description	Magnitude	Sensitivity	Significance of Impact
-All	No change to network-	Negligible -No change from Baseline	High- Commercial/ Retail Parking	Long -term Imperceptible Positive

9.6.2.2.4 AZ4 Northwood to Charlemont

This section of the chapter presents a description of the impact on the public transport, road, pedestrian, cycle and parking networks of the AZ4 Northwood to Charlemont Section. The stations within this section include:

- Ballymun;
- Collins Avenue;
- Griffith Park;
- Glasnevin;
- Mater;
- O'Connell Street;
- Tara;
- St Stephen's Green; and,
- Charlemont.

Further details on the operational impacts can be found in the Overall TTA and the station specific TTAs, contained in Appendix A9.2.

Diagram 9.63 presents the 12hr peak period total trip demand in the AZ4 Northwood to Charlemont Section in Scenario A. The total trip demand increases by 12% between 2035 and 2050 from 555,114 trips to 624,269 trips. There is 12% increase in trips from 2050 to 2065, reaching a total trip demand of 699,349 trips.

Total PT mode share increases by 3 percentage points from 35% Do Minimum to 38% Do Something in both 2035. In 2050, Total PT mode share increases by 3 percentage points from 36% in the Do Minimum scenario to 39% in the Do Something. In 2065, the total PT mode share increases by 3 percentage points from 37% in the Do Minimum to 40% in the Do Something.

In both 2035 and 2050, Car mode share decreases by 1 percentage point between the Do Minimum and Do Something scenarios, reducing from 27% to 26% in 2035, and from 25% to 24% in 2050. There is a 0 percentage point change in Car mode share in 2065, remaining at 23% in the Do Something scenario.

Active Modes mode share (which includes end-to-end Walking and Cycling trips, but does not include interchange with the Project) reduces by 2-3 percentage points. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the proposed Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there

is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ4 Northwood to Charlemont Section.

Diagram 9.62: Scenario A 12hr Peak Period Total Trip Demand – AZ4 Northwood to Charlemont Section

Diagram 9.64 presents the 12hr peak period total trip demand in the AZ4 Northwood to Charlemont Section in Scenario B. The total trip demand increases by 13% between 2035 and 2050 from 557,263 trips to 629,139 trips. There is a 12% increase in trips from 2050 to 2065, reaching a total trip demand of 702,000 trips.

Total PT mode share increases by 2 percentage points from 37% Do Minimum to 39% Do Something in 2035. In 2050, there is also an increase of 2 percentage points from 39% in the Do Minimum to 41% in the Do Something. In 2065, the total PT mode share increases by 2 percentage points from 40% in the Do Minimum to 42% in the Do Something.

In 2035 and 2065, Car mode share has a 1 percentage point change between the Do Minimum and Do Something scenarios, while there is no change in 2050. The percentage mode share held by Car reduces from 25% in the 2035 Do Something scenario, to 24% in 2050 and to 22% in the 2065 Do Something scenarios.

Active Modes mode share (which includes Walking and Cycling) reduces by 1-2 percentage points across the forecast years. Whilst end-to-end Active Modes trips will reduce, there will be an increase in Active Modes trips to and from the stations where passengers will interchange with the proposed Project, as presented in 9.6.2.1.2.1 Active Modes Trips. Overall, there is a shift towards sustainable modes (Active Modes and PT combined), and a reduction in Car trip demand in the AZ4 Northwood to Charlemont Section.

Diagram 9.63: Scenario B 12hr Peak Period Total Trip Demand – AZ4 Northwood to Charlemont Section

9.6.2.2.4.1 Public Transport Operational Impact Assessment

In the AZ4 Northwood to Charlemont section, there are a number of opportunities for passengers to interchange with other modes of public transport. The Glasnevin Station will provide a key interchange point with the heavy rail network, with the Maynooth and Kildare lines serving the Glasnevin DART station. Tara Station also will provide an interchange opportunity with the DART network, serving Pearse Street and the DART Southern Coastal Line.

O'Connell Street is also served by the Luas Green Line and Luas Red Line (Abbey Street), facilitating interchange between the proposed Project and other modes of public transport. Charlemont Station will provide the opportunity to interchange with the Luas Green Line to Sandyford, with approximately 18,500- 19,000 passengers transferring both to and from Luas onto the proposed Project over the 12hhr period in both Scenario A 2065 and Scenario B 2065. As many of the stations lie within Dublin City Centre, the stations are located along several bus routes, including multiple routes of multiple frequencies as part of the Bus Network Redesign.

In AZ4 Northwood to Charlemont Section in Scenario A 2035, there are an additional 12,679 PT trips made when the proposed Project is in place over the 12hr peak period, with total PT mode share increasing by 2 percentage points from the Do Minimum scenario. In 2050, there are an additional 15,664 PT trips made in the Do Something scenario, increasing total PT mode share by 3 percentage points. In 2065, there are an additional 20,686 PT trips made in the Do Something scenario, increasing total PT mode share by 3 percentage points.

In Scenario B 2035, there are an additional 11,028 PT trips made when the Project is in place over the 12hr peak period, with total PT mode share increasing by 2 percentage points from the Do Minimum scenario. In 2050, there are an additional 12,964 PT trips made in the Do Something scenario, increasing total PT mode share by 2 percentage points. In 2065, there are an additional 13,584 PT trips made in the Do Something scenario, increasing total PT mode share by 2 percentage points.

The R108 Ballymun Road area to the north of the station sees further increases of up to 10 percentage points change in mode share, with increases of up to 5 percentage points being felt in zones further beyond the alignment. A key trip attractor in close proximity to Collins Avenue station is Dublin City University and therefore public transport connections in this area are of High significance. This results in a long-term, Slight, positive impact to public transport mode share. In the 2035 AM period in both scenarios, Home Farm Road residential area (near Griffith Park Station) sees an increase in PT (including the proposed Project) mode share of up to 10 percentage points, however much of the area surrounding the station sees an increase of up to 5 percentage points.

In the 2035 AM period, the zones in Dublin City Centre see an increase of up to 5 percentage points in PT (including the proposed Project) mode share. This increase extends to a number of zones beyond the alignment in the 2050 and 2065 AM periods. This results in a long-term, Slight, positive impact to public transport mode share.

The public transport journey savings to and from key locations within AZ4 Northwood to Charlemont section are presented in section 9.6.2.1.3 Public Transport Impacts and the Overall TTA (Appendix A9.2). In the Scenario A 2035 AM period, PT journeys from areas in north Dublin, such as Donabate, Swords Pavillions and Swords East, to Dublin City University, see a saving in journey time of approximately 10-23 minutes when the proposed Project is in place, presenting a long-term Significant positive impact of the Project in Scenario A, however these savings are not as large in Scenario B. However, in Scenario A 2065 AM period, PT journeys from Dublin City University to Donabate see a saving of approximately 20 minutes, presenting a long-term, Significant, positive impact. However, in Scenario B, this same journey sees a negligible saving of less than a minute.

In the 2035 AM period in Scenario A, the largest journey time savings can be seen for journeys between Swords Pavillion and Glasnevin, with savings of approximately 49minutes. In Scenario B, the largest journey savings can be seen for journeys between Sandyford and Dublin Airport, with a saving of approximately 30 minutes. This is a reduction of approximately 56% and 36% from the Do Minimum

scenario in Scenario A and Scenario B respectively, presenting a long-term Significant positive impact of the Project in both Scenario A and Scenario B.

PT journeys from the Glasnevin area to and from Dublin Airport also see savings of approximately 25 minutes in the Scenario A 2035, 2050 and 2065 AM periods. This is also a reduction of approximately 50% from the Do Minimum scenario. Similar savings can be seen in Scenario B in the 2035 AM period, however in 2050 and 2065 this reduces to a saving of approximately 23 minutes, a 49% reduction compared to a 52% reduction in 2035. These journey time savings present long-term, Significant, positive impacts to the public transport network when the Project is in place.

In Scenario A, PT journey time savings can be seen for journeys from O'Connell Street to Swords Pavillions, with a saving of approximately 20 minutes in the 2035 AM period, increasing to a saving of approximately 23 minutes in the 2065 AM period. In Scenario B, there is a saving of approximately 17 minutes in 2035, increasing to 19 minutes in 2065. These journey time savings present long-term, Significant, positive impacts of the proposed Project in both scenarios.

As a result of the opportunity to interchange with the Luas Green Line at Charlemont Station, the public transport journey times to Sandyford, the end of the Luas Green Line, see large savings. In the 2035, 2050 and 2065 AM peak hours, a public transport journey time from Sandyford to Swords Pavillions sees a saving of approximately 30 minutes, or approximately 30%-35% reduction, resulting in a long-term Profound positive impact in all years. Whilst the journey time savings in Scenario B are lower, these also present long-term, Profound, positive impacts.

Public transport journeys from Sandyford to Dublin Airport also see savings of approximately 37 minutes in the Scenario A 2035 AM peak hour, increasing to a saving of 29 minutes in the 2065 AM peak hour. This results in a reduction is approximately 34% in 2035, and increasing to 35% in 2065 in Scenario A. In Scenario B, these journeys see savings of approximately 32 minutes, equating to a 37% reduction in 2065. These journey times savings present the long-term, Significant, positive impacts of the proposed Project to the public transport network.

Table 9.140 presents a summary of the impact on the public transport network in AZ4 during the Operational Phase.

Table 9.140: Summary of Operational Impact on Public Transport Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Mode Share				
East and West of Alignment	10 percentage point increase in PT (including Project) mode share- both scenarios	Medium (+/- 10% to 20% from baseline)	Medium- Other City Bound Routes	Long-term Moderate Positive
R108 Ballymun Road	10 percentage point increase in PT (including Project) mode share – both scenarios	Medium (+/- 10% to 20% from baseline)	High (Core Bus Corridor)	Long-term Moderate Positive
Home Farm Road	10 percentage point increase in PT (including Project) mode share – both scenarios	Medium (+/- 10% to 20% from baseline)	Low- (Local Services)	Long-term Slight Positive
All Dublin City Centre	5 percentage point increase in PT (including Project) mode share- both scenarios	Low (+/- 1% to 10% from baseline)	High (Core Bus Corridors) Multiple)	Long-term Slight Positive

Link	Description	Magnitude	Sensitivity	Significance of Impact
Changes in Journey Times				
Ballymun to Sandyford	20min Reduction in PT journey time- both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Ballymun to Dublin City Centre	Up to 15min reduction in PT journey time – both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Swords Pavillions to Dublin City University	22min reduction in PT journey time – Scenario A	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Glasnevin to Swords Pavillions	40min reduction in PT journey time- Scenario A	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Glasnevin to Swords Pavillions	30min reduction in PT journey time- Scenario B	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Glasnevin to/from Dublin Airport	25min reduction in PT journey time- both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
O'Connell Street to Swords Pavillions	15-25min reduction in PT journey time- both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
O'Connell Street to Dublin Airport	20-25min reduction in PT journey time- both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
College Green to Swords Pavilions	12-17min reduction in PT journey time- Scenario A	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
St Stephen's Green to Swords Pavillions	20-25min reduction in PT journey time – Scenario A	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
St Stephen's Green to Dublin Airport	20-25min reduction in PT journey time – both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Sandyford to Swords Pavillions	32min reduction in PT journey time- Scenario A	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive
Sandyford to Dublin Airport	20-35min reduction in PT journey time- both scenarios	High (+/- >25% from baseline)	High (Core Bus Corridor)	Long-term Significant Positive

9.6.2.2.4.2 General Traffic Operational Impact Assessment

Ballymun

The future street level layout as part of the proposed Project provides for car parking spaces along both sides of the R108 Ballymun Road to the east of the Ballymun Station, and additional taxi pick-ups. As part of the BusConnects Core Bus Corridor proposals, the existing road layout on the R108 Ballymun Road will be reduced to one lane in both directions for vehicular traffic to accommodate a designated bus lane and cycling infrastructure in the vicinity of the Ballymun Station.

Collins Avenue

The changes to the street level layout are as a result of the BusConnects Core Bus Corridor proposals on the R108 Ballymun Road. The future street level layout at Collins Avenue includes a realignment of the current road layout with a reduction from two lanes to one northbound lane for vehicular traffic on the R108 Ballymun Road to the immediate west of the station. Southbound, the existing road layout of two vehicular traffic lanes, will be maintained.

Griffith Park

The existing road network layout at Griffith Park station will be maintained in the Operational Phase, with one lane of vehicular traffic in each direction on R108 St Mobhi Road.

Glasnevin

As part of the BusConnects Core Bus Corridor proposals, the future street level layout at Glasnevin Station reduces the current road network to one lane in each direction to accommodate a designated bus lane and bus stop along R108 Prospect Road. As part of the proposed Project, a taxi/drop-off area will be provided to the north of the station entrance in lands currently occupied by the Brian Boru car park. A new access road from Prospect Road to these facilities will also provide access to the bicycle parking.

Mater

At Mater Station the future street level layout will maintain the existing road network on Berkeley Street. To accommodate the station entrance, the current footways and traffic lanes on Eccles Street will be realigned as part of the proposed Project.

O'Connell Street

The future street level plan at O'Connell Street Station will have no impacts to the current road layout.

Tara

The future street level layout at Tara Station as part of the proposed Project will reduce Poolbeg Street to one-lane shared use space in the westbound direction as part of the proposed Project. At present there are minimal volumes of traffic utilising Poolbeg Street and therefore there will be a permanent Not Significant negative impact on general traffic on this link.

There will be no vehicular access to the Tara Station, therefore no additional vehicle traffic is expected during the Operational Phase of this station.

St Stephen's Green

The future street level layout at St Stephen's Green Station will include the realignment of the R138 St Stephen's Green East to one lane of northbound vehicular traffic, to accommodate the designated bus lanes and improved cycling infrastructure.

Charlemont

As part of the proposed Project at Charlemont Station, new pedestrian crossing will be provided to the east of the station on Grand Canal; however, this will have a minimal impact on driver delay on this road.

AZ4 Northwood to Charlemont Section

In AZ4 Northwood to Charlemont Section in Scenario A 2035, there is a reduction of 3,341 car trips made when the Project is in place over the 12hr peak period, with car mode share decreasing by 1 percentage points from the Do Minimum scenario. In 2050, there is a reduction of 4,387 car trips made in the Do Something scenario, reducing car mode share by 1 percentage point. In 2065, there is a reduction of 6,275 car trips made in the Do Something scenario, reducing car mode share by 1 percentage point.

In Scenario B 2035, there is a reduction of 3,006 car trips made when the Project is in place over the 12hr peak period, with Car mode share decreasing by 1 percentage point from the Do Minimum scenario. In 2050, there is a reduction of 3,355 car trips made in the Do Something scenario, reducing car mode share by 1 percentage points. In 2065, there is a reduction of 3,084 car trips made in the Do Something scenario, reducing car mode share by 0 percentage points.

In the 2035 AM period in both scenarios, zones to both the east and west of the alignment in this section see a reduction of up to 5 percentage points in car mode share. In the 2050 and 2065 AM periods, the zones that also see these reductions in car mode share of up to 5 percentage points extend further beyond the alignment, such as along the R135 Finglas Road to the west of the Ballymun Station and to the east of the alignment along the M50 Port Tunnel. As a result, there is a long-term, Slight, positive impact to road users when the proposed Project is in operation.

The R108 Ballymun Road between Santry Avenue and the R135 sees reductions in AADT of up 500 AADT in Scenario A 2065, however there are increases in AADT of up to 500 AADT in the section at Collins Avenue, before reducing again by 250 AADT at Griffith Park. The network around Mater station sees a reduction of up to 500 AADT, with similar reductions seen on Parnell Street in the vicinity of O'Connell Street. Tara Street sees larger reductions of up 2,500 AADT in this scenario. In the vicinity of both St Stephen's Green and Charlemont there are reductions of up to 250 AADT. As a result, there are negligible changes to road travel time in this scenario.

In Scenario B 2065, much of the R108 Ballymun Road sees negligible changes in AADT, with reductions of up to 250 AADT in the vicinity of Collins Avenue. The R135 Finglas Road in the vicinity of Glasnevin Station also sees reductions of up to 250 AADT. Much of Dublin City Centre sees negligible reductions, with Grand Parade in the vicinity of Charlemont station seeing reductions of up to 250 AADT. As a result, there are negligible changes to road travel times in this scenario.

In the 2035 AM period in both scenarios, the zones along the heavy railway see a reduction of car mode share by up to 5 percentage points as a result of the potential to interchange, however much of the surrounding zones see negligible changes. In the 2050 and 2065 AM periods, the zones that also see these reductions in car mode share of up to 5 percentage points extend further beyond the alignment, such as along the heavy railway and towards the M50 Motorway to the west of Glasnevin Station. This results in a long-term, Slight, positive impact to car mode share.

In 2035 in both scenarios, the zones surrounding Dublin City Centre Stations (O'Connell Street, Tara Street, St Stephen's Green and Charlemont) see changes in car mode share of less than 1 percentage point. In the 2050 and 2065 AM periods, the reductions in car mode share extend further beyond the alignment, such as along the R148 eastbound and further south of the alignment. This results in a long-term, Slight, positive impact.

Table 9.141 presents a summary of the impact on the road network in AZ4 during the Operational Phase.

Table 9.141: Summary of Operational Impact on Road Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Mode Share				
East and west of Alignment	5 percentage point reduction in car mode share- both scenarios	Low (+/- 1% to 10% from baseline)	High (mix of Regional Road network and Local Road network)	Long-term Slight Positive
Along heavy railway	5 percentage point reduction in car mode share- both scenarios	Low (+/- 1% to 10% from baseline)	Medium (Regional Road Network)	Long-term Slight Positive
All Dublin City Centre	<1 percentage point reduction in car mode share- both scenarios	Negligible (+/- 1% from baseline)	High (mix of Regional Road network and Local Road network)	Long-term Imperceptible Positive
Change in AADT				
R103 Glasnevin Avenue	Reduction of up to 1,000 AADT- Scenario A 2065	Medium (+/- 500 < 2,500 AADT from baseline)	High (Regional Road network with sensitive receptor nearby)	Long-term Significant Positive
R108 Ballymun Road (Collins Avenue)	Increase of up to 500 AADT- Scenario A 2065	Low (+/- 100 < 500 AADT from baseline)	High (Regional Road network with sensitive receptor nearby)	Long-term Slight Negative
R108 Ballymun Road (Collins Avenue)	Reductions of 250 AADT – Scenario B 2065	Low (+/- 100 < 500 AADT from baseline)	High (Regional Road network with sensitive receptor nearby)	Long-term Slight Positive
R102 Griffith Avenue	Increase of 250-500 AADT in Scenario A 2065	Low (+/- 100 <500 AADT from baseline)	Medium (Regional Road Network)	Long-term Slight Negative
R102 Griffith Avenue	Reduction of 250-500 AADT in Scenario A 2065	Low (+/- 100 <500 AADT from baseline)	Medium (Regional Road Network)	Long-term Slight Positive
R108 Prospect Road	Reduction of 250 AADT- both scenarios	Low (+/- 100 < 500 AADT from baseline)	High (Regional Road network with sensitive receptor nearby)	Long-term Slight Positive
N1 (DCU Campus)	Reduction of >5,000 AADT-	Very High (+/-> 5,00	High (National Road)	Long-term Very Significant Positive

Link	Description	Magnitude	Sensitivity	Significance of Impact
	Scenario A 205	AADT from baseline)		
M1 (DCU Campus)	Reduction of 1,000 AADT	Medium (+/- 500 < 2,500 AADT from baseline)	High (National Road)	Long-term Moderate Positive
Dublin City Centre	Reduction of up -250 AADT – both scenarios	Low (+/- 100 < 500 AADT from baseline)	High (mix of Regional Road network and Local Road network)	Long-term Slight Positive
R802 Tara Street	Reduction of 2,500 AADT-Scenario A 2065	Medium (+/- 500 < 2,500 AADT from baseline)	High (Regional Road in Dublin City Centre)	Long-term Moderate Positive
Change in Road Travel Time				
R108 Ballymun Road north of R103 junction	25sec saving in road travel time-Scenario A 2065	Low (+/- 10 < 50 seconds from baseline)	High (Regional Road network with sensitive receptor nearby	Long-term Slight Positive
R108 Phibsborough Road	25 seconds road travel time saving in both scenarios	Low (+/- 10 < 50 seconds from baseline)	High (Regional Road network with sensitive receptor nearby	Long-term Slight Positive
N1 Drumcondra Road Lower/R132	50s road travel time saving-Scenario A 2065	Low (+/- 10 < 50 seconds from baseline)	High (National Road Network)	Long-term Slight Positive
Dublin City Centre	+10/-10 seconds change in road travel time in both scenarios	Negligible (+/- 10 seconds)	High (Dublin City Centre)	Long-term Not-Significant Positive

9.6.2.2.4.3 Pedestrian Operational Impact Assessment

Passenger Origins and Destinations

Figure 9.42 and Figure 9.43 present the passenger origins and destinations within the 5, 10 and 15 minute walking isochrones from the stations. In the R108 Ballymun Road are of this section, the main origins of passengers at Collins Avenue station in the AM peak is the Dublin City University to the south-east of the station. The modelling indicates that passengers will come from the Willow Park residential areas to the west of the station, some travelling for over 15 minutes. Towards the north-east, the modelling indicates that passengers will come from the Santry residential area and from the Omni Shopping Centre. To the west of the stations, passengers are disembarking and travelling towards the commercial land uses in Finglas East, while a number of passengers are heading south of the station to the various land uses along the R108 Ballymun Road.

The proposed street level layout at Glasnevin Station provides for pedestrian footways on both sides of R108 Prospect Road, with pedestrian crossing facilities to the north and south of the station entrance. Interchange between the proposed Project and the DART lines occurs within the station box and therefore the large volume of interchanging passengers will not utilise the external pedestrian network.

The main origins of passengers at Glasnevin Station in the AM peak are the residential areas immediately surrounding the station. The modelling indicates that passenger will come from walking distances of more than 15 minutes to the east of the station and span as far as the Drumcondra area. The main destinations for disembarking passengers in the AM peak are St Vincent's School, north of the station and the Phibsborough Shopping Centre, south of Glasnevin Station.

At Mater Station, the main origins of passengers in the AM peak are residential areas immediately surrounding the station and Mater Hospital. The modelling also highlights the Grangegorman area as a key origin.

In addition to substantial transfers from the Luas, significant origins of passengers at O'Connell Street Station in the AM peak include the residential area around Mountjoy Square, and Connolly Rail Station. Multiple destinations receive significant volume of disembarking passengers in the AM peak, including the Rotunda Hospital, stops along the Luas Red Line such as Smithfield and Abbey Street, the commercial district to the east and west of O'Connell Street and Connolly Train Station.

The future street level layout at Tara Station as part of the proposed Project includes an extension of the existing footway on Poolbeg Street by approximately 1.5m to accommodate the station entrance. Poolbeg Street will also be a shared-use space for pedestrians, cyclists and vehicles, however minimal volumes of traffic are expected at this location. The pedestrian crossing on R802 Tara Street will also be realigned and increased to a width of 1.6m to facilitate safe crossing of the large volume of passengers forecasted to utilise this station. At the section of Townsend Street east between the station entrance and Moss Street, the footpath will be widened, reducing Townsend Street east to one traffic lane in this section.

The main origins of passengers in the AM peak at Tara Station are residential and employment areas at the east of the station such as Northwall and Dublin Docklands. The modelling indicates that passenger will come from walking distances of more 15 to 20 minutes to the east of the station and span as far as the Shelbourne Park (Greyhound Stadium) area. Trinity College Dublin south of the station highlights as a main origin of passengers as well.

Pedestrian Comfort Assessment

An assessment of the pedestrian provision around the station has been undertaken, in order to confirm its robustness in catering for the additional demand associated with the proposed project. A Future Year scenario (Scenario A 2050) was assessed in the AM peak hour, shown in Figure 9.46 and Figure 9.47, with the Scenario A 2065 worst-case scenario presented in Figure 9.48 and Figure 9.49. Full details of the results of the assessment at each station can be found in the station specific TTAs (Appendix A9.2).

At Ballymun, the results show that in 2050 and 2065, Balbutcher Lane (Shangan Road West) falls below DCC Guidance, however it has an 'Acceptable' 'level of pedestrian comfort.

At Collins Avenue, the results of the 2050 assessment indicate that Glasnevin Avenue and Ballymun Road (south of the station) and St Pappin's Road will fall below DCC Guidance, however they will have an 'Acceptable' pedestrian comfort level. However, in the 2065 AM peak hour, Glasnevin Avenue changes to 'Uncomfortable' with the increased passenger demand in the forecast year and current configuration of street furniture, while Ballymun Road South and St Pappin's Road remain at an 'Acceptable' comfort level. Glasnevin Avenue has large grass verges on footways, with inappropriately placed bins reducing the available clear width for pedestrians, and therefore it is possible to mitigate this impact (Section 9.7.2 Mitigation Measures Operational Phase).

At Griffith Park, Glasnevin and Mater Stations, the 2050 assessment indicates that all links will meet with DCC guidance. In 2065, Finglas Road (in close proximity to Glasnevin Station) and North Circular Road

West (in close proximity to Mater station) will fall below the guidance, however Finglas Road is deemed 'Comfortable' against the TfL Calculator, with North Circular Road West having an 'Acceptable level of pedestrian comfort.

In recognition of the potentially complex routing and road crossing behaviour at Glasnevin Station, a VisWalk microsimulation model was also produced for the area surrounding the station. The model incorporates the proposed Project, DART+, and the BusConnects Core Bus Corridor infrastructure proposals in this area. The Glasnevin TTA (Appendix A9.2) further details the modelled process, model demands and model development.

During initial runs of the model, the model experienced saturation on the pedestrian crossing at the southern side of the R108/Whitworth Road junction. Within the model, this crossing has been widened from 2m to 4m in width. Whilst this has not been incorporated into the design at present, it has been confirmed that there is space to accommodate this change in width. This change has been sufficient to stop the model from locking up and it provides adequate capacity to accommodate forecast pedestrian demand in the 2035 and 2050 scenarios. These design changes are being put forward to be implemented in the Opening Year.

The model indicates that there is sufficient capacity for the transfer of passengers between the Project and DART services. Passengers are able to transfer between the platforms for these services without experiencing congestion or poor levels of service. The results indicates that in general the network within the DART/Glasnevin Station building experiences an LOS of B or better. The exception to this is the foot of the escalators in at the station, where waiting pedestrians mean that the LOS is lower.

The LOS on the network external to the station is also generally at criteria B or better. However, the LOS is inevitably lower at the ends of pedestrian crossings as people are required to wait for the relevant green phase in order to cross. This delay to pedestrians is concentrated at the entrances to the crossings and does not impede the operation of the wider network.

At O'Connell Street Station, the pedestrian comfort assessment was conducted in two parts. Firstly, as at other stations, a 'Footway Comfort Assessment' was carried out in the Operational Phase, which predicts the pedestrian comfort levels at a relatively strategic level based on industry guidance, taking cognisance of factors including pedestrian demand and footway width.

An assessment of the Scenario A 2050 AM peak hour scenario (Figure 9.46 and Figure 9.47) indicates that all links comply with DCC guidance and are deemed 'Comfortable', with the exception of Parnell Street West, however this has an 'Acceptable' pedestrian comfort level. The Scenario A 2065 AM peak hour assessment (Figure 9.48 and Figure 9.49) indicates the same results, illustrating that the provisions are sufficient to accommodate future levels of pedestrian demand.

Secondly, a similar but more fine-grained assessment has been undertaken, covering the local street network immediately adjacent to the station site. This has been undertaken for the 2045 and 2060 Future Year scenarios, both with and without the Dublin Central development in place. This broadly aligns with the pedestrian movement analysis undertaken by Hammerson Ireland (planning reference 2861/21, 2862/21 and 2863/21) which includes the operation of the O'Connell Street Station, also indicates that in the morning peak, O'Connell Street, Parnell Street West, Moore Street and O'Rahilly Parade will have a 'Comfortable' pedestrian comfort level. In the evening peak, the section of O'Connell Street at the station entrance, and Parnell Street West will be an 'Acceptable' pedestrian comfort level.

As the pedestrian assessment scenarios differ from those of the EIAR, the percentage difference in total boarding passengers between the relevant years was calculated. From 2045 to 2050 there is a 2% increase in the volume of total boarding passengers at O'Connell Street in Scenario A, whilst from 2060 to 2065 there is a 6% decrease in the total number of boarding passengers. As such, the assessment is a reasonable representation of the forecasted operation of the O'Connell Street Station.

Footway performance was reviewed for both AM and PM peak hours for the base (2018 survey or 2021 projected impact of Dublin Central) and then 2045 and 2060 footfall forecasts. Only one location (a section of Parnell Street where footway width is below 2.0m) is highlighted as 'At risk' or

'Uncomfortable'. This is identified as an existing issue in the base scenario and forecast impacts from introduction of the proposed Project reach a maximum of 19% growth in the more challenging PM peak period.

Overall, with the exception of this one existing location, the local station area is confirmed as retaining acceptable pedestrian comfort levels for the full range of demand and development scenarios.

At Tara Station the results indicate that the R138 west, George's Quay west, and Townsend Street West will fall below DCC guidelines in 2050, with all three links having an 'Uncomfortable' pedestrian comfort level according to TfL guidance. In the 2065 AM peak hour, the assessment indicates similar results, however Townsend Street East changes from 'Comfortable' to an 'Acceptable' comfort level.

Additionally, a VisWalk microsimulation model has been developed for the immediate area surrounding the Tara Station, the results of which are shown within the Tara Station TTA (Appendix A9.2). The accuracy of the VisWalk microsimulation model to simulate real world scenarios therefore supersedes the static analysis. The Tara Street VisWalk model demonstrates that the current design for the proposed station is expected to perform with an acceptable Level of Service. The proposed public plaza offers a high level of service regarding pedestrian routing. The north side of Townsend Street (between the station entrance and Moss Street) experiences relatively high demand and therefore the widening of the footway at this location (reducing Townsend Street east to one traffic lane only) facilitates improvements to pedestrian congestion and crossings at this location.

The results show that R138 Kildare Street Upper, R138 Merrion Row, Merrion Street Upper, R816 Baggot Street Lower and R138 Leeson Street Lower will be below DCC Guidelines in 2050, however all will have an 'Acceptable' pedestrian comfort level. This is no change from the baseline scenario and therefore the proposed Project will have a long-term, Imperceptible, negative impact on pedestrians in 2050. In the 2065 AM peak hour, the assessment indicates the same results, with the addition of Hume Street falling below DCC guidance, however it is also deemed to have an 'Acceptable' pedestrian comfort level, demonstrating that the pedestrian provisions around St Stephen's Green will be sufficient to accommodate future demand.

A VisWalk microsimulation model has also been developed for the immediate area surrounding the St Stephen's Green Station for Scenario A 2050, with results presented in the station specific TTA (Appendix A9.2). The results demonstrate that the network operates with an acceptable level of service in the majority of locations. The level of service is lower at specific locations on the network (Level D and Level E), such as the waiting areas at signalised pedestrian crossings and at the entrances to the station escalators. Some delay at these locations is likely due to the high pedestrian demand, and it is considered that the overall level of service on the network is acceptable.

The results of the Charlemont assessment show that all links will fall below DCC guidance in 2050, with the exception of Dartmouth Road. Whilst they do not meet DCC guidance, they are deemed to have an 'Acceptable' level of comfort, with the exception of Grand Parade West which has an 'Uncomfortable' rating. In 2065, the results show that all links will fall below DCC guidance, with the exception of Dartmouth Road. Both Charlemont Street and Grand Parade West are deemed 'Uncomfortable', while Ranelagh Road and Canal Road maintain an 'Acceptable' level of comfort.

A VisWalk microsimulation model has been developed to for the immediate area surrounding Charlemont Station, with results presented in the station specific TTA (Appendix A9.2).

With the new pedestrian infrastructure in place, the VisWalk microsimulation model indicates that R111 Grand Parade will have a Level B Level of Service overall, however at the location of the proposed pedestrian crossing the Level of Service is lower with 'some restriction in selection of walking speed and ability to pass others', this occurs as pedestrians are required to wait for a green phase at the signals. Overall, it is considered that the model displays an acceptable level of network performance in the assessment.

Table 9.142 presents a summary of the impact on the pedestrian network in AZ4 during the Operational Phase.

Table 9.142: Summary of Operational Impact on Pedestrian Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Shangan West	Reduction from PCL Grade A to Grade B	Low (Reduction from PCL Grade A to Grade B)	High (Town Centre)	Long-term Slight Negative
Others- Ballymun Station	'Comfortable' pedestrian comfort level	Negligible (No change from baseline)	High (Town Centre)	Long-term Imperceptible Negative
R103 Glasnevin Avenue (2050)	'Acceptable' pedestrian comfort level	Medium (From PCL A to PCL B)	High (Town Centre)	Long-term Moderate Negative
R103 Glasnevin Avenue (2065)	'Uncomfortable' pedestrian comfort level	High (PCL A to PCL D)	High (Town Centre)	Long-term Significant Negative
R108 Ballymun Road (south of Collins Avenue Station)	'Acceptable' pedestrian comfort level	Medium (From PCL A to PCL C)	High (Town Centre)	Long-term Moderate Negative
All- Griffith Park	'Comfortable' pedestrian comfort level- Scenario A	Negligible (No change from baseline)	Medium (Suburban)	Long-term Imperceptible Negative
All- Mater (2050)	No change in comfort level from baseline	Negligible (No change from baseline)	High (Town Centre)	Long-term Imperceptible Negative
R108 Phibsborough Road- Glasnevin	Model operates well with minimal congestion observed.	Low (Minimal congestion occurring)	High (Town Centre)	Long-term Slight Negative
R101 North Circular Road (2065)	Below DCC guidelines but 'Acceptable' comfort level	Low (From PCL A to PCL B)	High (Town Centre)	Long-term Moderate Negative
Parnell Street West (2050 and 2065)	Changes from 'Comfortable' to 'Acceptable' comfort level	Medium (From PCL A to PCL C)	High- Dublin City Centre location	Long-term Moderate Negative
R138 George's Quay West (2065)	From 'Comfortable' to below DCC guidelines and 'Uncomfortable Comfort Level but Acceptable VisWalk Level of Service	High (Level C Level of Service)	High- Dublin City Centre location	Long-term Moderate Negative
Townsend Street West	'Uncomfortable' comfort level, however VisWalk model indicates Level B Level of Service	Low (Acceptable level of service)	High- Dublin City Centre location	Long-term Slight Negative
Townsend Street East	Below DCC guidelines but 'Acceptable' comfort level	Medium (From PCL A to PCL C)	High- Dublin City Centre location	Long-term Moderate Negative
Kildare Street Upper	Below DCC guidelines but 'Acceptable' comfort level	Low (From PCL A to PCL B)	High- Dublin City Centre location	Long-term Slight Negative Impact
Charlemont Street (2065)	Below DCC guidelines and 'Uncomfortable' comfort level	Medium (From PCL B to PCL D)	High- Dublin City Centre location	Long-term Moderate Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
Ranelagh Road	Below DCC guidelines and 'Acceptable' comfort level	Negligible (No change from baseline)	High- Dublin City Centre location	Long-term Imperceptible Negative
R111 Grand Parade West (2065)	Below DCC guidelines and 'Uncomfortable' comfort level with Level B Level of Service – some congestions present at Luas interchange	Medium (From PCL A to PCL D, however VisWalk 'Acceptable' level of service)	High- Dublin City Centre location	Long-term Moderate Negative

9.6.2.2.4.4 Cycle Operational Impact Assessment

The future street level layout at Ballymun Station provides for a one-way cycle lane on both sides of the R108 within the Project Boundary. These improvements in the cycle infrastructure will result in the Quality of Service improving from Level B in the Baseline scenario to Level A in the operational phase.

Improvements will be made to the current cycling infrastructure around the proposed Collins Avenue Station when the proposed Project is in place, with the provision of a 2m wide cycle lane in each direction on the R108 within the Project Boundary. As a result, the Quality of Service will improve from Level C in the Baseline scenario to Level B in the operational phase.

Improvements will be made to the current cycling infrastructure around the future Griffith Park Station, within the Project Boundary, when the proposed Project is in place. The current cycle infrastructure will be upgraded to a two-way cycle lane on the southbound side of St Mobhi Road, resulting in the Quality of Service improving from Level C in the Baseline scenario to Level A in the operational phase.

The future street level layout at Glasnevin provides for a two-way cycle lane along the northern boundary of the station box to facilitate access to the cycle parking facilities. A segregated two-way cycle lane is also provided along the southbound side of Prospect Road, with a cycle crossing present to provide safe access to the station. These improvements to the cycle infrastructure along Prospect Road will result in the Quality of Service improving from Level B in the Baseline scenario to Level A in the operational phase.

The future street level layout will maintain the current cycling infrastructure along Berkeley Road within the Project Boundary, with a one-way cycle lane in each direction. As such, there will be no impact to the Quality of Service in this area.

The future street level layout does not make any alterations to the current cycle infrastructure at this location, so there will be no impact to the Quality of Service of cycling infrastructure around O'Connell Street Station when the proposed Project is in place.

The future street layout at Tara Station provides for a new two-way cycle link along Luke Street, as part of the shared-use space in this area, which will improve the provisions for cyclists in general. There will be no impact to the Quality of Service of cycling infrastructure along Tara Street when the proposed Project is in place.

The current cycle lanes along the R138 will be realigned as part of the proposed street level layout, within the Project Boundary, however there will be no impact to the Quality of Service of cycling infrastructure around St Stephen's Green Station when the proposed Project is in place.

The future street level layout will maintain the existing cycle infrastructure at Charlemont Station and therefore there will be no impact to the Quality of Service of cycling infrastructure around Charlemont Station when the proposed Project is in place.

The following allocations of cycle parking have been proposed:

- Ballymun Station: 292 cycle spaces proposed- half will be located in a cycle and café building and half in stands;
- Collins Avenue: 370 cycle spaces are proposed- half will be provided within a covered structure, and te remainder in stands;
- Griffith Park: 176 cycle spaces are proposed- half will be located in an underground bicycle parking facility and the remainder in on-street bicycle stands;
- Glasnevin: 120 proposed cycle spaces are proposed;
- Mater: 70 cycle spaces are proposed, located on a shared surface plaza to Eccles Street;
- O'Connell Street: No cycle spaces are proposed;
- Tara Street: 256 cycle spaces are proposed- half will be provided under cover and half will be located in bicycle racks;
- St Stephen's Green: 82 cycle spaces are proposed within vicinity of the station; and,
- Charlemont: 162 cycle spaces are proposed located surface section on the public plaza at Dartmouth Road.

Table 9.143 presents a summary of the impact on the cycle network in AZ4 during the Operational Phase.

Table 9.143: Summary of Operational Impact on Cycle Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
R108 Ballymun Road-Ballymun	One-way cycle lane on both sides of the R108	Low (Improvement from Level B QoS to Level A QoS)	High- Secondary Route	Long-term Moderate Positive
R108 Ballymun Road-Collins Avenue	2m wide cycle lane in each direction on the R108	Low (Improvement from Level C QoS to Level B QoS)	High- Secondary Route	Long-term Moderate Positive
R108 St Mobhi Road	Current cycle infrastructure will be upgraded to a two-way cycle lane on the southbound side of St Mobhi Road,	High (Improvement from Level C QoS to Level A QoS)	High- Secondary Route	Long-term Significant Positive
R108 Prospect Road	Two-way cycle lane along the northern boundary of the station box to facilitate access to the cycle parking facilities. A segregated two-way cycle lane is also provided along the southbound side of Prospect Road, with a cycle crossing present to provide safe access to the station.	Low (Improvement from Level B QoS to Level A QoS)	High- Secondary Route	Long-term Moderate Positive
Berkeley Road	Maintaining existing cycle facilities	Negligible	No designation but proximity to Primary Network	Long-term Imperceptible Positive Impact

Link	Description	Magnitude	Sensitivity	Significance of Impact
			and Feeder Network	
O'Connell Street	Maintaining existing cycle facilities	Negligible	High- Secondary Route	Long- Term Imperceptible Positive
Tara Street	New two-way cycle link along Luke Street, as part of the shared-use space in this area	Low- no change to QoS	No designation but proximity to Primary Network and Feeder Network	Long-Term Slight Positive Impact
St Stephen's Green	Current cycle lanes along the R138 will be realigned	Low- no change to QoS	High- Primary Network	Long-Term Slight Positive Impact
R111 Grand Parade	Maintaining cycle facilities	Negligible	-No designation but proximity to Secondary Network	Long- Term Imperceptible Positive

9.6.2.2.4.5 Parking and Loading Operational Impact Assessment

While there will be a loss of commercial and residential parking and loading infrastructure as a result of the proposed Project, the modal shift from road to public transport when the proposed Project is in place will reduce the overall demand on parking and loading facilities, thus reducing the severity of the impact.

There will be a loss of commercial parking in Ballymun Car Park to facilitate the station entrance and associated cycle parking. However, a total of 24 car parking spaces will be provided along both sides of the R108 Ballymun Road at Ballymun Station, reducing the severity of the impact.

There is no designated on-street parking on the R108 however informal parking occurs along the northbound side at the Our Lady of Victories Infants and Boys National Schools. The proposed street level layout includes 12 drop-off spaces northbound on the R108 Ballymun Road, which are segregated from the bus lane and cycle lane. The future street level layout at Collins Avenue also includes the removal of all Pay and Display (11:00 to 17:00) parking spaces along Albert College Court to accommodate the provision of cycle parking.

The realignment of Eccles Street, and the widening of the footway on Berkeley Road will result in the loss of on-street parking at both locations. Approximately 20 on-street parking spaces will be lost on Eccles Street, while approximately 14 spaces will be lost on Berkeley Road.

The future street layout at Tara Station involves the removal of a loading bay on Townsend Street West. Seven Pay and Display and Permit Parking car parking spaces will also be removed from Townsend Street to accommodate the southern station entrance.

The 16 existing on-street parking spaces on the R138 will be removed as part of the proposed street level layout at St Stephen's Green to accommodate the realignment of the bus and cycle lanes, and the provision of cycle parking.

Table 9.144 presents a summary of the impact on the parking network in AZ4 in the Operational Phase.

Table 9.144: Summary of Operational Impact on Parking Network

Link	Description	Magnitude	Sensitivity	Significance of Impact
Ballymun Car Park	Loss of commercial parking	Medium (+/- 10% to 25% from	High- Commercial Parking	Long-term Slight Negative

Link	Description	Magnitude	Sensitivity	Significance of Impact
		baseline)		
R108 Ballymun Road-Ballymun Station	24 new spaces	Medium-compensates for loss	High- Commercial Parking	Long-term Moderate Positive
R108 Ballymun Road-Collins Avenue	Provision of on-street parking spaces	High- currently informal bus lane parking	High- Parking for Church and nearby school	Long-term Significant Positive
Albert College Court	Removal of all spaces	High (+/- > 25% of spaces removed)	Medium-Residential parking	Long-term Moderate Negative
Brian Boru Car Park	Removal of Car Park (not operational in baseline)	Negligible-(No change from baseline)	Low- Not Operational	Long-term Imperceptible Negative
Eccles Street	Removal of on-street parking	High (+/- > 25% of spaces removed)	High- Proximity to Mater Hospital	Long-term Significant Negative
Berkeley Road	Removal of on-street parking	High (+/- > 25% of spaces removed)	Medium-Commercial parking	Long-term Moderate Negative
Townsend Street	Removal of 7 spaces	Low (+/- 0% to 10% from baseline)	High- Dublin City Centre	Long-term Slight Negative
Townsend Street	Removal of 1 loading bay	Low (+/- 0% to 10% from baseline)	High- Dublin City Centre	Long-term Slight Negative
R138 St Stephen's Green East	Removal of on-street parking	High (+/- > 25% of spaces removed)	High- Dublin City Centre	Long-term Significant Negative

9.6.2.3 Operational Phase Summary

The assessment indicates that overall, the proposed Project will result in long-term, Significant, positive impacts on all users.

The most significant positive impacts will be on the public transport network, which will see increases in public transport mode share along the alignment, will increase its interchange opportunities at Glasnevin, Tara Street and Charlemont, and will present long-term Significant, positive, and in some cases long-term, Profound, positive impacts on public transport journey times to and from key locations such as Swords, Dublin Airport and Glasnevin.

Considering all of the AZ geographical sections combined in Scenario A during the 12hr period, there is an increase of 26,610 total PT trips made between the 2035 Do Minimum and Do Something scenarios. This increases to an additional 33,272 total PT trips between the 2050 Do Minimum and Do Something scenarios. In 2065, there is an increase of 43,350 total PT trips between the 2065 Do Minimum and Do Something scenarios. AZ2 Airport section sees the largest increase in PT mode share, increasing by 9 percentage points in 2065.

In Scenario B during the 12hr period, in total in the combined AZ geographical sections there is an increase of 23,644 total PT trips between the 2035 Do Minimum and Do Something scenarios. In 2050, there is an increase of 32,869 total PT trips between the Do Minimum and Do Something scenarios. In 2065, there is an increase of 33,194 total PT trips between the Do Minimum and Do Something scenarios. AZ2 Airport section sees the largest increase in PT mode share, increasing by 8 percentage points in both 2050 and 2065.

In 2065, the total passenger km travelled by Public Transport over the AM period increases by over 518,000 when the proposed Project is in place, resulting in a long-term Significant positive impact of the Project in both Scenario A and Scenario B. The largest journey time saving occurs from Swords Pavilions to Glasnevin, with a saving of approximately 40 minutes in all three years in Scenario A, equating to a reduction of 58% from the Do Minimum scenario. Similarly, the introduction of the proposed Project will cause reductions in bus usage.

Similarly, in both Scenario A and Scenario B, a reduction can be seen in the road distance travelled in the AM and PM periods when comparing the Do Minimum and Do Something scenarios, with the highest reduction of 3.7% in 2065 in Scenario A PM Peak Period.

Notable reductions in traffic flow will be seen along key routes south of Dublin Airport, including along the M50 Motorway, and along most radial routes into Dublin City Centre. National roads such as the N11, N7, N4, M3 and M2 also see reductions in traffic flows when the proposed Project is in place.

With the Park and Ride Facility in place, the results show that the Lissenhall Junction (North) is predicted to operate within capacity overall under the 2035 Do Something AM peak hour scenario. The M1 Southbound Off Ramp will increase from 72.0% in the Do Minimum scenario to 75.6% in the Do Something scenario, resulting in queues remaining consistent from 13 PCU to 12 PCU. The R126 Hearse Road will increase from 90.6% in the Do Minimum scenario to 106.3% in the Do Something scenario. The R132 Swords Road Southbound is expected to reach capacity in the Do Something Scenario, however the predicted queues do not reach as far back as the next junction. R132 Northbound is predicted to operate within capacity. Although the R132 Swords Road Southbound and R126 Hearse Road are predicted to experience a high degree of saturation during the AM peak hour, it is also expected that these will operate within acceptable saturation and queueing levels during the rest of the day.

The results show that the proposed Park and Ride accesses are predicted to operate within capacity during the AM peak hour 2035 Operational Phase. In the PM peak hour, the North Access Road exceeds practical capacity. Overall queue of 35 PCU (202m) is predicted on the R132 Southbound approach to the north junction, during the Weekday AM peak hour. The left entry lane from the new Park & Ride link road into the Park & Ride Facility is predicted to experience a queue of 14 PCU (79m).

In terms of car trips across the combined AZ geographical sections during the 12hr period, in Scenario A there is a reduction of 7,710 car trips between the 2035 Do Minimum and Do Something scenarios. In 2050, there is a reduction of 11,836 car trips between the Do Minimum and Do Something scenarios. In 2065, there is a reduction of 15,305 car trips between the Do Minimum and Do Something scenarios. AZ2 Airport section sees the largest reduction in car mode share during the 12hr period, with a decrease of 7 percentage points in both 2035 and 2050 and reducing by 8 percentage points in 2065.

In Scenario B during the 12hr period across the combined AZ geographical sections, there is a reduction of 6,825 car trips between the 2035 Do Minimum and Do Something scenarios. In 2050, there is a reduction of 10,923 car trips between the Do Minimum and Do Something scenarios. In 2065, there is a reduction of 11,032 car trips between the Do Minimum and Do Something scenarios. AZ2 Airport Section sees the largest reduction in car mode share during the 12h period, reducing by 7 percentage points in both 2050 and 2065.

There are long-term, Significant, positive impacts on the cycle network along the R132, where improvements will be made to the existing infrastructure, improving the level of Quality of Service along this route.

The impacts on pedestrian comfort levels across the network have been assessed in the 2018 Base scenario, and the 2050 and 2065 Scenario A. All scenarios have been assessed in the AM Peak Hour (08:00-09:00) for this analysis. Table 9.145 presents the links that face Significant impacts (pre mitigation) in the 2065 Scenario A, as the worst-case scenario for passenger demand when the proposed Project is operational. Possible mitigation measures for these links have been presented in Section 9.7.2.

At Glasnevin Station, during initial runs of the model, the model experienced saturation on the pedestrian crossing at the southern side of the R108/Whitworth Road junction. Within the model, this

crossing has been widened from 2m to 4m in width. This change has been sufficient to stop the model from locking up and it provides adequate capacity to accommodate forecast pedestrian demand in the 2035 and 2050 scenarios. These design changes are being put forward to be implemented in the Opening Year.

The model indicates that there is sufficient capacity for the transfer of passengers between the Project and DART services. Passengers are able to transfer between the platforms for these services without experiencing congestion or poor levels of service.

The Tara Street VisWalk microsimulation model demonstrates that the current design for the proposed station is expected to perform with an acceptable LOS. The proposed public plaza offers a high level of service regarding pedestrian routing.

The north side of Townsend Street experiences relatively high level of pedestrian demand, and therefore the proposed design to widen this footway to 6m (reducing Townsend Street east to one traffic lane towards Moss Street junction) facilitates improvements to pedestrian congestion and crossings at this location. At Townsend Street, the George's Quay LAP aims to promote Townsend Street 'as priority pedestrian routes providing connectivity between the city centre/retail core and the emerging cultural destination of Grand Canal Dock', and therefore any modifications to this location should be undertaken as a wholistic approach in line with this objective.

At R138 Burgh Quay and George's Quay West, the assessment utilised existing pedestrian infrastructure, and therefore does not account for the proposed upgrade to the public realm at this location as part of the planned mixed-use development at the corner of George's Quay and Tara Street. This impact may be reduced as a result of future developments in the area, in conjunction with the proposed Project proposals to the public realm.

With the new pedestrian infrastructure in place, the VisWalk microsimulation model at Charlemont indicates that R111 Grand Parade will have a Level B Level of Service overall, however at the location of the proposed pedestrian crossing the Level of Service is lower with 'some restriction in selection of walking speed and ability to pass others', this occurs as pedestrians are required to wait for a green phase at the signals. Overall, it is considered that the model displays an acceptable level of network performance in the assessment, and therefore is not included in Table 9.145.

Table 9.145: Links facing Significant Impact to Comfort Levels in 2065 Scenario A

Street Name	Station	DCC Base	TfL Base	DCC Metro	TfL Metro	VisWalk LOS	Impact	Description
R125 Pinnockhill	Swords Central	N/A	N/A	N/A	Unacceptable	N/A	Long-term, Significant, Negative	Insufficient Width for expected volume- 1m wide footway on one side of road only
L2300 Boroimhe Road	Fosterstown	N/A	N/A	N/A	Unacceptable	N/A	Long-term, Significant, Negative	Insufficient Width for expected volume on local road- possibility of relocation of space

Street Name	Station	DCC Base	TfL Base	DCC Metro	TfL Metro	VisWalk LOS	Impact	Description
R103 Glasnevin Avenue	Collins Avenue	No	Comfortable	No	Unacceptable	N/A	Long-term, Significant, Negative	Inappropriately placed bin, large grass verges

Table 9.146 presents a summary of the Significant negative impacts that have been identified in the Operational phase of the proposed Project. As demonstrated, these impacts are felt on both Pedestrians and Parking users along the proposed Project alignment. For Pedestrians, there is a Long-term Significant Negative on the comfort level of the associated footways at Fosterstown Station and Collins Avenue when the proposed Project is in place.

While there will be a loss of commercial and residential parking and loading infrastructure as a result of the proposed Project, the modal shift from road to public transport when the proposed Project is in place will reduce the overall demand on parking and loading facilities, thus reducing the severity of the impact. As a result, these have not been included in Table 9.146.

Table 9.146: Summary of Significant Negative Impacts identified in Operational Phase

Section	Link	User Group	Impact	Description
AZ1 Northern Section	R125 Pinnockhill	Pedestrians	Long Term Significant Negative	Uncomfortable' pedestrian comfort level – Scenario A, High sensitivity due to proximity to Airside Retail Park
	L2300 Boroimhe Road (2065)	Pedestrians	Long Term Significant Negative	Uncomfortable' pedestrian comfort level – Scenario A, High sensitivity due to proximity to Airside Retail Park
	R132 Swords Bypass (At Fosterstown Station)	Pedestrians	Long Term Significant Negative	Uncomfortable' pedestrian comfort level – Scenario B, High sensitivity due to proximity to Airside Retail Park
AZ4 Northwood to Charlemont Section	R103 Glasnevin Avenue (2065)	Pedestrians	Long Term Significant Negative	'Uncomfortable' pedestrian comfort level (From PCL A to PCL D)
	Whitworth Road	Pedestrians (Crossings)	Long Term Significant Negative (under existing design)	During initial model runs, this crossing fully saturates, however if widened to 4m then operates with sufficient capacity

9.7 Mitigation Measures

Mitigation measures refer to the proposed actions to be put in place to 'avoid, reduce, reduce, remedy or offset' the effect of Significant adverse impacts that are unable to be mitigated within the proposed Project design.

Chapter 31 (Summaries of the Route Wide Mitigation & Monitoring Proposed) provides further details of the necessary measures to mitigate adverse impacts.

9.7.1 Overview of Construction Phase

While there will inevitably be additional vehicular traffic during the Construction Phase of the proposed Project, this will be managed through the Outline Construction Environmental Management Plan (CEMP) and TTM Plans for the proposed Project and stations. The Outline CEMP provides a framework to:

- Describe the programme for environmental management during construction;

- Implement those monitoring and mitigation measures identified in the EIAR;
- Outline the principles and minimum standards required of the contractor during the development of the detailed CEMP (and associated Method Statements) and throughout construction;
- Identify the relevant roles and responsibilities for developing, implementing, maintaining and monitoring environmental management; and
- Outline the procedures for communicating and reporting on environmental aspects of the proposed development throughout construction.

The Outline CEMP contains details of HGV management and control measures, such as safety measures that should be on HGVS. In the event of approval being granted for the proposed Project and prior to commencement of works, the appointed contractor(s) which will be appointed by TII, will prepare a final detailed CEMP. Each Contractor will be required to have their own detailed CEMP.

The Outline CEMP (Appendix A5.1 of Chapter 5 (MetroLink Construction Phase)) will be a key part of the construction contract to ensure that all mitigation measures, which are considered necessary to protect the environment, prior to construction and during construction of the proposed Project, are fulfilled. These plans will be required to incorporate the material elements of the mitigation measures outlined in Chapter 31 (Summaries of the Route Wide Mitigation & Monitoring Proposed) of this EIAR.

The Traffic Management proposals have been developed to minimize construction impacts on pedestrians, cyclists and on the operation of bus services based on the principles of the road user hierarchy. (For example, where a lane is lost on a carriageway with a bus lane and two traffic lanes, the aim will be where possible, to maintain the bus lane for buses and cyclists and reduce the number of traffic lanes).

9.7.1.1 Construction Sustainability Mobility Plan

A Construction Sustainable Mobility Plan will be prepared to support and promote sustainable travel for construction staff travelling to and from the proposed Project site. The mobility plan is a management tool designed to encourage construction staff to rethink their travel choices and requirements during construction in order to minimize the adverse impacts on the environment and on the operation of the transport network within the city.

The Construction Sustainable Mobility Plan will be an active document that will require to be updated on a regular basis as construction activities take place and will present a series of measures designed to encourage travel to the constructions site(s) in a sustainable way.

9.7.1.2 Scheme Traffic Management Plan

The STMP (Appendix A9.5). details mitigation techniques and the types of measures to be employed to minimise the impacts generated by the proposed Project during the Construction Phase. The extent of the mitigation will be dependent on the severity of the impact. In some cases, mitigation may not be possible, and the impact will be described as residual.

There are two established strategies for impact mitigation which are used for the assessment in the STMP, namely reduction and remedial measures.

In general, strategic reduction mitigation occurs before construction, while remedial measures are implemented during construction on an on-going basis.

The reduction measures proposed, among others, include:

- A coordinated City Centre Traffic Management Plan, for all Project stations;
- Establishment of a Project Construction Traffic Forum- with representatives from key stakeholders;
- Construction vehicles will be controlled in terms of the hours of operation, and by imposing restriction on vehicle size and weight;
- Where practicable, construction work requiring short term disruption and road closures will be carried out when traffic volumes are lower, such as:

- At night;
- At weekends; and
- During school holidays.

The remedial measures proposed, among others, include:

- Wheel wash facilities will be provided at site specific locations if required;
- The numbers of employee vehicles travelling to and from construction sites on a daily basis will be managed through:
  - Car sharing; and
  - Transporting workers to site via min-buses from designated collection points (such as Luas and DART stations or other appropriate locations).

Table 9.147 presents a summary of the Moderate, or above, negative impacts in the Construction Phase and the associated mitigation measures proposed to reduce these impacts. These impacts will be removed following completion of the Construction Phase and therefore will not present residual impacts.

Table 9.147: Summary of Mitigation Measures in Construction Phase

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
AZ1 Northern Section				
Construction Phase	Public Transport (Enabling Works)	Short-term, Moderate, Negative – Removal of bus lanes on R132 and reduced capacity at Estuary Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Public Transport (Main Works)	Short-term, Moderate, Negative – Removal of eastbound bus lane on east arm of Malahide Junction-delay of 5mins	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Public Transport (Main Works)	Short-term, Moderate, Negative – closure of L2305 Nevinstown Lane impact on journey times and bus stops	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative – single lane removal in each direction on R132 at Estuary Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling	Short-term, Moderate,	Alternative routing has been identified for this section and will	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
	Works)	Negative- Lane loss on arms of Seatown Junction	be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative- Lane loss on arms of Malahide Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Significant, Negative- Loss of turning movements to and from R125 at Estuary Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Significant, Negative- Closure of Ennis Lane	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Significant, Negative- Reduced capacity on all arms of Seatown Junction, restriction of movements on Seatown Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Moderate, Negative- Realignment of Malahide Junction, reduced capacity on east arm	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Significant, Negative – Full closure of R125, reduced lanes at Pinnock Hill Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Significant, Negative- Closure	Alternative routing has been identified for this section and will be encouraged throughout the	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
		of southern arm of Pinnock Hill Junction	construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	
Construction Phase	General (Main Works)	Short-term, Significant, Negative- Closure of L2305 arm of Pinnockhill Junction	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General (Main Works)	Short-term, Significant, Negative- Closure of L2305 arm causing 1.4km diverion	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Cyclists (Main Works)	Short-term, Moderate, Negative – Removal of cycle lane on R132	Alternative routing has been identified for this section and will be encouraged throughout the construction phase to potentially reduce congestion by 30%- this will reduce conflict with cyclists. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative- Closure of Ennis Lane, 2.6km diversion for loading	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative- Loss of turning movements to and from R125 - 1.2km diversion for loading	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Significant Negative – 30% of parking spaces lost at Woodies	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative- Diversion of ~1.5km due to R125 south	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
		closure	removed following completion of Construction Phase.	
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative- loss of 20% of Travelodge parking	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative- L2305 closure causing 1.5km diversion for loading	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative- Loss of 10%-30% of parking at Airside Retail Park	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
AZ2 Airport Section				
Construction Phase	Pedestrians (Enabling and Main Works)	Short-term, Moderate, Negative- Removal of footway however diversion provided	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
AZ3 Dardistown to Northwood Section				
Construction Phase	General Traffic (Enabling and Main Works)	Short-term, Moderate, Negative- Delays of 4mins due to lane loss and speed restrictions on M50 Motorway	Monitor if closure/speed restriction is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling and Main Works)	Short-term, Moderate, Negative- R108 Ballymun Road/Santry Avenue reduction to 2 lanes increases flows by 25%	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling and Main Works)	Short-term, Significant, Negative - routeing profile takes several stations worth of site vehicles on R108	Coordinate spoil removal to minimize cumulative impact of HGV routing, Construction vehicles will be controlled in terms of the hours of operation (i.e. construction traffic may be prohibited during periods of very heavy traffic) This impact	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
		Ballymun Road	will be removed following completion of Construction Phase.	
Construction Phase	Cyclists (Enabling Works)	Short-term, Significant, Negative- Cycle lane on R108 Ballymun Road not replaced in Phase 3, cyclists to use general traffic lane	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
AZ4 Northwood to Charlemont Section				
Construction Phase	Public Transport (Enabling Works)	Short-term, Moderate, Negative – Removal of 90m of bus lane on Prospect Road- high sensitivity as BusConnects Spine Route	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Public Transport (Enabling Works)	Short-term, Moderate, Negative – Hume Street bus stops not in use, alternative stops up to 300m away. High sensitivity in Dublin City Centre	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Public Transport (Main Works)	Short-term, Significant, Negative- Closure of Western Commuter Line Maynooth to Docklands for up to 21 months	Closure will either be one long-term closure for 21 months, or two separate closures of 3 months and 16 months respectively. Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided to direct affected passengers to other modes . This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Public Transport (Main Works)	Short-term, Significant, Negative- Closure of South Western Commuter Line Maynooth and Phoenix Park to Connolly for up to 5 months	Closure will either be for 5 months or for 1 months, depending on contracting processed. Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided to direct affected passengers to other modes . This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
Construction Phase	Public Transport (Main Works)	Short-term, Moderate, Negative – Closure of Eccles Street to general traffic, redistributes traffic to surrounding local roads and delays bus journeys	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative – Removal general traffic lane on R108	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative – Reduced capacity on R108, increased delays and traffic flows	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative- Local Access to Albert College Court diversion of 750m	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative – Temporary shuttle signals on Berkeley Road, 42% increase in flows	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Moderate, Negative – Closure of Hume Street will increase traffic flows and driver delays	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling Works)	Short-term, Significant, Negative – Closure of Hume Street causes 900m diversion for local access	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Enabling and	Short-term, Moderate,	Monitor if closure is required at all points, or if it can be reinstated	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
	Main Works)	Negative – Closure of Dartmouth Road, impact on flows and delays	temporarily throughout the works. This impact will be removed following completion of Construction Phase.	
Construction Phase	General Traffic (Main Works)	Short-term, Significant, Negative- Junction operating over capacity at R108/R103	This impact will be removed following completion of Construction Phase. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Main Works)	Short-term, Moderate, Negative- Local access to Albert College Court is diverted by 750m	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Main Works)	Short-term, Significant, Negative- Restricted access to Eccles Street in Phase 2 and Phase 3	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic and Parking and Loading (Main Works)	Short-term, Moderate, Negative – Road closure along Luke Street, 500m diversion	Appropriate signage will be provided. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	General Traffic (Main Works	Short-term, Moderate, Negative – Closure of Dartmouth Road, impact on flows and delays	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Pedestrians (Enabling and Main Works)	Short-term, Moderate, Negative – Partial closure of R802 Tara Street and Poolbeg Street footways for 2 months	An alternative route will be designated, be clearly visible, be safe and be signed and have the level of service required to cater for the pedestrian demand. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Pedestrians (Main Works)	Short-term, Moderate Negative – Increased journey time length for residents in Albert College Court	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Pedestrians and Cyclists	Short-term, Moderate, Negative- Partial	An alternative route will be designated, be clearly visible, be safe and be signed and have the	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
	(Main Works)	closure of Royal Canal Way, 300m diversion	level of service required to cater for the pedestrian demand. This impact will be removed following completion of Construction Phase.	
Construction Phase	Pedestrians (Main Works)	Short-term, Significant, Negative- Closure of Luke Street footway for duration of work	An alternative route will be designated, be clearly visible, be safe and be signed and have the level of service required to cater for the pedestrian demand. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Pedestrians (Main Works)	Short-term, Significant, Negative- Footway reductions on Tara Street and Townsend Street	An alternative route will be designated, be clearly visible, be safe and be signed and have the level of service required to cater for the pedestrian demand. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Cyclists (Main Works)	Short-term, Moderate, Negative – R108 St Mobhi Road Southbound cyclists required to use general traffic lane, Secondary Route	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Appropriate signage will be provided to ensure road users are aware of presence of cyclists. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Cyclists (Main Works)	Short-term, Moderate, Negative – Removal of Dublin Bikes in Mater Phase 1	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Will be reinstated after completion of Phase 1. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Cyclists (Enabling and Main Works)	Short-term, Moderate, Negative – Road closure along Luke Street, diversion required	An alternative route will be designated, be clearly visible, be safe and be signed and have the level of service required to cater for the cycle demand. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Cyclists (Enabling and Main Works)	Short-term, Moderate, Negative – Road closure along Dartmouth Road, diversion required	An alternative route will be designated, be clearly visible, be safe and be signed and have the level of service required to cater for the cycle demand. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Cyclists (Main Works)	Short-term, Moderate, Negative – Removal of	Monitor if closure is required at all points, or if it can be reinstated temporarily throughout the works. Will be reinstated after completion.	Short-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
		DublinBikes station, high sensitivity Dublin City Centre	This impact will be removed following completion of Construction Phase.	
Construction Phase	Cyclists (Main Works)	Short-term, Moderate, Negative – realignment of cycle lanes on Grand Parade, increase conflict with site access vehicles	There will be controls at the entrance/exits of sites for construction vehicles in order to ensure the safety of other road users. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (Enabling and Main Works)	Short-term, Moderate, Negative – Removal of 15 spaces on Hume Street	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (main Works)	Short-term, Significant, Negative – Loss of 42 spaces at Albert College	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (main Works)	Short-term, Moderate, Negative – 17 spaces lost on Berkeley Road	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative
Construction Phase	Parking and Loading (main Works)	Short-term, Moderate, Negative – 20 parking spaces lost on Eccles Street, removed taxi bays and relocation of taxi rank	Monitor if closure is required at all points, or if spaces can be reinstated temporarily throughout the works. Taxi rank to be relocated in coordination with DCC. This impact will be removed following completion of Construction Phase.	Short-term, Slight, Negative

9.7.1.2.1 Construction Phase Monitoring

Throughout the Construction Phase, ongoing monitoring will be required of the specified HGV haul routes, particularly in relation to those affected by the HGV Restricted Zone within Dublin City Centre.

As identified in section 9.7.1.2, monitoring of hours of operation and vehicle size and weight will also be required.

9.7.2 Overview of Operational Phase

It is anticipated that, overall, the proposed Project will provide for improvements to the public transport network, resulting in decreases in car usage/trips (with the exception of trips being made to and from the Park and Ride Facility), increases in public transport usages, and will facilitate walking and cycling to the stations, without significantly impacting on the operation of the networks in the area. Table 9.148 presents a summary of the Moderate, or above, negative impacts in the Operational Phase and the associated mitigation measures proposed to reduce these impacts. There may be a requirement for further work in conjunction with FCC and DCC to determine full effective mitigation measures, such as reconfiguration of street furniture or reallocation of space to maximise available width.

Table 9.148: Summary of Mitigation Measures in Operational Phase

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
Fosterstown				
Operational	Pedestrians -Comfort Level	Long-term, Significant, Negative impact on L2300 in 2065 – Uncomfortable pedestrian comfort level	Consider placement of street furniture to maximise available width, monitor comfort levels and demand to determine if footway width needs increased in Future Years- possibility of reallocation of grass verges at this location to increase footpath width	Long-term, Moderate, Negative- post mitigation assessment detailed below
Operational	Pedestrians Comfort Level	Long-term, Moderate, Negative impact on R132 in Scenario A 2065 – Acceptable pedestrian comfort level	Consider placement of street furniture to maximise available width, monitor to determine if footway width needs increased in Future Years	Long-term, Slight, Negative
Operational	Pedestrians Comfort Level	Long-term, Significant, Negative impact on R132 in Scenario B2065 – Uncomfortable pedestrian comfort level	Consider placement of street furniture to maximise available width, monitor to determine if footway width needs increased in Future Years	Long-term, Moderate, Negative
Collins Avenue				
Operational	Pedestrians – Comfort Levels	Long-term, Significant, Negative to Glasnevin Avenue	Consider placement of street furniture to maximise available width. Monitor impacts to determine if further width is required	Long-term, Moderate, Negative - post mitigation assessment detailed below
Operational	Pedestrians - Comfort Levels	Long-term, Moderate, Negative at Ballymun Road (south of station)	Consider placement of street furniture to maximise available width. Monitor impacts to determine if further width is required	Long-term, Slight, Negative
Glasnevin				
Operational	Pedestrian Crossing	Long-term Significant Negative impact to comfort	If pedestrian crossing is widened to 4m, the crossing will operate with sufficient comfort levels for the	Long-term, Slight, Negative

Stage	Assessment Topic	Predicted Impact (Pre-Mitigation and Monitoring)	Mitigation Measure	Predicted Residual Impact (Post Mitigation and Monitoring)
		of crossing at Whitworth Road	anticipated demand. Design team have confirmed this mitigation can be accommodated.	
Mater				
Operational	Pedestrians -Comfort Levels	Long-term, Moderate, Negative North Circular Road	Consider placement of street furniture to maximise available width. Monitor impacts to determine if further width is required	Long-term, Slight, Negative
O'Connell Street				
Operational	Pedestrians- Comfort Levels	Long-term, Moderate, Negative Parnell Street West	Consider reallocation of road space to widen the pedestrian area.	Long-term, Slight, Negative
Tara Street				
Operational	Pedestrians -Comfort Levels	Long-term, Moderate, Negative impact to R138 West, George's Quay West	Consider placement of street furniture to maximise available width. Monitor impacts to determine if further width is required	Long-term, Slight, Negative
Operational	Pedestrians -Comfort Levels	Long-term, Moderate, Negative impact to Townsend Street East	Consider placement of street furniture to maximise available width. Monitor impacts to determine if further width is required	Long-term, Slight, Negative
Charlemont				
Operational	Pedestrians – Comfort Levels	Long-term, Moderate, Negative impact to Charlemont Street and Grand Parade West	Consider placement of street furniture to maximise available width. Monitor impacts to determine if further width is required	Long-term, Slight, Negative

At Fosterstown Station, the current width of the footway (total across both sides of the road) on L2300 Boroimhe Road is insufficient for the maximum expected volume of pedestrians at this location. However, with reallocation of the current grass verges at this location would allow for an increase of total footway width to 4m, which would give an 'Acceptable' pedestrian comfort level.

Similarly, at Collins Avenue Station, following reconfiguration of the existing street furniture, the pedestrian comfort level improves to an 'Acceptable' rating.

9.7.2.1 Operational Phase Monitoring

The use of the Park and Ride Facility at Estuary Station will need to be monitored through the Operational Phase. Data on the origins and destinations of users, and their trips will be required to determine what impact the Park and Ride Facility is having on local and strategic level trips. Further demand management measures may be required in order to increase the number of spaces available to the wider catchment.

The cycle parking provisions per station will be required to be monitored to ensure that the level of provisions is meeting the demand. Similarly, the type of cycle parking provisions required may change

over the course of the Operational Phase due to the ongoing shift to shared and micro mobility solutions.

Pedestrian comfort levels will be required to be monitored throughout the Operational Phase to ensure that the surrounding footways have the capacity to maintain acceptable comfort levels with increasing demand. 'Uncomfortable' and 'Acceptable' links identified in the assessment are to be monitored to ensure that maximum available width is provided through the monitoring of street furniture placement and total footpath width, where applicable.

9.8 Residual Impacts

With the implementation of the specified mitigation measures in Section 9.7, all Significant negative impacts in the Operational Phase will be reduced to Moderate or Slight negative. However, residual impacts will remain during the Construction Phase as a result of the TTM measures, however following the completion of the Construction Phase these residual impacts will be removed.

9.8.1 Construction Phase

9.8.1.1 Overview

Chapter 5 (MetroLink Construction Phase) details the construction activities required to deliver the proposed Project. It also identifies the principles of the traffic management measures which will be implemented in order to mitigate and monitor the associated construction traffic impact.

The extent of the construction activities causes some impacts that remain when the TTM proposals are in place. The STMP details the residual impacts at each of the sites during the Construction Phase, such as reduced capacity on the road network leading to increased flows and driver delay, and residual impact on bus journey times as a result of the associated traffic management proposals.

9.8.1.2 General Traffic Impact

TTM measures have been developed to minimize the impact on general traffic and ensure the smooth operation of traffic throughout the works areas, as best as possible. Temporary traffic diversions will be implemented where partial or full road closures are required and through traffic needs to be accommodated. HGV vehicle volumes have been assessed, and some sections of the proposed Project will face temporary Significant negative impacts as a result, despite traffic management measures being implemented. These significant impacts are at a local level, particularly in the AZ1 Northern Section, whereas the overall impact on the strategic network is short-term Slight negative.

9.8.1.3 Pedestrian Impact

Temporary management measures have been developed to minimize the impact on pedestrians and ensure the quality and ease of pedestrian movements throughout the works areas, as best as possible. The STMP has utilised a hierarchy of local impact mitigation, with Pedestrians and Cyclists (Vulnerable Users) taking priority for protection. Temporary pathways will be installed where appropriate and provisions will be made to ensure access for the mobility impaired is maintained. Where necessary, pedestrian crossings will be provided to facilitate safe crossing throughout the works and negate any conflict with associated construction vehicles. Residual impacts to pedestrians are also seen at Glasnevin and Tara Street.

9.8.1.4 Cycling Impact

Temporary management measures have been developed to minimize the impact on cyclists and ensure the quality and ease of cyclist movements throughout the works areas. Temporary cycle lanes will be installed where appropriate and provisions will be made to ensure safe and direct routes are maintained. Residual impacts will also remain at Glasnevin and along the R108 Ballymun Road.

9.8.1.5 Public Transport Impact

Temporary management measures have been developed to minimize the impact on bus users. Where feasible, the early delivery of bus-gates and other bus priority measures will reduce the negative effect of roadworks on bus journey times. Access to bus stops will be maintained with temporary bus stop relocations agreed in advance with public transport providers. However, residual impacts remain on bus journey times due to local diversions at some locations. Residual impacts to the public transport network will occur at Glasnevin with the closure of the Western Commuter Line and South Western Commuter Line.

9.8.1.6 Parking and Loading Impact

Temporary management measures have been developed to minimize the impact on parking and loading. Site specific mitigation measures will be developed through consultation with stakeholders, including local authorities, residents and business owners. These impacts should be monitored throughout the Construction Phase to assess if any disrupted bays can be reinstated.

9.8.1.7 Summary of Construction Phase Impacts

As noted in Section 9.6.1.3 Construction Phase Summary, the Significant negative impacts identified in the Construction phase of the proposed Project are residual impacts of the TTM measures, and therefore they will be removed once the construction phase is complete. As such, further mitigation measures are not required, and these impacts will not be felt when the proposed Project is operational.

Table 9.149: Summary of Residual Impacts during Construction Phases (Temporary in the Construction Phase)

Section	Link	User Group	Impact	Description	Mitigation Measure	Residual Impact
Enabling Works						
AZ1 Northern Section	Seatown Junction	Parking and Loading	Short-term Significant Negative	Diversion of access of approx 2.5km to 3.5km and loss of 30% of spaces at Woodies	Not required as will be removed once construction phase is complete	N/A – All Impacts will be removed once construction phase is complete
AZ3 Dardistown Depot to Northwood Section	R108 Ballymun Road (Northwood)	General Traffic	Short-term Significant Negative	HGV routeing profile takes several stations worth of site vehicles through this area		
	R108 Ballymun Road Realignment-	Cyclists	Short-term Significant Negative	Removal of southbound cycle facility during phase 3. Cycle lane/ways provided in other phases. cycle facility not replaced in Phase 3, requirement to use traffic lane		
AZ4 Northwood to Charlemont Section	Poolbeg Street	Pedestrians	Short-term Significant Negative	2-month Closure of footway causing diversion for pedestrians		
	Hume Street – Local Access	General Traffic	Short-term Significant Negative	Closure of Hume Street and 900m diversion via Pembroke Street and Leeson Street		
Main Works						
AZ1 Northern	Estuary Junction	General Traffic	Short-term Significant	Loss of turning movements to and from the R125 (west) junction	Not required as will be	N/A – All Impacts will be removed

Section	Link	User Group	Impact	Description	Mitigation Measure	Residual Impact
Section			Negative	arm	removed once construction phase is complete	once construction phase is complete
	Ennis Lane	General Traffic	Short-term Significant Negative	Closure of Ennis Lane, which links the R132 to Balheary Road		
	Seatown Junction and Station	General Traffic	Short-term Significant Negative	Reduced capacity on all arms of Seatown Junction including the loss of turning movements to and from Seatown Road (East) junction arm		
	R125 Airside Retail Park	General Traffic	Short-term Significant Negative	Full closures of the R125 south arm during Main Work. Reduced general traffic lane on R132 southbound on approach to junction and R132 northbound on approach to junction. Results in 74% increase in traffic volume on R132 southbound between Pinnock Hill Junction and Nevinstown Junction		
	Nevinstown Junction	General Traffic	Short-term Significant Negative	Closure of southern arm at Pinnockhill Junction results in 1.5km diversion		
	Nevinstown Junction	General Traffic	Short-term Significant Negative	Closure of L2305 arm. Existing 4 arm junction reduced to 3 arms, with a left-out slip onto R132 southbound, south of the junction		
	L2305 Nevinstown Lane	General Traffic	Short-term Significant Negative	Closure of L2305 causing approx. 1.4km diversion to Pinnock Hill Junction/Airside Junction		
	Seatown Junction	Parking and Loading	Short-term Significant Negative	Diversion of access of approx 2.5km to 3.5km and loss of 30% of spaces at Woodies		
AZ3 Dardistown Depot to Northwood Section	R108 Ballymun Road	General Traffic	Short-term Significant Negative	HGV routeing profile takes several stations worth of site vehicles through this area		
AZ4 Northwood to Charlemont Section	Western Commuter Line Maynooth to Docklands	Public Transport	Short-term Significant Negative	Closure for 21 months		
	South Western Commuter	Public Transport	Short-term Significant Negative	Closure for 5 months		

Section	Link	User Group	Impact	Description	Mitigation Measure	Residual Impact
	Line Maynooth and Phoenix Park to Connolly					
	R108 Ballymun Road /R103 Collins Avenue Junction	General Traffic	Short-term Significant Negative	Increase in traffic flow due to diverted local traffic and increase in HGVs, junction will operate over capacity		
	Mater-Phase 2 and 3 (Berkeley Road)	General Traffic	Short-term Significant Negative	Restricted access to Eccles Street from Berkeley Road, increase of 17% traffic flow on Berkeley Road		
	Royal Canal Way	Pedestrians	Short-term Significant Negative	Partial closure of Royal Canal Way, however diversion provided and new bridge (Diversion of over 500m)		
	Luke Street	Pedestrians	Short-term Significant Negative	Full closure of footway for the duration of works		
	Albert College	Parking and Loading	Short-term Significant Negative	Loss of 42 spaces (42% of public parking within 200m)		

9.8.2 Operational Phase

9.8.2.1 Overview

In the Operational Phase of the proposed Project, there will be a limited number of negative impacts. Following the implementation of the specified mitigation measures, a number of the identified potential Moderate and Significant impacts will remain, as identified in Section 9.8.2. In particular, many of the residual impacts are in relation to the pedestrian comfort level of the associated footways with the anticipated passenger demand.

9.8.2.2 General Traffic Impact

In the Operational Phase of the proposed Project, there is an increase in traffic flow in both directions to the north of Swords in all Future Years. This can be expected due to traffic travelling to the Strategic Park and Ride site at Estuary and causes residual impacts in this area. However, as a result of the Park and Ride Facility, there is a general decrease in traffic between Swords and Dublin City Centre.

9.8.2.3 Pedestrian Impact

Overall, the proposed Project will contribute to positive impacts on pedestrians by improving the public transport network around various locations, which will encourage more active modes trips to and from the stations. Long-term, Moderate, negative impacts remain on the pedestrian comfort level of L2300 at Fosterstown Station and R103 Glasnevin Avenue at Collins Avenue, and therefore future coordination may be required with FCC and DCC to determine further mitigation, such as the reallocation of space. At Glasnevin and Tara Street, residual impacts occur in the current designs, however with the provision of additional pedestrian infrastructure, the pedestrian network will be sufficient to accommodate the

anticipated demand. These design changes are being put forward to be implemented in the Opening Year.

9.8.2.4 Cycling Impact

Station designs include improvements to the cycle network in the immediate vicinity of stations to facilitate active modes travel to and from the stations. As a result, there will be positive residual impacts to cyclists during the Operational Phase. At all stations, the quality of service for cyclists either has no change, or it improves with the provision of improved cycling infrastructure.

9.8.2.5 Public Transport Impact

In the Operational Phase, the proposed Project will have a number of Significant positive impacts on public transport journey times across the GDA beyond the proposed Project alignment. Throughout the Design Years, these journey time savings will increase, resulting in greater positive impacts to public transport. Public transport mode share will also increase as a result of the proposed Project. In the absence of improvements on other public transport corridors, the increase in passenger flows on some of the other public transport corridors will result in some overcrowding. This is evident in Scenario A, but not in Scenario B, due to the presence of the improvements included within the Do Minimum scenario for Scenario B.

9.8.2.6 Parking and Loading Impact

There will be no negative residual impacts to parking and loading during the Operational Phase of the Project.

9.8.2.7 Operational Phase Summary

Overall, the proposed Project will provide a range of long-term positive impacts, from Slight to Profound. The Significant and Profound positive impacts will be on the public transport network, with vast improvements to public transport journey times, increases in the mode share held by public transport, and improvements to interchange opportunities. Whilst there may be some additional car trips made on the M1 and surrounding links as a result of the presence of the Park and Ride facility, there will be an overall net decrease in car trips and traffic flows on the road network.

With the appropriate mitigation measures applied, there will be no Long-term Significant Negative impacts on any user during the Operational Phase. Long-term Slight Negative impacts remain on pedestrians as a result of the reduction in comfort levels associated with the increased volume of passengers on the surrounding footways. Table 9.150 presents a summary of the predicted residual impacts during the Operational Phase of the proposed Project. With continued monitoring of pedestrian comfort around the stations in relation to the placement of street furniture and footway widths, these impacts can be reduced further where necessary, however the comfort levels are deemed 'Acceptable' on all links.

Table 9.150: Summary of Predicted Residual Impacts in Operational Phase

Station	Assessment Topic	Link	Predicted Residual Impact (Post Mitigation and Monitoring)	Description of Residual Impact
Fosterstown	Pedestrians -Comfort Level	L2300 Boroimhe Road	Long-term, Moderate, Negative	Current width of footway is insufficient for expected volume of passengers- reallocation of grass verges would improve to 'Acceptable' comfort level/ Long-term Slight Negative Impact
	Pedestrians -Comfort Level	R132 Swords Bypass	Long-term, Moderate, Negative	Current width of footway is insufficient for expected volume

Station	Assessment Topic	Link	Predicted Residual Impact (Post Mitigation and Monitoring)	Description of Residual Impact
				of passengers in Scenario B
Collins Avenue	Pedestrians – Comfort Levels	Glasnevin Avenue	Long-term, Moderate, Negative- post mitigation assessment detailed below	Reconfiguration of the existing street furniture will improve comfort level to 'Acceptable'/Long term Slight Negative Impact
	Pedestrians - Comfort Levels	R108 Ballymun Road (South of station)	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
Glasnevin	Pedestrians - Crossings	Whitworth Road	Long-term, Slight, Negative	If crossing is widened to 4m then sufficient capacity to accommodate anticipated demand. Design team have confirmed there is space for this to be accommodated but has not been incorporated into designs at present
Mater	Pedestrians -Comfort Levels	North Circular Road	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
O'Connell Street	Pedestrians-Comfort Levels	Parnell Street	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
Tara Street	Pedestrians -Comfort Levels	Burgh Quay West	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
	Pedestrians -Comfort Levels	George's West	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
	Pedestrians -Comfort Levels	Townsend Street East	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
Charlemont	Pedestrians – Comfort Levels	Charlemont Street	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines
	Pedestrians – Comfort Levels	Grand Parade West	Long-term, Slight, Negative	'Acceptable' comfort level, however below DCC guidelines

9.9 Glossary

Term	Meaning
Alignment	Alignment refers to the three dimensional (3D) route of the railway, considering both the horizontal and vertical alignment.
Arterial street	Major route, via which major centres are connected. May also include orbital or cross metropolitan routes within cities and larger towns.
Business Park	Areas primarily focused on providing areas of commercial and industrial activity outside of Centres
Centre	Areas that are the focus of economic and cultural activity
Enabling Works	These are works to prepare a site in advance of the main Construction Phase, for example, demolition, removal of vegetation, land levelling.
Link street	Route that provides the links to the arterial streets or between centres, neighbourhoods and/or suburbs
Local street	Route that provides access within communities and to arterial and link streets
Neighbourhood	Areas intensively developed with medium to higher density housing and/or contain a broad mix of uses
Park & Ride Facility	A location usually sited out of the main urban areas comprising a large car park and connected with a mass transit system, in the case of metrolink an urban metro to attract potential travellers to drive and park at the facility and take the metro into the city centre and avoid driving into the city centre.
Suburb	Predominantly consist of existing lower density housing developed over expansive areas
Surface Station	A railway station designed at ground level
Underground Stations	A railway station located fully underground with a roof slab over the station to enclose it fully.
Vulnerable users	Non-motorised road users, such as pedestrians and cyclists as well as motorcyclists and people with disabilities or reduced mobility and orientation

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